***Fort Bend County, Texas***
***Request for Proposals***

***Construction of Justice Center Courtroom***
***for Fort Bend County***
***RFP 25-017***

**SUBMIT SEALED PROPOSALS TO:**

**Fort Bend County**
**Purchasing Department**
**Travis Annex**
**301 Jackson, Suite 201**
**Richmond, TX 77469**

****NOTE:**
**All correspondence must include the term "Purchasing Department" in address to assist in proper delivery**

**SUBMIT NO LATER THAN:**

**Tuesday, November 19, 2024**
**2:00 PM (Central)**

**LABEL ENVELOPE:**

**RFP 25-017**
**Construction of JC Courtroom**

***ALL SUBMITTALS MUST BE RECEIVED AND TIME/DATE STAMPED BY THE PURCHASING OFFICE OF FORT BEND COUNTY ON OR BEFORE THE SPECIFIED TIME/DATE STATED ABOVE.***

***SUBMITTALS RECEIVED AS REQUIRED WILL THEN BE OPENED AND THE NAMES PUBLICLY READ.***

***SUBMITTALS RECEIVED AFTER THE SPECIFIED TIME WILL BE RETURNED UNOPENED.***

Results will not be given by phone.
Results will be provided to bidder in writing after Commissioners Court award.

Requests for information must be in writing and directed to:
Melissa Stavinoha
Senior Buyer
Melissa.Stavinoha@fortbendcountytx.gov

**Vendor Responsibilities:**

- Download and complete any addendums. (Addendums will be posted on the Fort Bend County website no Later than 48 hours prior to bid opening)
- Submit response in accordance with requirements stated on the cover of this document.
- DO NOT submit responses via email or fax.

Prepared: 10/09/2024
Issued: 10/20/24

**COUNTY PURCHASING AGENT**
**Fort Bend County, Texas**

# Vendor Information

Jaime Kovar
Purchasing Agent
Office (281) 341-8640

| | | | |
|---|---|---|---|
| Legal Company Name (top line of W9) | | | |
| Business Name (if different from legal name) | | | |
| Type of Business | ☐ Corporation/LLC ☐ Partnership<br>☐ Sole Proprietor/Individual ☐ Tax Exempt | | Age in Business? |
| Federal ID # or S.S. # | | SAM.gov Unique Entity ID # | |
| SAM.gov CAGE / NCAGE | | | |
| Publicly Traded Business | ___ No ___ Yes Ticker Symbol _____ | | |
| Remittance Address | | | |
| City/State/Zip | | | |
| Physical Address | | | |
| City/State/Zip | | | |
| Phone Number | | | |
| E-mail | | | |
| Contact Person | | | |
| Check all that apply to the company listed above and provide certification number. | DBE-Disadvantaged Business Enterprise ☐<br>SBE-Small Business Enterprise ☐<br>HUB-Texas Historically Underutilized Business ☐<br>WBE-Women's Business Enterprise ☐ | **Certification #** _____<br>**Certification #** _____<br>**Certification #** _____<br>**Certification #** _____ | Cert Date / Exp Date<br>_____ _____<br>_____ _____<br>_____ _____<br>_____ _____ |
| Company's gross annual receipts | <$500,000 _____ | $500,000-$4,999,999 _____ | |
| | $5,000,000-$16,999,999 ___ | $17,000,000-$22,399,999 _____ | >$22,400,000 _____ |
| NAICs codes (Please enter all that apply) | | | |
| Signature of Authorized Representative | | | |
| Printed Name | | | |
| Title | | | |
| Date | | | |

**THIS FORM MUST BE SUBMITTED WITH THE SOLICITATION RESPONSE**

## 1.0 SCOPE OF WORK:

Fort Bend County, Texas (hereafter referred to as the "County") seeks Sealed Proposals ("Proposals or RFP") for selection of a Contractor ("Respondent") to complete the construction of the Justice Center Courtroom finish-out ("Project"), located in Richmond, Texas. The scope includes the light demolition of three future courtroom shell space areas. Vendor is to construct the complete finish-out of three new courtrooms, approximately 16,750 square feet, including extensive custom millwork, fabric sound panels, audio / visual systems, and all other typical requirements such as electrical, mechanical ductwork, lighting, paint, carpet, etc. Also included will be the construction of a new security core that serves the courtrooms, including an added elevator stop and two holding cells that conform to current Jail Commission Standards. This will be an occupied facility throughout the renovation, so some accommodations will be required at times to control excessive construction noise.

## 2.0 GUIDELINES:

By virtue of submitting a proposal, interested parties are acknowledging:

2.1 The County reserves the right to reject any or all proposals if it determines that select proposals are not responsive to the RFP. The County reserves the right to reconsider any proposal submitted at any phase of the procurement. It also reserves the right to meet with select Respondents at any time to gather additional information. Furthermore, the County reserves the right to delete or add scope up until the final contract signing.

2.2 All Respondents submitting proposals agree that their pricing is valid for a minimum of ninety (90) days after proposal submission to the County. Furthermore, the County is by statute exempt from the State Sales Tax and Federal Excise Tax; therefore, proposal prices shall not include taxes.

2.3 This Proposal does not commit the County to award nor does it constitute an offer of employment or a contract for services. Costs incurred in the submission of this proposal, or in making necessary studies or designs for the preparation thereof, are the sole responsibility of the Respondents. Further, no reimbursable cost may be incurred in the anticipation of award. Proposals containing elaborate artwork, expensive paper and binding and expensive visual or other presentations are neither necessary nor desired.

2.4 In an effort to maintain fairness in the process, all inquiries concerning this procurement are to be directed only to the County's Purchasing Agent in writing. Attempts to contact any members of the County's Commissioners' Court or any other County employee to influence the procurement decision may lead to immediate elimination from further consideration.

2.5 When responding to this Proposal, follow all instructions carefully. Submit proposal contents according to the outline specified and submit all hard copy and

electronic documents according to the instructions. Failure to follow these instructions may be considered a non-responsive proposal and may result in immediate elimination from further consideration.

## 3.0 PROPOSAL CONTACT:

This Proposal is being issued by the County Purchasing Agent on behalf of Fort Bend County, Texas. Thus, responses should be directed to the Purchasing Agent, as outlined below. **Respondents are specifically directed NOT to contact any County personnel for meetings, conferences or technical discussions that are related to this Proposal other than specified herein. Unauthorized contact of any County personnel will likely be cause for rejection of the Respondent's proposal. All communications regarding the Proposal shall be directed to the County's Proposal Contact.** Communication with the Proposal Contact is permitted via email, facsimile, or written correspondence.

**PROPOSAL CONTACT:**

Melissa Stavinoha
Senior Buyer
Fort Bend County Travis Annex
301 Jackson, Suite 201
Richmond, Texas 77469
Melissa.Stavinoha@fortbendcountytx.gov

## 4.0 SUBMISSION REQUIREMENTS:

4.1 Submission requirements: one (1) original proposal, five (5) paper copies, and one (1) electronic response on flash drive are required by RFP opening time of **2:00 PM on Tuesday, November 19, 2024**. Flash drive must contain only one (1) file in PDF format and must match written response identically. Failure to provide proper flash drive is cause for disqualification. Proposal shall be submitted to the address shown below. Proposal shall be signed, in ink, by a person having the authority to bind the firm in a contract.

| | |
|---|---|
| Fort Bend County | Proposal Number: R25-017 |
| Purchasing Department | Due Date: November 19, 2024 |
| 301 Jackson, Suite 201 | Time: 2:00 PM (CST) |
| Richmond, Texas 77469 | For: Construction of JC Courtroom |

4.2 Respondents may submit their proposal any time prior to the Opening Date and time. The Respondent's name and address as well as a distinct reference to the Proposal number above shall be marked clearly on the submission. All proposals are time-stamped upon receipt and are securely kept, unopened, until the Opening Date. No responsibility will attach to the County, or any official or employee thereof, for the pre-opening of, post-opening of, or the failure to open a proposal not properly addressed and identified. No oral, telegraphic, telephonic, or facsimile proposals will be considered.

4.3 Proposals may be modified or withdrawn prior to the established opening date by delivering written notice to the proposal contact. Any alteration made prior to opening date and time shall be initialed by the signer of the proposal, guaranteeing authenticity.

4.4 Proposals time-stamped after the due date and time will not be considered and will be returned to the Respondent unopened. Regardless of the method used for delivery, respondents shall be wholly responsible for the timely delivery of submitted proposals.

4.5 The Respondent's name and address shall be clearly marked on all copies of the proposal.

## 5.0 INCURRED COSTS:

Those submitting proposals do so entirely at their expense. There is no expressed or implied obligation by the County to reimburse any individual or firm for any costs incurred in preparing or submitting proposals, for providing additional information when requested by the County or for participating in any selection interviews, including discovery (pre-contract negotiations) and contract negotiations.

## 6.0 ACCEPTANCE:

6.1 Submission of any proposal indicates a Respondent's acceptance of the conditions contained in this Proposal unless clearly and specifically noted otherwise in their proposal.

6.2 Furthermore, the County is not bound to accept a proposal on the basis of lowest price, and further, the County has the sole discretion and reserves the right to cancel this Proposal, to reject any and all proposals, to waive any and all informalities and or irregularities, or to re-advertise with either the identical or revised specifications, if it is deemed to be in the County's best interests. The County reserves the right to accept or reject any or all of the items in the proposal, and to award the contract in whole or in part and/or negotiate any or all items with individual Respondents if it is deemed in the County's best interest.

6.3 Although Fort Bend County desires to negotiate toward a contract with a selected Respondent, the Commissioners' Court may award the contract on the basis of the initial proposals received, without discussions. Therefore, each initial proposal should contain the Respondent's best terms.

## 7.0 INTERPRETATIONS, DISCREPANCIES, AND OMISSIONS:

7.1 It is incumbent upon each potential Respondent to carefully examine these specifications, terms, and conditions. Should any potential Respondent find

discrepancies, omissions or ambiguities in this Proposal, the Respondent shall at once request in writing an interpretation from the County's Proposal Contact. Any inquiries, suggestions, or requests concerning interpretation, clarification or additional information shall be made in writing via e-mail only to the County's Proposal Contact, as specified in Section 3.0. Deadline for submission of questions and/or clarification is **Tuesday, November 12, 2024 at 10:30 AM. (CST).** Requests received after the deadline will not be responded to due to the time constraints of this Proposal process.

7.2 The issuance of a written addendum is the only official method by which interpretation, clarification or additional information will be given by the County. Only questions answered by formal written addenda will be binding. Oral and other interpretations or clarification will be without legal effect. If it becomes necessary to revise or amend any part of this Proposal, notice will be given by the County Purchasing Agent to all prospective Respondents who were sent a Proposal. The Respondent in their proposal shall acknowledge receipts of amendments. Each Respondent shall ensure that they have received all addenda and amendments to this Proposal before submitting their proposals.

## 8.0 TENTATIVE SCHEDULE:

| | |
|---|---|
| Release of RFP: | October 20, 2024 |
| Pre-RFP conference: | October 29, 2024 |
| Deadline for Questions: | November 12, 2024 |
| Submission Due Date: | November 19, 2024 |
| Evaluation of Submissions: | Week of November 25th |
| Commissioners Court Permission to Negotiate: | December 17, 2024 |
| Negotiations: | Beginning December 18 2024 |
| Final Contract Approval Commissioners Court: | January 14, 2025 |

## 9.0 PRE-RFP CONFERENCE:

A pre-RFP conference will be conducted on **Tuesday, October 29, 2024, at 9:30AM** (CST). The pre-RFP conference will be held at The Purchasing department, at 301 Jackson, Suite 201, Richmond, TX 77469. It is necessary for all interested vendors to view the site. This is the only date and time vendors will be permitted to view the site and take measurements.

## 10.0 RETENTION OF RESPONDENT'S MATERIAL:

The County reserves the right to retain all proposals regardless of which response is selected. All proposals and accompanying documents become the property of the County.

## 11.0 CERTIFICATE OF INDEPENDENT PRICE DETERMINATION:

By submission of a proposal, each Respondent certifies, that in connection with this procurement:

11.1 The prices in this proposal have been arrived at independently, without consultation, communication, or agreement with any other Respondent; with any competitor; or with any County employee(s) or consultant(s) for the purpose of restricting competition on any matter relating to this Proposal.

11.2 Unless otherwise required by law, the prices which have been quoted in this proposal have not been knowingly disclosed by the Respondent and will not knowingly be disclosed by the Respondent prior to award directly or indirectly to no other Respondent or to any competitor; and;

11.3 No attempt has been made or will be made by the Respondent to induce any other person or firm to submit or not to submit a proposal for the purpose of restricting competition.

## 12.0 ASSIGNMENT:

The Respondent may not sell, assign, transfer or convey the contract resulting from this Proposal, in whole or in part, without the prior written approval from Fort Bend County Commissioners' Court.

## 13.0 CONFIDENTIAL MATTERS:

13.1 All data and information gathered by the Respondent and its agents, including this Proposal and all reports, recommendations, specifications, and data shall be treated by the Respondent and it's agents as confidential. The Respondent and it's agents shall not disclose or communicate the aforesaid matters to a third party or use them in advertising, publicity, propaganda, and/or in another job or jobs, unless written consent is obtained from the County.

13.2 Proposals will only be publicly received and acknowledged only so as to avoid disclosure of the contents to competing Respondents and kept secret during negotiation. However, all proposals shall be open for public inspection after the contract is awarded. Trade secrets and any material that is considered to be confidential information contained in the proposal and identified by Respondent as such will be treated as confidential to the extent allowable in the Open Records Act.

## 14.0 LIMITS OF SUBCONTRACTORS:

14.1 The County has approval rights over the use and/or removal of all subcontractors and/or vendor(s). Subcontractors shall conform to all County policies.

14.2 Any dispute between the Respondent and subcontractors, including any payment dispute, will be promptly remedied by the Respondent. Failure to promptly remedy or to make prompt payment to subcontractor may result in the

withholding of funds from the Respondent by the County for any payments owed to the subcontractor.

## 15.0 JURISDICTION, VENUE, CHOICE OF LAW:

This Proposal and any contract resulting there from shall be governed by and construed according to the laws of the State of Texas. Should any portion of any contract be in conflict with the laws of the State of Texas, the State laws shall invalidate only that portion. The remaining portion of the contract(s) shall remain in effect. Any lawsuit shall be governed by Texas law and Fort Bend County, Texas shall be the venue for any action or proceeding that may be brought or arise out of, in connection with or by reason of this Proposal process and resulting Agreements.

## 16.0 INDEPENDENT CONTRACTOR:

The Respondent is an independent contractor and no employee or agent of the Respondent shall be deemed for any reason to be an employee or agent of the County.

## 17.0 AMERICANS WITH DISABILITIES ACT (ADA)

Proposals shall comply with all federal, state, county, and local laws concerning this type of products/service/equipment/project and the fulfillment of all ADA requirements.

## 18.0 DRUG-FREE WORKPLACE:

All Respondents shall provide any and all notices as may be required under the Drug-Free Workplace Act of 1988, 28 CFR Part 67, Subpart F, to their employees and all sub-contractors to insure that the County maintains a drug-free workplace.

## 19.0 PERFORMANCE AND PAYMENT BOND:

In the event the total accepted bid price exceeds $25,000 the Contractor must provide a payment bond in the amount of 100% of the total contract sum, and in the event the total accepted bid price exceeds $100,000 the contractor must also provide a performance bond in the amount of 100% of the total contract sum. Bonds must be submitted to the Office of the County Purchasing Agent within ten (10) calendar days after receipt of notification of bid award. Such bonds shall be executed by a corporate surety duly authorized and admitted to do business in the State of Texas and licensed in the State of Texas to issue surety bonds with a Best Rating of "A" or better. Fort Bend County reserves the right to accept or reject any surety company proposed by the Contractor. In the event Fort Bend County rejects, the proposed surety company, the Contractor will be afforded five (5) additional days to submit the required bonds issued by a surety company acceptable to Fort Bend County.

## 20.0 POWER OF ATTORNEY:

An attorney-in-fact who signs a bid bond, performance bond or payment bond must file with each bond a certified and effectively dated copy of his or her power of attorney.

## 21.0 TEXAS ETHICS COMMISSION FORM 1295:

21.1 Effective January 1, 2016 all contracts executed by Commissioners Court, regardless of the dollar amount, will require completion of Form 1295 "Certificate of Interested Parties", per the new Government Code Statute §2252.908. All firms submitting a response to a formal Bid, RFP, SOQ or any contracts, contract amendments, renewals or change orders are required to complete the Form 1295 online through the State of Texas Ethics Commission website. Please visit: https://www.ethics.state.tx.us/whatsnew/elf_info_form1295.htm.

21.2 On-line instructions:

21.2.1 Name of governmental entity is to read: Fort Bend County

21.2.2 Identification number use: RFP 25-017

21.2.3 Description is: Construction of Justice Center Courtroom

21.3 Apparent low bidder(s) will be required to provide the Form 1295 within three (3) calendar days from notification; however, if your company is publicly traded you are not required to complete this form.

## 22.0 INSURANCE:

22.1 All respondents shall submit, with RFP, a current certificate of insurance indicating coverage in the amounts stated below. In lieu of submitting a certificate of insurance, respondents may submit, with RFP, a notarized statement from an Insurance company, authorized to conduct business in the State of Texas, and acceptable to Fort Bend County, guaranteeing the issuance of an insurance policy, with the coverage stated below, to the firm named therein, if successful, upon award of this Contract.

22.2 At contract execution, contractor shall furnish County with properly executed certificates of insurance, which shall evidence all insurance required and provide that such insurance shall not be canceled, except on 30 days prior written notice to County. Contractor shall provide certified copies of insurance endorsements and/or policies if requested by County. Contractor shall maintain such insurance coverage from the time Services commence until Services are completed and provide replacement certificates, policies and/or endorsements for any such insurance expiring prior to completion of Services. Contractor shall obtain such

insurance written on an Occurrence form (or a Claims Made form for Professional Liability insurance) from such companies having Best's rating of A/VII or better, licensed or approved to transact business in the State of Texas, and shall obtain such insurance of the following types and minimum limits:

22.2.1 Workers' Compensation insurance. Substitutes to genuine Workers' Compensation Insurance will not be allowed.

22.2.2 Employers' Liability insurance with limits of not less than $1,000,000 per injury by accident, $1,000,000 per injury by disease, and $1,000,000 per bodily injury by disease.

22.2.3 Commercial general liability insurance with a limit of not less than $1,000,000 each occurrence and $2,000,000 in the annual aggregate. Policy shall cover liability for bodily injury, personal injury, and property damage and products/completed operations arising out of the business operations of the policyholder.

22.2.4 Business Automobile Liability coverage with a combined Bodily Injury/Property Damage limit of not less than $1,000,000 each accident. The policy shall cover liability arising from the operation of licensed vehicles by policyholder.

22.3 County and the members of Commissioners Court shall be named as additional insured to all required coverage except for Workers' Compensation and Professional Liability (if required). All Liability policies including Workers' Compensation written on behalf of contractor, excluding Professional Liability, shall contain a waiver of subrogation in favor of County and members of Commissioners Court.

22.4 If required coverage is written on a claims-made basis, contractor warrants that any retroactive date applicable to coverage under the policy precedes the effective date of the contract; and that continuous coverage will be maintained or an extended discovery period will be exercised for a period of two (2) years beginning from the time that work under the agreement is completed.

22.5 Builder's Risk Insurance: Contractor is required to provide proof before a Purchase Order is issued for this project and keep in full force and effect until the Transfer Date, Builders Risk Insurance, subject to policy terms and conditions, of direct physical loss or damage to property, materials, equipment and supplies which are to become an integral part of the Project, whether owned by Contractor, or subcontractors of every tier, and in which one or more of same has an insurable interest, while in transit, while at the Construction Site awaiting construction, during construction, and until the Transfer Date. Such insurance shall be maintained to cover, as nearly as practicable, the insurable value of such property, materials, equipment and supplies at risk, and shall contain a waiver of

subrogation in favor of Contractor, Architect, subcontractors of any tier and Owner for loss or damage occurring during the Work and shall name Contractor as the named insured and Owner as additional insureds. All Builder's Risk Insurance proceeds shall be paid directly to the Contractor.

## 23.0 INDEMNIFICATION:

Respondent shall save harmless County from and against all claims, liability, and expenses, including reasonable attorney's fees, arising from activities of Respondent, its agents, servants or employees, performed under this agreement that result from the negligent act, error, or omission of Respondent or any of Respondent's agents, servants or employees.

23.1 Respondent shall timely report all such matters to Fort Bend County and shall, upon the receipt of any such claim, demand, suit, action, proceeding, lien or judgment, not later than the fifteenth day of each month; provide Fort Bend County with a written report on each such matter, setting forth the status of each matter, the schedule or planned proceedings with respect to each matter and the cooperation or assistance, if any, of Fort Bend County required by Respondent in the defense of each matter.

23.2 Respondent's duty to defend, indemnify and hold Fort Bend County harmless shall be absolute. It shall not abate or end by reason of the expiration or termination of any contract unless otherwise agreed by Fort Bend County in writing. The provisions of this section shall survive the termination of the contract and shall remain in full force and effect with respect to all such matters no matter when they arise.

23.3 In the event of any dispute between the parties as to whether a claim, demand, suit, action, proceeding, lien or judgment appears to have been caused by or appears to have arisen out of or in connection with acts or omissions of Respondent, Respondent shall never-the-less fully defend such claim, demand, suit, action, proceeding, lien or judgment until and unless there is a determination by a court of competent jurisdiction that the acts and omissions of Respondent are not at issue in the matter.

23.4 Respondent's indemnification shall cover, and Respondent agrees to indemnify Fort Bend County, in the event Fort Bend County is found to have been negligent for having selected Respondent to perform the work described in this request.

23.5 The provision by Respondent of insurance shall not limit the liability of Respondent under an agreement.

23.6 Respondent shall cause all trade contractors and any other contractor who may have a contract to perform construction or installation work in the area where work will be performed under this request, to agree to indemnify Fort Bend County and to hold it harmless from all claims for bodily injury and property damage that arise may from said Respondent's operations. Such provisions shall

be in form satisfactory to Fort Bend County.

23.7 Loss Deduction Clause - Fort Bend County shall be exempt from, and in no way liable for, any sums of money which may represent a deductible in any insurance policy. The payment of deductibles shall be the sole responsibility of Respondent and/or trade contractor providing such insurance.

## 24.0 PREVAILING WAGES:

This project is subject to the prevailing wage rate requirements of Chapter 2258 of the Government Code. All persons employed by Contractor shall be compensated at not less than the rates shown below. Contractor shall keep detailed records of each of its workers and said records shall be made available to County for inspection at all reasonable times. The Contractor shall pay Fort Bend County sixty dollars ($60.00) for each worker employed by the Contractor for the provision of services described herein for each calendar day or part of the day that the worker is paid less than the below stated rates. Contractors may also visit www.wdol.gov/dba.aspx.

General Decision Number: TX20240247 06/14/2024
Superseded General Decision Number: TX20230247

State: Texas
Construction Type: Building

County: Fort Bend County in Texas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022: Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least $17.20 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2024.

If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January|30, 2022: Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least $12.90 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2024.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a
conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at http://www.dol.gov/whd/govcontracts.

| Modification Number | Publication Date |
|---|---|
| 0 | 01/05/2024 |
| 1 | 06/14/2024 |

| | Rates | Fringes |
|---|---|---|
| ASBE0022-009 07/03/2023 | | |
| ASBESTOS WORKER/HEAT & FROST INSULATOR (Duct, Pipe and Mechanical System Insulation) | $ 28.35 | 16.02 |
| BOIL0074-003 07/01/2023 | | |
| BOILERMAKER | $ 37.00 | 24.64 |
| CARP0551-008 04/01/2021 | | |
| CARPENTER (Excludes Acoustical Ceiling Installation, Drywall Hanging, Form Work and Metal Stud Installation) | $ 25.86 | 9.08 |
| ELEC0716-005 08/29/2023 | | |
| ELECTRICIAN (Excludes Low Voltage Wiring and Installation of Alarms) | $ 34.50 | 10.41 |
| *ELEV0031-003 01/01/2024 | | |
| ELEVATOR MECHANIC | $ 51.32 | 37.885+a+b |

FOOTNOTES:

A. 6% under 5 years based on regular hourly rate for all hours worked. 8% over 5 years based on regular hourly rate for all hours worked.

B. Holidays: New Year's Day; Memorial Day; Independence Day; Labor Day; Thanksgiving Day; Friday after Thanksgiving Day; Christmas Day; and Veterans Day.

ENGI0450-002 04/01/2014

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|---|---|---|
| POWER EQUIPMENT OPERATOR | | |
| Cranes | $ 34.85 | 9.85 |
| IRON0084-002 06/01/2023 | | |
| IRONWORKER (ORNAMENTAL AND STRUCTURAL) | $ 27.51 | 8.13 |
| PLAS0783-001 04/01/2023 | | |
| PLASTERER | $ 31.34 | 10.30 |
| PLUM0068-002 10/01/2023 | | |
| PLUMBER | $ 34.86 | 11.68 |
| PLUM0211-010 10/01/2023 | | |
| PIPEFITTER (Including HVAC Pipe Installation) | $ 38.31 | 12.61 |
| SHEE0054-003 04/01/2020 | | |
| SHEET METAL WORKER (Excludes HVAC Duct and Unit Installation) | $ 29.70 | 13.85 |
| *SUTX2014-023 07/21/2014 | | |
| ACOUSTICAL CEILING MECHANIC | $ 16.41 ** | 3.98 |
| BRICKLAYER | $ 19.86 | 0.00 |
| CAULKER | $ 15.36 ** | 0.00 |
| CEMENT MASON/CONCRETE FINISHER | $ 13.82 ** | 0.00 |
| DRYWALL FINISHER/TAPER | $ 16.30 ** | 3.71 |
| DRYWALL HANGER AND METAL STUD INSTALLER | $ 17.45 | 3.96 |
| ELECTRICIAN (Alarm Installation Only) | $ 17.97 | 3.37 |

| | | |
|---|---|---|
| ELECTRICIAN (Low Voltage Wiring Only) | $ 18.00 | 1.68 |
| FLOOR LAYER: Carpet | $ 20.00 | 0.00 |
| FORM WORKER | $ 11.87 ** | 0.00 |
| GLAZIER | $ 19.12 | 4.41 |
| INSULATOR – BATT | $ 14.87 ** | 0.73 |
| IRONWORKER, REINFORCING | $ 12.10 ** | 0.00 |
| LABORER: Common or General | $ 10.79 ** | 0.00 |
| LABORER: Mason Tender – Brick | $ 13.37 ** | 0.00 |
| LABORER: Mason Tender - Cement/Concrete | $ 10.50 ** | 0.00 |
| LABORER: Pipelayer | $ 12.94 ** | 0.00 |
| LABORER: Roof Tearoff | $ 11.28 ** | 0.00 |
| LABORER: Landscape and Irrigation | $ 9.49 ** | 0.00 |
| LATHER | $ 19.73 | 0.00 |
| OPERATOR: Backhoe/Excavator/Trackhoe | $ 14.10 ** | 0.00 |
| OPERATOR: Bobcat/Skid Steer/Skid Loader | $ 13.93 ** | 0.00 |
| OPERATOR: Bulldozer | $ 20.77 | 0.00 |
| OPERATOR: Drill | $ 16.22 ** | 0.34 |
| OPERATOR: Forklift | $ 15.64 ** | 0.00 |
| OPERATOR: Grader/Blade | $ 13.37 ** | 0.00 |
| OPERATOR: Loader | $ 13.55 ** | 0.94 |
| OPERATOR: Mechanic | $ 17.52 | 3.33 |
| OPERATOR: Paver (Asphalt, Aggregate, and Concrete) | $ 16.03 ** | 0.00 |
| OPERATOR: Roller | $ 16.00 ** | 0.00 |

| | | |
|---|---|---|
| PAINTER (Brush, Roller and Spray), Excludes Drywall Finishing/Taping | $ 16.77 ** | 4.51 |
| ROOFER | $ 15.40 ** | 0.00 |
| SHEET METAL WORKER (HVAC Duct Installation Only) | $ 17.81 | 2.64 |
| SHEET METAL WORKER (HVAC Unit Installation Only) | $ 16.00 ** | 1.61 |
| SPRINKLER FITTER (Fire Sprinklers) | $ 22.17 | 9.70 |
| TILE FINISHER | $ 12.00 ** | 0.00 |
| TILE SETTER | $ 16.17 ** | 0.00 |
| TRUCK DRIVER: 1/Single Axle Truck | $ 14.95 ** | 5.23 |
| TRUCK DRIVER: Dump Truck | $ 12.39 ** | 1.18 |
| TRUCK DRIVER: Flatbed Truck | $ 19.65 | 8.57 |
| TRUCK DRIVER: Semi-Trailer Truck | $ 12.50 ** | 0.00 |
| TRUCK DRIVER: Water Truck | $ 12.00 ** | 4.11 |
| WATERPROOFER | $ 14.39 ** | 0.00 |

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($17.20) or 13658 ($12.90). Please see the Note at the top of the wage determination for more information. Please also note that the minimum wage requirements of Executive Order 14026 are not currently being enforced as to any contract or subcontract to which the states of Texas, Louisiana, or Mississippi, including their agencies, are a party.

Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker

protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.
Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal

number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

State Adopted Rate Identifiers

Classifications listed under the ""SA"" identifier indicate that the prevailing wage rate set by a state (or local) government was adopted under 29 C.F.R ⁄1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 01/03/2024 reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:
* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.

Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

**25.0 PERMITS:**

It shall be the sole responsibility of the successful Respondent to obtain any required permits in the name of Fort Bend County.

**26.0 TAX EXEMPT:**

Fort Bend County is exempt from state and local sales and use taxes under Section 151.309 of the Texas Tax Code. This project will be deemed a separate project for Texas tax purposes, and as such, Fort Bend County hereby issues its Texas Exemption for the purchase of any items qualifying for exemption under this project. Respondent is to issue its Texas Resale Certificate to vendors and subcontractors for such items qualifying for this exemption, and further, Respondent should state these items at cost.

**27.0 NAME BRANDS:**

Name Brands: Specifications may reference name brands and model numbers. It is not the intent of Fort Bend County to restrict these bids in such cases, but to establish a desired quality level of merchandise or to meet a pre-established standard due to like existing items. Bidders may offer items of equal stature and the burden of proof of such stature rests with them. Fort Bend County shall act as sole judge in determining equality and acceptability of products offered.

**28.0 EVALUATION CRITERIA:**

In order to facilitate the analysis of responses to this Proposal, Respondents are required to prepare their proposals in accordance with the instructions outlined in this part. Proposals should be prepared as simply as possible and provide a straightforward, concise description of the Respondent’s capabilities to satisfy the requirements of the Proposal. Emphasis should be

concentrated on accuracy, completeness, and clarity of content. All parts, pages, figures, and tables should be numbered and clearly labeled.

28.1 Respondents are required to follow the outline below when preparing their proposals:

| Tab | Title |
|---|---|
| | Title Page |
| | Letter of Transmittal |
| | Table of Contents |
| | Executive Summary |
| 1 | Cost |
| 2 | Understanding Scope of Work |
| 3 | Firm's Experience |
| 4 | Staff Experience |
| 5 | Proposed Schedule |
| 6 | Overall Completeness of Proposal |

28.2 Any exceptions to the Proposal requirements shall be identified in the applicable section.

28.3 Executive Summary - This part of the response to the Proposal should be limited to a brief narrative highlighting the Respondent's proposal. This section should not include cost quotations. Note that the executive summary should identify the primary contacts for the Respondent.

28.4 Respondents will be evaluated utilizing the factors, as weighted below:

Tab 1

Cost (weight factor = 45%)

- Complete Exhibit I.

Tab 2

Understanding Scope of Work (weight factor = 15%)

- Respondents must express, in detail, their understanding of this specific project. In addition, describe how the project requested will be provided and managed. Describe the approach your firm will take to the required collaboration, scheduling and coordination required for this project.

Tab 3

Firm's Experience (weight factor = 15%)

- Firm Experience with Projects of Similar Size and Complexity: Such experience must be in the form of providing general

contracting services for similar facilities. List a minimum of three (3) similar projects completed within the last ten (10) years; provide the name and location of each project, detailed description of project, completion date, final cost, the client, and a contact person and phone number.

Tab 4

Staff Experience (weight factor = 10%)

- Staff Experience with Projects of Similar Size and Complexity: Such experience must be in the form of providing project management and construction services for similar facilities. List a minimum of three (3) similar projects completed within the last ten (10) years; provide the name and location of each project, the client, and a contact person and phone number and completion date. In addition, provide resumes for project superintendent and project manager who will be assigned to this project.

Tab 5

Proposed Schedule (weight factor = 10%)

- Provide project schedule.

Tab 6

Overall Completeness of Proposal (weight factor = 5%)

- Required Proof of Insurance
- Completed Respondent forms
- Completed W9 form
- Completed debt form
- Completed Contractor Acknowledgement of Stormwater Management Program form

## 29.0 AWARD:

The County will select the respondent whose proposal is the highest evaluated and responsible for the County. Contractual commitments are contingent upon the availability of funds, as evidenced by the issuance of a purchase order. All contracts are subject to the approval of the County's legal counsel and Commissioners' Court, prior to execution. Once awarded, the contract will be the final expression of the agreement between the parties and may not be altered, changed, or amended except by mutual agreement, in writing.

## 30.0 RETAINAGE:

Within thirty (30) days after receipt of each uncontested Application for Payment together with the supporting materials required, County shall advance to Contractor the uncontested amount requested in such uncontested Application for Payment, except *five* percent (5%) of the amount requested (hereinafter "Retainage") in each Application for Payment by County. The Retainage withheld shall be released upon final completion of the entire Project and verification of satisfactory work performed, unless grounds exist for withholding payment on account of other defaults by Contractor, including services provided by its sub-contractors.

## 31.0 LIQUIDATED DAMAGES:

If the Services are not substantially completed within the time for performance or within such additional time as may be extended by County, County will deduct from the final payment as liquidated damages and not as a penalty the sum of two hundred and fifty ($250.00) per calendar day that the Services are not substantially complete. Such sum is agreed upon as a reasonable and proper measure of the damages County will sustain.

## 32.0 STATE LAW REQUIREMENTS FOR CONTRACTS:

The contents of this section are required by Texas Law and are included by County regardless of content.

32.1 Agreement to Not Boycott Israel Chapter 2271 Texas Government Code: Contractor verifies that if Contractor employs ten (10) or more full-time employees and this Agreement has a value of $100,000 or more, Contractor does not boycott Israel and will not boycott Israel during the term of this Agreement.

32.2 Texas Government Code Section 2251.152 Acknowledgment: By signature on vendor form, Contractor represents pursuant to Section 2252.152 of the Texas Government Code, that Contractor is not listed on the website of the Comptroller of the State of Texas concerning the listing of companies that are identified under Section 806.051, Section 807.051 or Section 2253.153.

## 33.0 VENDOR STATUS:

The awarded vendor is required to hold an **active** status on the SAM.gov website https://sam.gov/content/home, if applicable, along with the Texas Comptroller Taxable Entity website https://mycpa.cpa.state.tx.us/coa/ .

## 34.0 HUMAN TRAFFICKING:

By acceptance of this contract, Contractor acknowledges that Fort Bend County is opposed to human trafficking and that no County funds will be used in support of services or activities that violate human trafficking laws.

## 35.0 REQUIRED FORMS:

All respondents submitting are required to complete the attached and return with submission:

35.1 Vendor Form

35.2 W9 Form

35.3 Tax Form/Debt/Residence Certification

35.4 Contractor Acknowledgement of Stormwater Management Program

## 36.0 EXHIBIT:

Exhibit I: Pricing

Exhibit II: Project Manual

Exhibit III: Plans

Form **W-9**
(Rev. December 2014)
Department of the Treasury
Internal Revenue Service

# Request for Taxpayer Identification Number and Certification

**Give Form to the requester. Do not send to the IRS.**

Print or type
See **Specific Instructions** on page 2.

**1** Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

**2** Business name/disregarded entity name, if different from above

**3** Check appropriate box for federal tax classification; check only **one** of the following seven boxes:

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=partnership) ▶ _____

**Note.** For a single-member LLC that is disregarded, do not check LLC; check the appropriate box in the line above for the tax classification of the single-member owner.

☐ Other (see instructions) ▶

**4** Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

*(Applies to accounts maintained outside the U.S.)*

**5** Address (number, street, and apt. or suite no.)

Requester's name and address (optional)

**6** City, state, and ZIP code

**7** List account number(s) here (optional)

## Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

**Note.** If the account is in more than one name, see the instructions for line 1 and the chart on page 4 for guidelines on whose number to enter.

**Social security number**

| | | | – | | – | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

**or**

**Employer identification number**

| | | – | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |

## Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

**Certification instructions.** You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 3.

| **Sign Here** | **Signature of U.S. person ▶** | **Date ▶** |
|---|---|---|

# General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

**Future developments**. Information about developments affecting Form W-9 (such as legislation enacted after we release it) is at *www.irs.gov/fw9*.

## Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

*If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding.* See *What is backup withholding?* on page 2.

By signing the filled-out form, you:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income, and
4. Certify that FATCA code(s) entered on this form (if any) indicating that you are exempt from the FATCA reporting, is correct. See *What is FATCA reporting?* on page 2 for further information.

**Note.** If you are a U.S. person and a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

**Definition of a U.S. person.** For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien;
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States;
- An estate (other than a foreign estate); or
- A domestic trust (as defined in Regulations section 301.7701-7).

**Special rules for partnerships.** Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax under section 1446 on any foreign partners' share of effectively connected taxable income from such business. Further, in certain cases where a Form W-9 has not been received, the rules under section 1446 require a partnership to presume that a partner is a foreign person, and pay the section 1446 withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid section 1446 withholding on your share of partnership income.

In the cases below, the following person must give Form W-9 to the partnership for purposes of establishing its U.S. status and avoiding withholding on its allocable share of net income from the partnership conducting a trade or business in the United States:

- In the case of a disregarded entity with a U.S. owner, the U.S. owner of the disregarded entity and not the entity;
- In the case of a grantor trust with a U.S. grantor or other U.S. owner, generally, the U.S. grantor or other U.S. owner of the grantor trust and not the trust; and
- In the case of a U.S. trust (other than a grantor trust), the U.S. trust (other than a grantor trust) and not the beneficiaries of the trust.

**Foreign person.** If you are a foreign person or the U.S. branch of a foreign bank that has elected to be treated as a U.S. person, do not use Form W-9. Instead, use the appropriate Form W-8 or Form 8233 (see Publication 515, Withholding of Tax on Nonresident Aliens and Foreign Entities).

**Nonresident alien who becomes a resident alien.** Generally, only a nonresident alien individual may use the terms of a tax treaty to reduce or eliminate U.S. tax on certain types of income. However, most tax treaties contain a provision known as a "saving clause." Exceptions specified in the saving clause may permit an exemption from tax to continue for certain types of income even after the payee has otherwise become a U.S. resident alien for tax purposes.

If you are a U.S. resident alien who is relying on an exception contained in the saving clause of a tax treaty to claim an exemption from U.S. tax on certain types of income, you must attach a statement to Form W-9 that specifies the following five items:

1. The treaty country. Generally, this must be the same treaty under which you claimed exemption from tax as a nonresident alien.

2. The treaty article addressing the income.

3. The article number (or location) in the tax treaty that contains the saving clause and its exceptions.

4. The type and amount of income that qualifies for the exemption from tax.

5. Sufficient facts to justify the exemption from tax under the terms of the treaty article.

***Example.*** Article 20 of the U.S.-China income tax treaty allows an exemption from tax for scholarship income received by a Chinese student temporarily present in the United States. Under U.S. law, this student will become a resident alien for tax purposes if his or her stay in the United States exceeds 5 calendar years. However, paragraph 2 of the first Protocol to the U.S.-China treaty (dated April 30, 1984) allows the provisions of Article 20 to continue to apply even after the Chinese student becomes a resident alien of the United States. A Chinese student who qualifies for this exception (under paragraph 2 of the first protocol) and is relying on this exception to claim an exemption from tax on his or her scholarship or fellowship income would attach to Form W-9 a statement that includes the information described above to support that exemption.

If you are a nonresident alien or a foreign entity, give the requester the appropriate completed Form W-8 or Form 8233.

## Backup Withholding

**What is backup withholding?** Persons making certain payments to you must under certain conditions withhold and pay to the IRS 28% of such payments. This is called "backup withholding." Payments that may be subject to backup withholding include interest, tax-exempt interest, dividends, broker and barter exchange transactions, rents, royalties, nonemployee pay, payments made in settlement of payment card and third party network transactions, and certain payments from fishing boat operators. Real estate transactions are not subject to backup withholding.

You will not be subject to backup withholding on payments you receive if you give the requester your correct TIN, make the proper certifications, and report all your taxable interest and dividends on your tax return.

**Payments you receive will be subject to backup withholding if:**

1. You do not furnish your TIN to the requester,

2. You do not certify your TIN when required (see the Part II instructions on page 3 for details),

3. The IRS tells the requester that you furnished an incorrect TIN,

4. The IRS tells you that you are subject to backup withholding because you did not report all your interest and dividends on your tax return (for reportable interest and dividends only), or

5. You do not certify to the requester that you are not subject to backup withholding under 4 above (for reportable interest and dividend accounts opened after 1983 only).

Certain payees and payments are exempt from backup withholding. See *Exempt payee code* on page 3 and the separate Instructions for the Requester of Form W-9 for more information.

Also see *Special rules for partnerships* above.

## What is FATCA reporting?

The Foreign Account Tax Compliance Act (FATCA) requires a participating foreign financial institution to report all United States account holders that are specified United States persons. Certain payees are exempt from FATCA reporting. See *Exemption from FATCA reporting code* on page 3 and the Instructions for the Requester of Form W-9 for more information.

## Updating Your Information

You must provide updated information to any person to whom you claimed to be an exempt payee if you are no longer an exempt payee and anticipate receiving reportable payments in the future from this person. For example, you may need to provide updated information if you are a C corporation that elects to be an S corporation, or if you no longer are tax exempt. In addition, you must furnish a new Form W-9 if the name or TIN changes for the account; for example, if the grantor of a grantor trust dies.

## Penalties

**Failure to furnish TIN.** If you fail to furnish your correct TIN to a requester, you are subject to a penalty of $50 for each such failure unless your failure is due to reasonable cause and not to willful neglect.

**Civil penalty for false information with respect to withholding.** If you make a false statement with no reasonable basis that results in no backup withholding, you are subject to a $500 penalty.

**Criminal penalty for falsifying information.** Willfully falsifying certifications or affirmations may subject you to criminal penalties including fines and/or imprisonment.

**Misuse of TINs.** If the requester discloses or uses TINs in violation of federal law, the requester may be subject to civil and criminal penalties.

# Specific Instructions

## Line 1

You must enter one of the following on this line; **do not** leave this line blank. The name should match the name on your tax return.

If this Form W-9 is for a joint account, list first, and then circle, the name of the person or entity whose number you entered in Part I of Form W-9.

a. **Individual.** Generally, enter the name shown on your tax return. If you have changed your last name without informing the Social Security Administration (SSA) of the name change, enter your first name, the last name as shown on your social security card, and your new last name.

**Note. ITIN applicant:** Enter your individual name as it was entered on your Form W-7 application, line 1a. This should also be the same as the name you entered on the Form 1040/1040A/1040EZ you filed with your application.

b. **Sole proprietor or single-member LLC.** Enter your individual name as shown on your 1040/1040A/1040EZ on line 1. You may enter your business, trade, or "doing business as" (DBA) name on line 2.

c. **Partnership, LLC that is not a single-member LLC, C Corporation, or S Corporation.** Enter the entity's name as shown on the entity's tax return on line 1 and any business, trade, or DBA name on line 2.

d. **Other entities.** Enter your name as shown on required U.S. federal tax documents on line 1. This name should match the name shown on the charter or other legal document creating the entity. You may enter any business, trade, or DBA name on line 2.

e. **Disregarded entity.** For U.S. federal tax purposes, an entity that is disregarded as an entity separate from its owner is treated as a "disregarded entity." See Regulations section 301.7701-2(c)(2)(iii). Enter the owner's name on line 1. The name of the entity entered on line 1 should never be a disregarded entity. The name on line 1 should be the name shown on the income tax return on which the income should be reported. For example, if a foreign LLC that is treated as a disregarded entity for U.S. federal tax purposes has a single owner that is a U.S. person, the U.S. owner's name is required to be provided on line 1. If the direct owner of the entity is also a disregarded entity, enter the first owner that is not disregarded for federal tax purposes. Enter the disregarded entity's name on line 2, "Business name/disregarded entity name." If the owner of the disregarded entity is a foreign person, the owner must complete an appropriate Form W-8 instead of a Form W-9. This is the case even if the foreign person has a U.S. TIN.

## Line 2

If you have a business name, trade name, DBA name, or disregarded entity name, you may enter it on line 2.

## Line 3

Check the appropriate box in line 3 for the U.S. federal tax classification of the person whose name is entered on line 1. Check only one box in line 3.

**Limited Liability Company (LLC).** If the name on line 1 is an LLC treated as a partnership for U.S. federal tax purposes, check the "Limited Liability Company" box and enter "P" in the space provided. If the LLC has filed Form 8832 or 2553 to be taxed as a corporation, check the "Limited Liability Company" box and in the space provided enter "C" for C corporation or "S" for S corporation. If it is a single-member LLC that is a disregarded entity, do not check the "Limited Liability Company" box; instead check the first box in line 3 "Individual/sole proprietor or single-member LLC."

## Line 4, Exemptions

If you are exempt from backup withholding and/or FATCA reporting, enter in the appropriate space in line 4 any code(s) that may apply to you.

**Exempt payee code.**

- Generally, individuals (including sole proprietors) are not exempt from backup withholding.
- Except as provided below, corporations are exempt from backup withholding for certain payments, including interest and dividends.
- Corporations are not exempt from backup withholding for payments made in settlement of payment card or third party network transactions.
- Corporations are not exempt from backup withholding with respect to attorneys' fees or gross proceeds paid to attorneys, and corporations that provide medical or health care services are not exempt with respect to payments reportable on Form 1099-MISC.

The following codes identify payees that are exempt from backup withholding. Enter the appropriate code in the space in line 4.

1—An organization exempt from tax under section 501(a), any IRA, or a custodial account under section 403(b)(7) if the account satisfies the requirements of section 401(f)(2)

2—The United States or any of its agencies or instrumentalities

3—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

4—A foreign government or any of its political subdivisions, agencies, or instrumentalities

5—A corporation

6—A dealer in securities or commodities required to register in the United States, the District of Columbia, or a U.S. commonwealth or possession

7—A futures commission merchant registered with the Commodity Futures Trading Commission

8—A real estate investment trust

9—An entity registered at all times during the tax year under the Investment Company Act of 1940

10—A common trust fund operated by a bank under section 584(a)

11—A financial institution

12—A middleman known in the investment community as a nominee or custodian

13—A trust exempt from tax under section 664 or described in section 4947

The following chart shows types of payments that may be exempt from backup withholding. The chart applies to the exempt payees listed above, 1 through 13.

| IF the payment is for . . . | THEN the payment is exempt for . . . |
|---|---|
| Interest and dividend payments | All exempt payees except for 7 |
| Broker transactions | Exempt payees 1 through 4 and 6 through 11 and all C corporations. S corporations must not enter an exempt payee code because they are exempt only for sales of noncovered securities acquired prior to 2012. |
| Barter exchange transactions and patronage dividends | Exempt payees 1 through 4 |
| Payments over $600 required to be reported and direct sales over $5,000[1] | Generally, exempt payees 1 through 5[2] |
| Payments made in settlement of payment card or third party network transactions | Exempt payees 1 through 4 |

[1] See Form 1099-MISC, Miscellaneous Income, and its instructions.

[2] However, the following payments made to a corporation and reportable on Form 1099-MISC are not exempt from backup withholding: medical and health care payments, attorneys' fees, gross proceeds paid to an attorney reportable under section 6045(f), and payments for services paid by a federal executive agency.

**Exemption from FATCA reporting code.** The following codes identify payees that are exempt from reporting under FATCA. These codes apply to persons submitting this form for accounts maintained outside of the United States by certain foreign financial institutions. Therefore, if you are only submitting this form for an account you hold in the United States, you may leave this field blank. Consult with the person requesting this form if you are uncertain if the financial institution is subject to these requirements. A requester may indicate that a code is not required by providing you with a Form W-9 with "Not Applicable" (or any similar indication) written or printed on the line for a FATCA exemption code.

A—An organization exempt from tax under section 501(a) or any individual retirement plan as defined in section 7701(a)(37)

B—The United States or any of its agencies or instrumentalities

C—A state, the District of Columbia, a U.S. commonwealth or possession, or any of their political subdivisions or instrumentalities

D—A corporation the stock of which is regularly traded on one or more established securities markets, as described in Regulations section 1.1472-1(c)(1)(i)

E—A corporation that is a member of the same expanded affiliated group as a corporation described in Regulations section 1.1472-1(c)(1)(i)

F—A dealer in securities, commodities, or derivative financial instruments (including notional principal contracts, futures, forwards, and options) that is registered as such under the laws of the United States or any state

G—A real estate investment trust

H—A regulated investment company as defined in section 851 or an entity registered at all times during the tax year under the Investment Company Act of 1940

I—A common trust fund as defined in section 584(a)

J—A bank as defined in section 581

K—A broker

L—A trust exempt from tax under section 664 or described in section 4947(a)(1)

M—A tax exempt trust under a section 403(b) plan or section 457(g) plan

**Note.** You may wish to consult with the financial institution requesting this form to determine whether the FATCA code and/or exempt payee code should be completed.

## Line 5

Enter your address (number, street, and apartment or suite number). This is where the requester of this Form W-9 will mail your information returns.

## Line 6

Enter your city, state, and ZIP code.

# Part I. Taxpayer Identification Number (TIN)

**Enter your TIN in the appropriate box.** If you are a resident alien and you do not have and are not eligible to get an SSN, your TIN is your IRS individual taxpayer identification number (ITIN). Enter it in the social security number box. If you do not have an ITIN, see *How to get a TIN* below.

If you are a sole proprietor and you have an EIN, you may enter either your SSN or EIN. However, the IRS prefers that you use your SSN.

If you are a single-member LLC that is disregarded as an entity separate from its owner (see *Limited Liability Company (LLC)* on this page), enter the owner's SSN (or EIN, if the owner has one). Do not enter the disregarded entity's EIN. If the LLC is classified as a corporation or partnership, enter the entity's EIN.

**Note.** See the chart on page 4 for further clarification of name and TIN combinations.

**How to get a TIN.** If you do not have a TIN, apply for one immediately. To apply for an SSN, get Form SS-5, Application for a Social Security Card, from your local SSA office or get this form online at *www.ssa.gov*. You may also get this form by calling 1-800-772-1213. Use Form W-7, Application for IRS Individual Taxpayer Identification Number, to apply for an ITIN, or Form SS-4, Application for Employer Identification Number, to apply for an EIN. You can apply for an EIN online by accessing the IRS website at *www.irs.gov/businesses* and clicking on Employer Identification Number (EIN) under Starting a Business. You can get Forms W-7 and SS-4 from the IRS by visiting IRS.gov or by calling 1-800-TAX-FORM (1-800-829-3676).

If you are asked to complete Form W-9 but do not have a TIN, apply for a TIN and write "Applied For" in the space for the TIN, sign and date the form, and give it to the requester. For interest and dividend payments, and certain payments made with respect to readily tradable instruments, generally you will have 60 days to get a TIN and give it to the requester before you are subject to backup withholding on payments. The 60-day rule does not apply to other types of payments. You will be subject to backup withholding on all such payments until you provide your TIN to the requester.

**Note.** Entering "Applied For" means that you have already applied for a TIN or that you intend to apply for one soon.

**Caution:** *A disregarded U.S. entity that has a foreign owner must use the appropriate Form W-8.*

## Part II. Certification

To establish to the withholding agent that you are a U.S. person, or resident alien, sign Form W-9. You may be requested to sign by the withholding agent even if items 1, 4, or 5 below indicate otherwise.

For a joint account, only the person whose TIN is shown in Part I should sign (when required). In the case of a disregarded entity, the person identified on line 1 must sign. Exempt payees, see *Exempt payee code* earlier.

**Signature requirements.** Complete the certification as indicated in items 1 through 5 below.

**1. Interest, dividend, and barter exchange accounts opened before 1984 and broker accounts considered active during 1983.** You must give your correct TIN, but you do not have to sign the certification.

**2. Interest, dividend, broker, and barter exchange accounts opened after 1983 and broker accounts considered inactive during 1983.** You must sign the certification or backup withholding will apply. If you are subject to backup withholding and you are merely providing your correct TIN to the requester, you must cross out item 2 in the certification before signing the form.

**3. Real estate transactions.** You must sign the certification. You may cross out item 2 of the certification.

**4. Other payments.** You must give your correct TIN, but you do not have to sign the certification unless you have been notified that you have previously given an incorrect TIN. "Other payments" include payments made in the course of the requester's trade or business for rents, royalties, goods (other than bills for merchandise), medical and health care services (including payments to corporations), payments to a nonemployee for services, payments made in settlement of payment card and third party network transactions, payments to certain fishing boat crew members and fishermen, and gross proceeds paid to attorneys (including payments to corporations).

**5. Mortgage interest paid by you, acquisition or abandonment of secured property, cancellation of debt, qualified tuition program payments (under section 529), IRA, Coverdell ESA, Archer MSA or HSA contributions or distributions, and pension distributions.** You must give your correct TIN, but you do not have to sign the certification.

## What Name and Number To Give the Requester

| For this type of account: | Give name and SSN of: |
|---|---|
| 1. Individual | The individual |
| 2. Two or more individuals (joint account) | The actual owner of the account or, if combined funds, the first individual on the account[1] |
| 3. Custodian account of a minor (Uniform Gift to Minors Act) | The minor[2] |
| 4. a. The usual revocable savings trust (grantor is also trustee)<br>b. So-called trust account that is not a legal or valid trust under state law | The grantor-trustee[1]<br>The actual owner[1] |
| 5. Sole proprietorship or disregarded entity owned by an individual | The owner[3] |
| 6. Grantor trust filing under Optional Form 1099 Filing Method 1 (see Regulations section 1.671-4(b)(2)(i)(A)) | The grantor* |
| **For this type of account:** | **Give name and EIN of:** |
| 7. Disregarded entity not owned by an individual | The owner |
| 8. A valid trust, estate, or pension trust | Legal entity[4] |
| 9. Corporation or LLC electing corporate status on Form 8832 or Form 2553 | The corporation |
| 10. Association, club, religious, charitable, educational, or other tax-exempt organization | The organization |
| 11. Partnership or multi-member LLC | The partnership |
| 12. A broker or registered nominee | The broker or nominee |
| 13. Account with the Department of Agriculture in the name of a public entity (such as a state or local government, school district, or prison) that receives agricultural program payments | The public entity |
| 14. Grantor trust filing under the Form 1041 Filing Method or the Optional Form 1099 Filing Method 2 (see Regulations section 1.671-4(b)(2)(i)(B)) | The trust |

[1] List first and circle the name of the person whose number you furnish. If only one person on a joint account has an SSN, that person's number must be furnished.

[2] Circle the minor's name and furnish the minor's SSN.

[3] You must show your individual name and you may also enter your business or DBA name on the "Business name/disregarded entity" name line. You may use either your SSN or EIN (if you have one), but the IRS encourages you to use your SSN.

[4] List first and circle the name of the trust, estate, or pension trust. (Do not furnish the TIN of the personal representative or trustee unless the legal entity itself is not designated in the account title.) Also see *Special rules for partnerships* on page 2.

***Note.** Grantor also must provide a Form W-9 to trustee of trust.

**Note.** If no name is circled when more than one name is listed, the number will be considered to be that of the first name listed.

## Secure Your Tax Records from Identity Theft

Identity theft occurs when someone uses your personal information such as your name, SSN, or other identifying information, without your permission, to commit fraud or other crimes. An identity thief may use your SSN to get a job or may file a tax return using your SSN to receive a refund.

To reduce your risk:

- Protect your SSN,
- Ensure your employer is protecting your SSN, and
- Be careful when choosing a tax preparer.

If your tax records are affected by identity theft and you receive a notice from the IRS, respond right away to the name and phone number printed on the IRS notice or letter.

If your tax records are not currently affected by identity theft but you think you are at risk due to a lost or stolen purse or wallet, questionable credit card activity or credit report, contact the IRS Identity Theft Hotline at 1-800-908-4490 or submit Form 14039.

For more information, see Publication 4535, Identity Theft Prevention and Victim Assistance.

Victims of identity theft who are experiencing economic harm or a system problem, or are seeking help in resolving tax problems that have not been resolved through normal channels, may be eligible for Taxpayer Advocate Service (TAS) assistance. You can reach TAS by calling the TAS toll-free case intake line at 1-877-777-4778 or TTY/TDD 1-800-829-4059.

**Protect yourself from suspicious emails or phishing schemes.** Phishing is the creation and use of email and websites designed to mimic legitimate business emails and websites. The most common act is sending an email to a user falsely claiming to be an established legitimate enterprise in an attempt to scam the user into surrendering private information that will be used for identity theft.

The IRS does not initiate contacts with taxpayers via emails. Also, the IRS does not request personal detailed information through email or ask taxpayers for the PIN numbers, passwords, or similar secret access information for their credit card, bank, or other financial accounts.

If you receive an unsolicited email claiming to be from the IRS, forward this message to *phishing@irs.gov.* You may also report misuse of the IRS name, logo, or other IRS property to the Treasury Inspector General for Tax Administration (TIGTA) at 1-800-366-4484. You can forward suspicious emails to the Federal Trade Commission at: *spam@uce.gov* or contact them at *www.ftc.gov/idtheft* or 1-877-IDTHEFT (1-877-438-4338).

Visit IRS.gov to learn more about identity theft and how to reduce your risk.

## Privacy Act Notice

Section 6109 of the Internal Revenue Code requires you to provide your correct TIN to persons (including federal agencies) who are required to file information returns with the IRS to report interest, dividends, or certain other income paid to you; mortgage interest you paid; the acquisition or abandonment of secured property; the cancellation of debt; or contributions you made to an IRA, Archer MSA, or HSA. The person collecting this form uses the information on the form to file information returns with the IRS, reporting the above information. Routine uses of this information include giving it to the Department of Justice for civil and criminal litigation and to cities, states, the District of Columbia, and U.S. commonwealths and possessions for use in administering their laws. The information also may be disclosed to other countries under a treaty, to federal and state agencies to enforce civil and criminal laws, or to federal law enforcement and intelligence agencies to combat terrorism. You must provide your TIN whether or not you are required to file a tax return. Under section 3406, payers must generally withhold a percentage of taxable interest, dividend, and certain other payments to a payee who does not give a TIN to the payer. Certain penalties may also apply for providing false or fraudulent information.

Job No.: _____

**TAX FORM/DEBT/ RESIDENCE CERTIFICATION**
**(for Advertised Projects)**

Taxpayer Identification Number (T.I.N.): _____

Company Name submitting Bid/Proposal: _____

Mailing Address: _____

Are you registered to do business in the State of Texas? Yes No

If you are an individual, list the names and addresses of any partnership of which you are a general partner or any assumed name(s) under which you operate your business

_____

_____

I. **Property:** List all taxable property in Fort Bend County owned by you or above partnerships as well as any d/b/a names. Include real and personal property as well as mineral interest accounts. (Use a second sheet of paper if necessary.)

| Fort Bend County Tax Acct. No.* | Property address or location** |
|---|---|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

** This is the property account identification number assigned by the Fort Bend County Appraisal District.*

*** For real property, specify the property address or legal description. For business personal property, specify the address where the property is located. For example, office equipment will normally be at your office, but inventory may be stored at a warehouse or other location.*

**II.** **Fort Bend County Debt** - Do you owe any debts to Fort Bend County (taxes on properties listed in I above, tickets, fines, tolls, court judgments, etc.)?

Yes No If yes, attach a separate page explaining the debt.

**III.** **Residence Certification** - Pursuant to Texas Government Code §2252.001 *et seq.*, as amended, Fort Bend County requests Residence Certification. §2252.001 *et seq.* of the Government Code provides some restrictions on the awarding of governmental contracts; pertinent provisions of §2252.001 are stated below:

(3) "Nonresident bidder" refers to a person who is not a resident.

(4) "Resident bidder" refers to a person whose principal place of business is in this state, including a contractor whose ultimate parent company or majority owner has its principal place of business in this state.

I certify that _____ is a Resident Bidder of Texas as defined in Government Code
[Company Name]
§2252.001.

I certify that _____ is a Nonresident Bidder as defined in Government Code
[Company Name]
§2252.001 and our principal place of business is _____.
[City and State]

**Mandatory Form**

## Contractor Acknowledgement of Storm Water Management Program

I hereby acknowledge that I am aware of the stormwater management program and standard operating procedures developed by Fort Bend County in compliance with the TPDES General Permit No. TXR040000. I agree to comply with all applicable best management practices and standard operating procedures while conducting my services for Fort Bend County. I agree to conduct all services in a manner that does not introduce illicit discharges of pollutants to streets, stormwater inlets, drainage ditches or any portion of the drainage system. The following materials and/or pollutant sources must not be discharged to the drainage system as a result of any services provided:

1. Grass clippings, leaves, mulch, rocks, sand, dirt or other waste materials resulting from landscaping activities, (except those materials resulting from ditch mowing or maintenance activities)
2. Herbicides, pesticides and/or fertilizers, (except those intended for aquatic use)
3. Detergents, fuels, solvents, oils and/or lubricants, other equipment and/or vehicle fluids,
4. Other hazardous materials including paints, thinners, chemicals or related waste materials,
5. Uncontrolled dewatering discharges, equipment and/or vehicle wash waters,
6. Sanitary waste, trash, debris, or other waste products
7. Wastewater from wet saw machinery,
8. Other pollutants that degrade water quality or pose a threat to human health or the environment.

Furthermore, I agree to notify Fort Bend County immediately of any issue caused by or identified by:

_____

(Company/Contractor)

that is believed to be an immediate threat to human health or the environment.

_____ _____

Contractor Signature Date

_____

Printed Name

_____

Title

**RFP 25-017**
**Construction of Justice Center Courtrooms**

**Exhibit I: Pricing**

Total Bid

$_____

Calendar days for completion _____

Acknowledgement of Receipt of Addendum(s), if issued by Purchasing, to the Request for Proposal Document.

Addendum No 1 dated _____ Received _____

Addendum No 2 dated _____ Received _____

Addendum No 3 dated _____ Received _____

Addendum No 4 dated _____ Received _____

_____
Name of Respondent

_____
Signature of Authorized Representative

_____
Printed Name of Representative

# Fort Bend County
# First Floor Courtroom Buildout
# 1422 Eugene Heimann Circle
# Richmond, Texas 77469

## Technical Documents and Specifications

October 17, 2024
ISSUE FOR PERMIT & BID

Prepared for: Southwest Airlines
PGAL Project No. 1007828.00

Prepared by: PGAL
3131 Briarpark Drive, Suite 200
Houston, Texas 77042

T 713 622 1444
F 713 968 9333

PGAL

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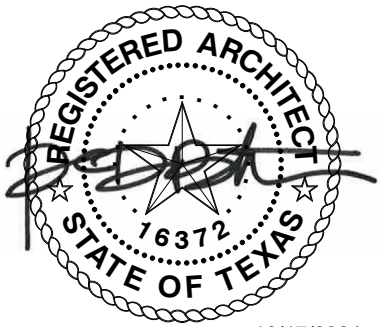
DOCUMENT 00 00 07 – PROFESSIONAL SEALS PAGE

1.1 DESIGN PROFESSIONALS OF RECORD

A.

| | |
|---|---|
| **ARCHITECT**<br><br>**PGAL**<br>3131 Briarpark, Suite 200<br>Houston, Texas 77042<br>Phone: (713) 622-1444 |  |

B.

| | |
|---|---|
| **MEP/TECHNOLOGY**<br><br>**DBR**<br>9990 Richmond Avenue<br>South Building, Suite 300<br>Houston, Texas 77042<br>Phone: (713) 914-0888 | **MECHANICAL, PLUMBING & TECHNOLOGY**<br> |
| | **ELECTRICAL**<br> |

END OF DOCUMENT 000107

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SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Work by Owner.
4. Access to site.
5. Survey of existing work.
6. Coordination with occupants.
7. Work restrictions.
8. Specification and drawing conventions.
9. Miscellaneous provisions.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

1.3 PROJECT INFORMATION

A. Project Identification: Fort Bend County First Floor Courtroom Buildout

1. Project Location: 1422 Eugene Heimann Circle, Richmond, Texas 77469

B. Owner: Fort Bend County, 301 Jackson Street, Richmond, Texas 77469; phone: (281) 342-3411, or their authorized representative.

C. Architect: PGAL, Inc., 3131 Briarpark, Suite 200, Houston, Texas 77042; phone: (713) 622-1444, or their authorized representative Paul D. Bonnette, Project Manager; email: pbonnette@pgal.com

D. Consultants: The following design professionals for designated portions of the Contract Documents:

1. MEP, Telecom, Audio Visual, Security: CNG Engineering, DBR Engineering Consultants, Inc., 9990 Richmond Avenue, South Building, Suite 300, Houston, Texas 77042; phone: (713) 914-0888, or their authorized representative.

E. Type of Contract:

1. Project will be constructed under a single prime contract.
2. The Owner is a sales tax exempt entity.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of the Project is defined by the Contract Documents and consists of the following:

1. Provide all material, labor, tools, plant, supplies, equipment, transportation, superintendence, temporary construction of every nature, insurance, contributions, and all services and facilities required for the construction for the Fort Bend County First Floor Courtroom Buildout, 1422 Eugene Heimann Circle, Richmond, Texas 77469

B. Unless noted otherwise, all construction will be performed in conformance with the building and design codes referenced within the Construction Documents, and the following:

1. 2015 International Building Code (IBC)
2. 2015 International Fire Code (IFC)
3. 2015 International Fuel Gas Code (IFGC)
4. 2017 National Electric Code (NEC) (NFPA 70)
5. 2015 International Mechanical Code (IMC)
6. 2015 International Energy Conservation Code (IECC)
7. 2015 International Plumbing Code (IPC)
8. 2012 Texas Accessibility Standards (TAS)

1.5 WORK BY OWNER

A. Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract, work by Owner, or ongoing existing operations.

1.6 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Use of Site: Limit use of Project site to areas within the Contract limits indicated, and according to the project phasing plans. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1.7 SURVEY OF EXISTING CONDITIONS

A. Contractor acknowledges by submitting a Proposal, that the Contractor has visited and inspected the Project Site on which the Work is to be performed, that the Contractor is satisfied as to the nature and location of the Work, including any obstructions, amount of

work, actual levels, the equipment, and facilities needed preliminary to and during the prosecution of the Work, and all other matters which can in any way affect the Work or the cost thereof under this Contract.

B. Failure by Contractor to be acquainted with available information concerning existing conditions, including factors affecting costs and liabilities, shall not relieve Contractor of responsibility for performance of Work in accordance with requirements.

1.8 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy existing site and buildings during the entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
2. Notify the Owner not less than 48 hours in advance of activities that will affect Owner's operations.

B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.

1. The Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.9 WORK RESTRICTIONS

A. Work Restrictions:

1. On-Site Work Hours: Limit work in the existing building to normal business working hours, Monday through Friday, except otherwise approved by the Owner.

a. Weekend Hours: Saturday, 7 am to 6 pm.
b. Hours for Utility Shutdowns: Coordinate with Owner.

2. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
3. Do not unreasonably encumber the site with materials or equipment.
4. Assume full responsibility for protection and safekeeping of products stored on premises.
5. Contractor shall establish secured staging area for work and coordinate and provide for safe passage and exit from building areas during construction, as determined by local building authorities having jurisdiction.
6. Coordinate use of site and premises with the Owner. Refer to Division 01 Section "Temporary Facilities and Controls" for additional requirements.

    a. Employee parking: In designated areas. The Owner is not responsible for damage to, theft of or from vehicles, or for towing or storage charges of illegally parked vehicles.
    b. Access to site and premises: In designated areas.
    c. Material storage and staging areas: In designated areas.
    d. Transport materials and equipment to and from construction area along routes approved by Owner.
    e. Do not use project existing restrooms without Owner’s permission. If use is approved, keep the premises clean daily.

7. The Owner reserves the right to perform construction operations with its own forces or to employ separate contractors on portions of the Project. General Contractor shall coordinate with this work in terms of providing site access, work space, and storage space, cooperation of work forces, scheduling, and technical requirements.
8. If access to adjacent common or occupied spaces is required:

    a. Schedule operations with Owner in advance.
    b. Perform work before or after normal business hours or weekends when directed by the Owner.

9. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

    a. Notify Owner not less than two days in the proposed utility interruptions.
    b. Obtain Owner’s written permission before proceeding with utility interruptions.

10. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise, vibration, odors, or other disruption to Owner occupancy with Owner.

    a. Notify Owner not less than two days in advance of the proposed disruptive operations.
    b. Obtain Owner’s written permission before proceeding with disruptive operations.

11. Smoking and Vaping:

    a. Smoking and vaping is not permitted except in designated areas. Ensure that smoking or vaping does not affect any interior spaces and are not within 25 feet of any entrances, operable windows, or outdoor air intakes.
    b. Smokeless tobacco product use is discouraged.

12. Alcohol and Controlled Substances: Use of alcohol and controlled substances on the Project site is prohibited.

13. Firearms: Except for law enforcement, firearms are prohibited on the Project site.

## 1.10 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

## 1.11 MISCELLANEOUS PROVISIONS

A. Permits, Fees, Fines and Notices

1. The Contractor shall be directly responsible for all fines or penalties levied by the City or County as a result of any breach of security or safety caused by the Contractor or the Contractor’s employees, subcontractors, suppliers or representatives.
2. The Contractor shall apply for, obtain and pay for all required permits and fees for this project.

PART 2 - PRODUCTS

Not Used

EXECUTION

Not Used

END OF SECTION

# SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section specifies administrative and procedural requirements for handling and processing Contract modifications.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, “Architect's Supplemental Instructions”.

### 1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: The Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by the Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
5. Comply with requirements in Division 01 Section “Product Requirements” if the proposed change requires substitution of one product or system for product or system specified.

C. Proposal Request Form: Use AIA Document G709 for Proposal Requests.

1.5 ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, base each Change Order proposal on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include the installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare an explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the Purchase Order amount or Contractor's handling, labor, installation, overhead, and profit. Submit claims within 21 days of receipt of the Change Order or Construction Change Directive authorizing work to proceed. The Owner will reject claims submitted later than 21 days after such authorization.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

1.6 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.7 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

# SECTION 01 29 00 - PAYMENT PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section specifies the administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by the Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

### 1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:

    a. Application for Payment forms with Continuation Sheets.
    b. Submittals Schedule.

2. Submit a Schedule of Values break down for general requirements, including, but not limited to supervision, mobilization, bonds and insurance, permits, contractor’s fee, close-out documents, and other items related to general conditions on the Project with Contractor’s proposal and submit the Schedule of Values to Architect at earliest possible date, but no later than seven (7) days before the date scheduled for submittal of initial Applications for Payment.
3. Subschedules: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values.

1. Identification: Include the following Project identification on the Schedule of Values:

    a. Project name and location.

b. Name of Architect.
c. Architect's project number.
d. Contractor's name and address.
e. Date of submittal.

2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

   a. Related Specification Section or Division.
   b. Description of the Work.
   c. Name of subcontractor.
   d. Name of manufacturer or fabricator.
   e. Name of supplier.
   f. Change Orders (numbers) that affect value.
   g. Dollar value. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
      (1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

3. Breakdown of the Contract Sum: Provide enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.

   a. Provide at least one line item for each Specification Section or major subcontract.

4. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

   a. Differentiate between items stored on-site and items stored off-site. If specified, include evidence of insurance or bonded warehousing, if required. Indicated location of items stored off-site.

5. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

6. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.

7. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

   a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

8. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by and paid for by Owner. The Architect will not review the Application for Payment.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Owner will return incomplete applications without action.

1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Owner by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application

1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
2. When an application shows completion of an item, submit final or full waivers.
3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
4. Waiver Delays: Submit each Application for Payment with Contractor's waiver of mechanic's lien for construction period covered by the application.

a. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Products list.
5. Schedule of unit prices.
6. Submittals Schedule (preliminary if not final).
7. List of Contractor's staff assignments.
8. List of Contractor's principal consultants.
9. Copies of building permits.
10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
11. Initial progress report.
12. Report of preconstruction conference.
13. Certificates of insurance and insurance policies.
14. Performance and payment bonds.
15. Data needed to acquire Owner's insurance.
16. Initial settlement survey and damage report if required.

H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims".
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens".
6. AIA Document G707, "Consent of Surety to Final Payment".
7. Close-out items, including, but not limited to all warranties, maintenance and operation manuals, demonstration videos, and keys.
8. Evidence that claims have been settled.
9. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
10. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

# SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General project coordination procedures.
2. Conservation.
3. Coordination Drawings.
4. Administrative and supervisory personnel.
5. Project meetings.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 COORDINATION

A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. If necessary, prepare a memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.

3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.

D. Conservation:

1. Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
2. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work.

## 1.4 SUBMITTALS

A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

1. Indicate relationship of components shown on separate Shop Drawings.
2. Indicate required installation sequences.
3. Refer to Divisions 15 through 16 for specific Coordination Drawing requirements for mechanical and electrical installations.

## 1.5 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Architect will record significant discussions and agreements achieved. Architect will distribute the meeting minutes to everyone concerned, including Owner and Contractor, within 5 days of the meeting.

B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments. Architect will record and distribute meeting minutes to all participants.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other parties concerned shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Tentative construction schedule.
    b. Phasing.
    c. Critical work sequencing.
    d. Designation of responsible personnel.
    e. Procedures for processing field decisions and Change Orders.
    f. Procedures for processing Applications for Payment.
    g. Distribution of the Contract Documents.
    h. Submittal procedures.
    i. Preparation of Record Documents.
    j. Use of the premises.
    k. Responsibility for temporary facilities and controls.
    l. Parking availability.
    m. Office, work, and storage areas.
    n. Equipment deliveries and priorities.
    o. First aid.
    p. Security.
    q. Progress cleaning.
    r. Working hours.
    s. Rain gauge, photos, and excused delays.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

    a. Contract Documents.
    b. Options.
    c. Related Change Orders.
    d. Purchases.
    e. Deliveries.
    f. Submittals.
    g. Review of mockups.
    h. Possible conflicts.
    i. Compatibility problems.
    j. Time schedules.
    k. Weather limitations.
    l. Manufacturer's written recommendations.
    m. Warranty requirements.
    n. Compatibility of materials.
    o. Acceptability of substrates.
    p. Temporary facilities and controls.
    q. Space and access limitations.

r. Regulations of authorities having jurisdiction.
s. Testing and inspecting requirements.
t. Required performance results.
u. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements.
4. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at regular intervals. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
b. Review present and future needs of each entity present, including the following:
1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Work hours.
10) Hazards and risks.
11) Progress cleaning.
12) Quality and work standards.
13) Change Orders.
14) Documentation of information for payment requests.
15) Requested excused delays.

3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

# SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes the administrative and procedural requirements for documenting the progress of construction during performance of the Work, including:

1. Preliminary Construction Schedule.
2. Contractor's Construction Schedule.
3. Submittals Schedule.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical activities are activities on the critical path. They must start and finish on the planned early start and finish times.
2. Predecessor activity is an activity that must be completed before a given activity can be started.

B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

C. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Event: The starting or ending point of an activity.

E. Float: The measure of leeway in starting and completing an activity.

1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

F. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

G. Major Area: A story of construction, a separate building, or a similar significant construction element.

H. Milestone: A key or critical point in time for reference or measurement.

1.4 SUBMITTALS

A. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other specified information.

B. Submittals Schedule: Submit one (1) electronic file in PDF format of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for final release or approval.

C. Preliminary Construction Schedule: Submit one (1) electronic file in PDF format.

D. Contractor's Construction Schedule: Submit one (1) one (1) electronic file in PDF format of initial schedule.

1.5 QUALITY ASSURANCE

A. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination". Review methods and procedures related to the Preliminary Construction Schedule and Contractor's Construction Schedule, including, but not limited to, the following:

1. Review software limitations and content and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including phasing, work stages, area separations, interim milestones, and partial Owner occupancy.
4. Review delivery dates for Owner-furnished products.
5. Review schedule for work of Owner's separate contracts.
6. Review time required for review of submittals and resubmittals.
7. Review requirements for tests and inspections by independent testing and inspecting agencies.
8. Review time required for completion and startup procedures.
9. Review and finalize list of construction activities to be included in schedule.
10. Review submittal requirements and procedures.
11. Review procedures for updating schedule.

B. Construction Photographs: Contractor shall maintain a digital camera on-site and upon request of Owner provide construction photographs at any time during course of construction. Submit photographs to the Owner in electronic format.

1.7 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit an electronic file in PDF format of schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Initial Submittal: Submit concurrently with preliminary bar-chart schedule. Include submittals required during the first 60 days of construction. List those required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

    a. At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.

3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 PRELIMINARY CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit an electronic file in PDF format to Architect and one hard copy to Owner of preliminary horizontal bar-chart-type construction schedule within seven (7) days of date established for commencement of the work.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 60 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Procedures: Comply with procedures contained in AGC's “Construction Planning & Scheduling”.

B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion and Final Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Owner.
2. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Division 01 Section “Submittal Procedures” in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
4. Startup and Testing Time: Include not less than 5 days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for administrative procedures necessary for certification of Substantial Completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Division 01 Section “Summary of Work.” Delivery dates indicated stipulate the earliest possible delivery date.
2. Work Restrictions: Show the effect of the following items on the schedule:

a. Coordination with existing construction.
b. Limitations of continued occupancies.
c. Uninterruptible services.
d. Partial occupancy before Substantial Completion.
e. Use of premises restrictions.
f. Provisions for future construction.
g. Seasonal variations.
h. Environmental control.

3. Area Separations: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

a. Structural completion.
b. Permanent space enclosure.
c. Completion of mechanical installation.
d. Completion of electrical installation.
e. Substantial Completion.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, interim milestones, Substantial Completion, and Final Completion.

F. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.

G. Computer Software:

1. Prepare schedules using a program that has been developed specifically to manage construction schedules.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

A. Gantt-Chart Schedule: Submit an electronic file in PDF format to Architect and one hard copy to Owner of a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 20 days of date established for the Notice to Proceed. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project.

B. Preparation:

1. Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
2. For construction activities that require three (3) months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Contractor's Construction Schedule Updating: At bi-weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Submit an electronic file in PDF format to Architect and one hard copy to Owner of approved schedule to Owner, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

# SECTION 01 33 00 - SUBMITTAL PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes the administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 DEFINITIONS

A. Action Submittals: Written and graphic information that requires Architect’s action.

B. Informational Submittals: Written information that does not require Architect's approval. Submittals may be rejected for not complying with requirements.

### 1.4 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. Submittals Schedule: Comply with requirements in Division 01 Section “Construction Progress Documentation” for list of submittals and time requirements for scheduled performance of related construction activities.

C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal.

1. Initial Review: Allow 10 days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with

subsequent submittals. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

2. Concurrent Review: Where concurrent review of submittals by Architect's consultants, Owner, or other parties is required, allow 15 days for initial review of each submittal.

D. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 4 by 5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information on label for processing and recording action taken:

a. Project name.
b. Date.
c. Name and address of Architect.
d. Name and address of Contractor.
e. Name and address of subcontractor.
f. Name and address of supplier.
g. Name of manufacturer.
h. Unique identifier, including revision number.
i. Number and title of appropriate Specification Section.
j. Drawing number and detail references, as appropriate.
k. Other necessary identification.

E. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals.

F. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.

G. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will return submittals, without review received from sources other than Contractor.

1. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements of the Contract Documents, including minor variations and limitations. Include the same label information as the related submittal.
2. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
3. Transmittal Form: Provide locations on form for the following information:

a. Project name.
b. Date.
c. Destination (To:).
d. Source (From:).

e. Names of subcontractor, manufacturer, and supplier.
f. Category and type of submittal.
g. Submittal purpose and description.
h. Submittal and transmittal distribution record.
i. Remarks.
j. Signature of transmitter.

H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

I. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.

1.5 CONTRACTOR'S USE OF ELECTRONIC DRAWING FILES

A. Electronic copies of the construction drawings produced by the Architect may be furnished for Contractor's use in preparing submittals upon request by the Contractor. Requests from subcontractors will not be accepted.

1. The Contractor must submit a single written request for all files to be used; multiple requests by the Contractor may be rejected by the Architect. Request for electronic Drawing files must be accompanied by:

a. Signed copy of the Architect's CADD File Indemnification Agreement". This form is available upon request from the Architect.
b. A list of the name and number of the Drawing sheet as listed on the "Index of Drawings".
c. Contractor's preference for form and format of electronic Drawing files.

2. Requested electronic Drawing files will be furnished to the Contractor by the Architect on a CD/DVD or posted to an FTP site at the discretion of the Contractor.

a. Electronic Drawing files will have necessary x-ref files and layers bound to the electronic Drawing file. A list of layers will not be provided.
b. Electronic Drawing files will not contain professional seals or company logos.
c. Electronic Drawing files will be produced using the Architect's current version of AutoCad. The Contractor may specify that the files be produced in a format useable by an earlier version.

3. By requesting electronic drawing files produced by the Architect, the Contractor acknowledges that:

a. Contractor is responsible for the accuracy and completeness of the Shop Drawings prepared from these files and submitted in compliance with requirements.
b. Files are being transmitted as a convenience to the Contractor at the request of the Contractor.
c. Files were not prepared by the Architect for use as Shop Drawings.

d. Files may not reflect most current revisions.
e. Architect is under no obligation to inform the Contractor of subsequent revisions to the files.

B. The Contractor should direct written requests to each design consultant (structural, MEP, etc.) for copies of electronic drawing files produced by their offices.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit Action Submittals required by individual Specification Sections.

1. Number of Written Copies: Submit one copy of each submittal. Architect will return one original and one electronic copy. Mark up and retain one returned copy as a Project Record Document.
2. Number of Drawing Copies: Submit one original copy of each drawing submittal. Architect will return one original and one electronic copy. The contractor shall be responsible for any additional copies required for distribution. Retain one returned copy as a Project Record Document.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's written recommendations.
b. Manufacturer's product specifications.
c. Manufacturer's installation instructions.
d. Standard color charts.
e. Manufacturer's catalog cuts.
f. Wiring diagrams showing factory-installed wiring.
g. Printed performance curves.
h. Operational range diagrams.
i. Mill reports.
j. Standard product operating and maintenance manuals.
k. Compliance with recognized trade association standards.
l. Compliance with recognized testing agency standards.
m. Application of testing agency labels and seals.
n. Notation of coordination requirements.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Include the following information, as applicable:

a. Dimensions.
b. Identification of products.
c. Fabrication and installation drawings.
d. Roughing-in and setting diagrams.
e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
f. Shopwork manufacturing instructions.
g. Templates and patterns.
h. Schedules.
i. Design calculations.
j. Compliance with specified standards.
k. Notation of coordination requirements.
l. Notation of dimensions established by field measurement.

2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches.

D. Coordination Drawings: Comply with requirements in Division 01 Section “Project Management and Coordination”.

E. Samples: Prepare physical units of materials or products, including the following:

1. Comply with requirements in Division 01 Section “Quality Requirements” for mockups.
2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
3. Samples for Verification: Submit one full-size unit or Sample of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Architect's sample where so indicated. Attach label on unexposed side that includes the following:

a. Generic description of Sample.
b. Product name or name of manufacturer.
c. Sample source.

5. Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, provide the following:

a. Size limitations.

b. Compliance with recognized standards.
c. Availability.
d. Delivery time.

6. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.

   a. If variation in color, pattern, texture, or other characteristic is inherent in the product represented by a Sample, submit at least three sets of paired units that show approximate limits of the variations.
   b. Refer to individual Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

7. Number of Samples for Initial Selection: Submit one full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
8. Number of Samples for Verification: Submit one set of Samples. Architect will return Sample set. Mark up and retain returned Sample set as a Project Record Sample.

   a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

9. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

F. Product Schedule or List: Prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product.
2. Number and name of room or space.
3. Location within room or space.

G. Delegated-Design Submittal: Comply with requirements in Division 01 Section “Quality Requirements”

H. Submittals Schedule: Comply with requirements in Division 01 Section "Construction Progress Documentation".

I. Application for Payment: Comply with requirements in Division 01 Section "Payment Procedures".

J. Schedule of Values: Comply with requirements in Division 01 Section "Payment Procedures".

K. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit one electronic copy of each submittal required. Architect will not return copy.
2. Certificates and Certifications: Provide a notarized statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
3. Test and Inspection Reports: Comply with requirements in Division 01 Section "Quality Requirements."

B. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

C. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements.

D. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

E. Installer Certificates: Prepare written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.

F. Manufacturer Certificates: Prepare written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

G. Material Certificates: Prepare written statements on manufacturer's letterhead certifying that material complies with requirements.

H. Material Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

I. Preconstruction Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements.

J. Compatibility Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

K. Field Test Reports: Prepare reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.

L. Product Test Reports: Prepare written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

M. Research/Evaluation Reports: Prepare written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with 2003 International Building Code with City of Houston Amendments in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

N. Maintenance Data: Prepare written and graphic instructions and procedures for operation and normal maintenance of products and equipment. Comply with requirements in Division 01 Section “Closeout Procedures, Operation, and Maintenance Data”.

O. Design Data: Prepare written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

P. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a

product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

Q. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

R. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

S. Construction Photographs: Comply with requirements in Division 01 Section “Construction Progress Documentation”.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents. Submittal number shall correspond with specification section number. NO EXCEPTIONS.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, mark to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp, and mark the stamp appropriately to indicate the action taken, as follows:

1. Final Unrestricted Release: Where the submittal is marked “No Exceptions Taken”, the Work covered by the submittal may proceed provided it complies with the Contract Documents. Final acceptance will depend on that compliance.
2. Final-but-Restricted Release: Where the submittal is marked “Note Markings”, the Work covered by the submittal may proceed provided it complies with both Architect’s notations and corrections on the submittal and the Contract Documents. Final acceptance will depend on that compliance.
3. Returned for Resubmittal: Where the submittal is marked Rejected or Resubmit”, do not proceed with the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity for the product submitted. Revise or prepare a new submittal according to Architect’s notations and corrections.
4. Incomplete: Where the submittal is marked “Confirm”, do not proceed with the Work covered by the submittal. Prepare additional information requested, or required by the Contract Documents, that indicates compliance with requirements. Architect will indicate a number of days within which Contractor is required to submit additional information. When the additional information is not submitted during that period, the submittal may be returned for resubmittal.
5. Other Action: If the submittal is primarily for information purposes, record purposes, special processing, or other contractor activity, the submittal will be returned marked “ACTION NOT REQUIRED”.
6. Informational Submittals: Architect will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

C. Do not permit submittals to be used at the Project Site, or elsewhere where Work is in progress that are marked with any one of the following actions:

1. “REJECTED OR RESUBMIT”
2. “CONFIRM”

D. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

E. Informational Submittals: Architect will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

END OF SECTION

AN AGREEMENT BETWEEN ARCHITECT OF RECORD AND
CONTRACTOR FOR TRANSFER OF COMPUTER AIDED DRAFTING (CAD) AND/OR REVIT FORMAT FILES ON
ELECTRONIC MEDIA

Architect of Record (AOR)
PGAL

Contractor

A/E's Project No: **1007828.00**
Project Name: **Fort Bend County First Floor Courtroom Buildout**
Location: **Eugene Heimann Circle, Richmond, Texas 77469**

The **AOR** will provide the following Revit BIM model for this project
____Architecture_____
_____
_____

Drawings were prepared on the following:
Computer Hardware: **IBM Compatible Operating System: Windows 10 Professional**
Software: **Revit Format 2020**

Contractor shall pay AOR a service fee of **0** for Architectural Files only.

TERMS AND CONDITIONS:

AOR makes no representation as to the compatibility of the CAD and/or REVIT format files with any hardware orsoftware.

Since the information the AOR set forth on the CAD and/or REVIT format files can be modified or amended, unintentionally or otherwise, the AOR reserves the right to remove all indicia of its ownership and/or involvementfrom each electronic display.

All information on the CAD and REVIT format is considered instruments of service of the AOR and shall not be used for other projects, for additions to this project, or completion of the project by others. CAD and/or REVIT format shall remain the property of the AOR and in no case shall the transfer of these files be considered a forfeit of ownership.

AOR makes no representation regarding the accuracy, completeness, or permanence of CAD and/or REVIT format files, nor for their merchantability or fitness for a particular purpose or an intended use. Addenda information or revisions made after the date indicated on the CAD and/or REVIT format files may not have been incorporated. In the event of a conflict between the sealed contract drawings and CAD and/or REVIT format files,the sealed contract drawings shall govern. It is the Contractor's responsibility to determine if any conflicts exist. The CAD and/or REVIT format files shall not be considered to be Contract Documents.

The use of CAD and/or REVIT format files shall not in any way obviate the Contractor's responsibility for the proper checking and coordination of dimensions, details, member sizes and gage, and quantities of materials as required to facilitate complete and accurate fabrication, erection and sequencing of construction. The CAD and/or REVIT format files is not intended to provide the level of detail needed in order to extract precise material or

object quantities.

The Contractor, including its clients, sub consultants and subcontractors, shall indemnify and hold harmless the AOR, its officers, directors, shareholders, employees, affiliates and its sub-consultants from any and all claims, damages, losses, expenses, penalties, causes of action and liabilities of any kind, including attorney's fees, and other defense costs, arising out of or resulting from the use of the CAD and/or REVIT format files by the Contractor, or by any third party recipient or user of the CAD and/or REVIT format files from the Contractor. Each party agreesto waive claims against the other parties for consequential damages arising out of or relating to their use of, or access to, the CAD and/or REVIT format files. Consequential damages include, but are not limited to, loss of use and loss of profit, loss of business, loss of income, loss of reputation or any other consequential damages that either party may have incurred from any cause of action.

The AOR believes that no licensing or copyright fees are due to others on account of the transfer of the CAD and/or REVIT format files, but to the extent any are, the Contractor will be responsible for and pay the appropriate fees. Contractor agrees to defend, indemnify and hold the AOR harmless from and against any and all loss, damage, liability or expense (including without limitation, attorneys' fees and other defense costs) of any kind by reason of any actual or alleged infringement of any patent, copyright, trademark, trade secret or other proprietaryright of a third party arising out of or resulting from the use of CAD and/or REVIT format files on any work done by Contractor or any of its subcontractors.

Any purchase order number provided by the Contractor is for Contractor's accounting purposes only. Purchase order terms and conditions are void and are not a part of this agreement.

Payment of the aforementioned service fee is due prior to the release of the CAD/Revit files.

This agreement shall be governed by the laws of the State of Texas.

If a dispute arises out of or relates to this Agreement, or the breach thereof, and if the dispute cannot be settled through negotiations, the parties agree first to try in good faith to settle the dispute by mediation administered by a mutually acceptable mediator before resorting to arbitration, litigation or some other dispute resolution procedure. The fees for the mediator will be shared equally by the parties.

IN WITNESS WHEREOF, the parties hereto have each caused this Agreement to be executed by its duly authorized representatives to be effective as of the _____day of_____, 2024.

AUTHORIZED ACCEPTANCE:

PGAL, INC.

(Contractor's Name)

_____

_____
by Project Manager Paul D Bonnette

_____
Print Name and Title

END OF SECTION

# SECTION 01 40 00 - QUALITY REQUIREMENTS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes the administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve the Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples.

D. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.4 DELEGATED DESIGN

A. Performance and Design Criteria:

1. Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
2. If the criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

1.5 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Description of test and inspection.
3. Identification of applicable standards.
4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality control service.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

C. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

D. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or products that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy the qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.

G. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.

H. Preconstruction Testing: Testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.

1. Contractor responsibilities include the following:

a. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of product to comply with performance requirements.
b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
c. Fabricate and install test assemblies using installers who will perform the same tasks for Project.
d. When testing is complete, remove assemblies; do not reuse materials on Project.

2. Testing Agency Responsibilities: Promptly issue a certified written report of each test, inspection, and similar quality-assurance service to Architect, Owner, Structural Engineer and Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

I. Mockups: Before installing portions of the Work requiring mockups, build mockups required to comply with the following requirements, using materials indicated for the completed Work:

1. Construct an integrated mockup composed of exterior finishes and materials and constructed to conform to indicated details.

2. Mockup Size: Not more than 10 feet by 10 feet.
3. Conform to the details on the Drawings for construction. Demonstrate the proposed range of aesthetic effects and workmanship.
4. Notify Architect seven days in advance of dates and times when mockups will be constructed.
5. Demonstrate the proposed range of aesthetic effects and workmanship.
6. Obtain Architect's approval of mockups before starting work, fabrication, or construction. Architect’s approval will be for quality of workmanship, material finish, and detailed integration of materials.
7. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
8. Demolish and remove mockups when directed, unless otherwise indicated.

1.7 QUALITY CONTROL

A. Owner Responsibilities: Owner will engage a qualified testing agency to perform these services.

1. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they direct.
6. The absence of Owner Provided Testing Services during construction shall not relieve the Contractor from constructing the project in accordance with the Construction Documents. The Contractor shall be responsible for proving and payment of testing services necessary to assure this conformance.

B. Special Tests and Inspections: Owner will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.

1. The testing agency will notify Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
2. The testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
3. The testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. The testing agency will retest and reinspect corrected work.

C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
5. Do not perform any duties of Contractor.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify the agency sufficiently in advance of operations to permit the assignment of personnel. Provide the following:

1. Access to Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assisting agency in obtaining samples.
4. Facilities for storage and field-curing test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 14 days of date established for commencement of the Work.

1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 ACCEPTABLE TESTING AGENCIES

A. To be provided by Owner.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

1.2 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. Unless otherwise indicated, the following definitions apply to this project:

1. "Approved": The term "approved," when used to convey Architect's action on Contractor's submittals, applications, and requests, is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
2. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by Architect, requested by Architect, and similar phrases.
3. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on Drawings or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.
4. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
5. "Furnish": The term "furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
6. "Install": The term "install" describes operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
7. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.
8. "Installer": An installer is the Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
9. The term "experienced," when used with an entity, means having successfully completed a minimum of 3 previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

    a. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply

that specified requirements apply exclusively to tradespeople of the corresponding generic name.

1.3 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.

C. Conflicting Requirements:

1. If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
2. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

D. Copies of Standards:

1. Each entity engaged in construction on Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
2. Where copies of standards are needed to perform the required construction activity, obtain copies directly from publication source and make them available on request.

E. Abbreviations and Acronyms: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the name of entities generally recognized in the construction industry. The Architect will make a complete list available by the to the Contractor upon written request. Types of entities include:

1. Industry Organizations.
2. Code Agencies.
3. Federal Government Agencies.
4. State Government Agencies.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

# SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes the requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

### 1.4 QUALITY ASSURANCE

A. Standards: Comply with ANSI A10.6, NECA's “Temporary Electrical Facilities”, and NFPA 241.

1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

### 1.5 TEMPORARY FACILITIES

A. Temporary Utilities, Services, and Facilities:

1. Utilities:
   a. Water, sewer, electrical for lighting, power, heat and air conditioning, and permanent fire protection that exist within the area of the Project, as indicated on the Drawings, will be made available to the Contractor and paid for by the Owner. By accepting use of these services and facilities the Contractor agrees to keep them clean and in good working condition at all times and upon completion of the Project, turn over all services and facilities, indicated to remain, in as good or better condition than existed at start of the Project. All additional temporary services and facilities

necessary to complete the Project shall be included at no additional expense to the Owner.

1) Contractor shall provide temporary wiring, lamps, distribution of power, and equipment required for construction, inspection and testing of Work.
2) Contractor shall provide temporary water hoses and equipment required during construction, inspection and testing of Work.
3) Contractor shall provide temporary climate control (heating, cooling and humidity control) required for construction of Work.
   a) Provide heat to prevent freezing and to avoid damage to materials in storage, during and after installation, and during curing and drying of materials and finishes. Contractor shall provide and maintain such dependable source of supply of heat, cooling, and humidity control as necessary until the Work is accepted. No open fire heaters will be permitted. No mold, mildew, rust, or sagging materials resulting from humidity will be allowed.

2. Temporary Toilets and Sanitation: Contractor will be required to provide and maintain portable sanitary facilities in sanitary condition in accordance with authorities having jurisdiction.
3. Drinking Water, Paper Cups, and Waste Facilities: Contractor shall provide drinking water, paper cups, and adequate waste facilities for paper cup disposal. Empty and maintain waste disposal in accordance with authorities having jurisdiction.
4. Temporary Communications Service:
   a. Contractor shall furnish and maintain the following for Contractor's superintendent's use for the duration of the Project.
      1) Mobile telephone. All costs in connection with this mobile telephone shall be paid by the Contractor. At Contractor's option, two-way radios (walkie-talkies) may be used in lieu of a mobile telephone.

B. Temporary Protection:

1. Contractor shall at all times provide temporary protection against weather, so as to maintain all work, materials, apparatus, and fixtures free from injury and damages.
2. At the end of the day's work, all new work likely to be damaged shall be covered or otherwise protected.
3. Contractor shall protect all walls and floors, including existing elevators and stairs used in the route for moving materials to the Work area.

C. Temporary Office and Storage Sheds: Contractor shall provide its own office and storage sheds on the premises, maintain them during construction, and remove them upon completion of the Work.

1. When any area in the building is used for a staging area, storage area, shop area, etc., the Contractor shall be responsible for repairs, patching, and cleaning required as a result of such use. All repair and replacement costs and expenses shall be at no additional expense to the Owner.

2. Building materials, Contractor's equipment, etc., may be stored on the premises, with Owner’s permission, but the placing and handling of such materials and equipment shall not encumber the site or interfere with Owner’s operations. They shall be able to be inspected at all times and shall be the Contractor’s responsibility to protect.

D. Temporary First Aid Facilities:

1. Contractor shall provide first aid equipment and supplies, with qualified personnel continuously available to render first aid at the site.
2. Contractor shall provide a "911" sign, posted at the field office telephone for emergency medical services.

E. Temporary Barricades and Enclosures:

1. Contractor shall provide barricades and enclosures required by Owner or local building authority. The Contractor shall also maintain area free of unauthorized personnel which shall include Project working area and storage locations allocated by the Owner to the Contractor. The Contractor shall also protect adjacent property free from disturbance, dust, and from noise as much as feasible. Paint barricades and enclosures with two coats of latex enamel in up to three colors as selected by the Architect.
2. Provide temporary enclosures to separate work areas from the areas of existing building occupied by Owner; to prevent penetration of dust or moisture into occupied areas, to prevent damage to existing equipment, and to protect Owner's employees and operations from construction work.
   a. Temporary Partition and Ceiling Enclosures: Use framing and sheet materials which comply with structural and fire rating requirements of applicable codes and standards. Close joints between sheet materials, and seal edges and intersections with existing surfaces, to prevent penetration of dust or moisture. In locations where fire protection is required, paint both sides of partitions and ceilings with fire-retardant paint to provide maximum flame spread of 25 when tested under ASTM E84, or as required by local fire regulations.

3. Contractor shall be held responsible for all injury to the work and persons due to failure of barricades, signs, lights, and watchmen to protect it; and wherever evidence is found of such injury, the Owner may order the work so injured to be immediately removed and replaced by the Contractor. All costs and expenses for such occurrences shall be borne by the Contractor at no additional expense to the Owner. Contractor's responsibility for maintenance of barricades, signs, and lights, and for providing watchmen, shall not cease until the Project has been completed and is accepted by the Owner.

F. Temporary Parking:

1. Contractor shall be responsible to arrange for parking at the site with the Owner.

   1. Owner will not be responsible for contractor, subcontractor, vendor, or their employees parking charges.

2. Owner will not be responsible for any damages, towing, or storage lot charges of any vehicle illegally parked.
3. Owner will not be responsible for any loss, damage, or theft from or of any vehicles of any contractor, subcontractor, vendor, or their employees.

G. Temporary Signs:

1. Provide a project sign as designated by the Architect. All lettering shall be performed by a professional sign painter. The sign will include the name of the Project, Owner, Contractor, Architect, and each of the project consultants. The Architect will provide a project sign layout after the award of the Contract.
2. Other signs permitted at the site: Locate where required by authorities having jurisdiction.
   a. Warning signs.
   b. Directional signs.
   c. Identification signs at field offices.
   d. Emergency medical services sign at field offices.
   e. Other signs required by authorities having jurisdiction.

3. Contractor shall allow no other signs to be displayed at the project site, unless authorized in writing by the Owner.

H. Temporary Construction Operations:

1. Temporary Ladders, Scaffolds, Chutes, Hoists, Runways, and Similar Facilities:
   a. Provide and maintain all temporary equipment and construction such as temporary stairs, ladders, ramps, scaffolds, hoists, runways, derricks, chutes, and similar facilities necessary for the proper execution of the Work. Include temporary shoring and bracing to protect against heavy loading of equipment or materials.
   b. All such apparatus, equipment, and construction shall comply with all applicable laws, rules, regulations, codes, ordinances, and orders of all Federal, State, and Local authorities having jurisdiction.
   c. Scaffolding shall be furnished, installed, maintained, and removed as necessary for proper execution of the Work and shall be erected on the side of the wall on which facing work occurs. Scaffolding shall not be built into any finish facing material.

I. Temporary Fire Protection: Construction practices, including cutting and welding, and fire protection during construction shall be in accordance with applicable requirements of Federal, State, and Local laws and codes.

1. Gasoline and other flammable liquids shall be stored in Underwriters Laboratories listed safety containers. Storage shall not be permitted within the building. All storage shall be in accordance with applicable requirements of Federal, State, and local laws and codes.
2. During all gas burning or welding operations within or on the building, furnish fire watch with portable fire extinguisher available. Maintain fire watch for minimum two hours after such operations have ended, unless directed otherwise.
3. Do not smoke or light fires of any kind in or about the premises. Prohibit the use of salamanders and other open flames within building.

4. All tarpaulins that may be used for any purpose during the construction of the Work shall be made of material which is resistant to fire, water, and weather.
5. The Contractor shall schedule the Work so that the permanent fire protection system shall be installed and made operable at the earliest possible date. At such time, the Contractor shall furnish sufficient hose to provide adequate coverage of each floor in the event of fire.
6. Contractor shall also furnish adequate portable fire extinguishers of type and adequate size.

1.6 DIGITAL CAMERA

A. Contractor shall furnish and maintain a digital camera with a minimum sensor size of 4.0 megapixels, and an image resolution of not less than 1024 by 768 pixels for his superintendent's use for the duration of the Project. Furnish Architect with photographs when so directed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Architect. Provide materials suitable for use intended.

B. Water: Potable.

2.2 EQUIPMENT

A. General: Provide equipment suitable for use intended.

B. Field Offices: Mobile units with lockable entrances, operable windows, and serviceable finishes; heated and air conditioned; on foundations adequate for normal loading.

1. Provide a walking, driving, and parking surface around and to field offices which will reduce contact with mud.

C. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.

1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

D. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

E. Drinking-Water Fixtures: Containerized, tap-dispenser, bottled-water drinking-water units, including paper cup supply.

F. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.

G. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Connect to existing electrical service in accordance with electrical code and authorities having jurisdiction.

B. Sewers and Drainage: Connect new sewers to existing sanitary sewer system in accordance with plumbing code and authorities having jurisdiction.

C. Water Service: Install new water service in accordance with plumbing code and authorities having jurisdiction.

3.3 RELOCATION AND REMOVALS

A. Relocate temporary services and facilities as required by progress of construction, by storage or work requirements, and to accommodate legitimate requirements of Owner and other contractors employed at the Site.

B. Completely remove temporary services and facilities when their use is no longer required.

3.4 CLEANING AND REPAIR

A. Clean and repair damage caused by temporary services and facilities to new condition for specified work and to a condition as good as or better than existed prior to start of work for existing construction, services, and facilities.

END OF SECTION

# SECTION 01 60 00 - PRODUCT REQUIREMENTS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes the following administrative and procedural requirements:

1. Selection of products for use in Project; product.
2. Delivery, storage, and handling.
3. Manufacturers' standard warranties on products and special warranties.
4. Product options, substitutions, and comparable products.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term “product” includes the terms “material,” “equipment,” “system,” and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Basis-of-Design Product Specification: Where a specific manufacturer's product is named and accompanied by the words “basis of design,” including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other named manufacturers.

D. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

E. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.4 SUBMITTALS

A. Substitution Requests: Submit one electronic copy of each request for consideration. No faxes will be accepted. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form approved by Architect.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified material or product cannot be provided.
b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.

l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

a. Form of Acceptance: Change Order.
b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

B. Product List: Submit a list, in tabular from, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
2. Form: Tabulate information for each product under the following column headings:

a. Specification Section number and title.
b. Generic name used in the Contract Documents.
c. Proprietary name, model number, and similar designations.
d. Manufacturer's name and address.
e. Supplier's name and address.
f. Installer's name and address.
g. Projected delivery date or time span of delivery period.
h. Identification of items that require early submittal approval for scheduled delivery date.

3. Completed List: Within 30 days after date of commencement of the Work, submit one electronic copy of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
4. Architect's Action: Architect will respond in writing to Contractor within 15 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement that products comply with the Contract Documents.

C. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section “Submittal Procedures.” Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
5. Store products to allow for inspection and measurement of quantity or counting of units.
6. Store materials in a manner that will not endanger Project structure.
7. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
9. Protect stored products from damage.

B. Storage: Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Refer to Divisions 02 through 49 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section “Closeout Procedures”.

PART 2 - PRODUCTS

2.1 PRODUCT OPTIONS

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged, and unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term “as selected,” Architect will make selection.
5. Where products are accompanied by the term “match sample,” sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish “salient characteristics” of products.
7. Or Equal: Where products are specified by name and accompanied by the term “or equal” or “or approved equal” or “or approved,” comply with provisions in “Comparable Products” Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures: Procedures for product selection include the following:

1. Product:

    a. Where Specification paragraphs or subparagraphs titled “Product” name a single product and manufacturer, provide the product named.
    b. Substitutions will not be considered, unless otherwise indicated.

2. Manufacturer/Source:

    a. Where Specification paragraphs or subparagraphs titled “Manufacturer” or “Source” name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.
    b. Substitutions will not be considered, unless otherwise indicated.

3. Products:

    a. Where Specification paragraphs or subparagraphs titled “Products” introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
    b. Substitutions will not be considered, unless otherwise indicated.

4. Manufacturers:

    a. Where Specification paragraphs or subparagraphs titled “Manufacturers” introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
    b. Substitutions will not be considered, unless otherwise indicated.

5. Available Products: Where Specification paragraphs or subparagraphs titled “Available Products” introduce a list of names of both products and manufacturers, provide one of the products listed or another product that complies with requirements. Comply with provisions in “Comparable Products” Article to obtain approval for use of an unnamed product.
6. Available Manufacturers: Where Specification paragraphs or subparagraphs titled “Available Manufacturers” introduce a list of manufacturers' names, provide a product by one of the manufacturers listed or another manufacturer that complies with requirements. Comply with provisions in “Comparable Products” Article to obtain approval for use of an unnamed product.
7. Product Options: Where Specification paragraphs titled “Product Options” indicate that size, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide either the specific product or system indicated or a comparable product or system by another manufacturer. Comply with provisions in “Product Substitutions” Article.
8. Basis-of-Design Products:

    a. Where Specification paragraphs or subparagraphs titled “Basis-of-Design Product[s]” are included and also introduce or refer to a list of manufacturers' names, provide either the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with provisions in “Comparable Products” Article to obtain approval for use of an unnamed product.
    b. Substitutions will not be considered, unless otherwise indicated.

9. Visual Matching Specification:

    a. Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches satisfactorily.
    b. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents on “substitutions” for selection of a matching product.

10. Visual Selection Specification:

    a. Where Specifications include the phrase “as selected from manufacturer's colors, patterns, textures” or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.

b. Standard Range: Where Specifications include the phrase “standard range of colors, patterns, textures” or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.

c. Full Range: Where Specifications include the phrase “full range of colors, patterns, textures” or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.

## 2.2 PRODUCT SUBSTITUTIONS

A. Timing: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

B. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.
10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

## 2.3 COMPARABLE PRODUCTS

A. Where products or manufacturers are specified by name, submit the following, in addition to other required submittals, to obtain approval of an unnamed product:

1. Evidence that the proposed product does not require extensive revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.

2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION

Not Used

END OF SECTION

# SECTION 01 73 00 - EXECUTION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:

1. General installation of products.
2. Coordination of Owner-installed products.
3. Progress cleaning.
4. Starting and adjusting.
5. Protection of installed construction.
6. Correction of the Work.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 SUBMITTALS

A. Qualification Data: For land surveyor or professional engineer to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other specified information.

## PART 2 - PRODUCTS

Not Used

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Existing Utilities: The existence and location of utilities and construction indicated as existing are not guaranteed.

B. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

a. Description of the Work.
b. List of detrimental conditions, including substrates.
c. List of unacceptable installation tolerances.

d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

## 3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility Owner that is necessary to adjust, move, or relocate existing utility services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Architect and Owner not less than 2 days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without Owner's written permission.

C. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

E. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

## 3.3 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
4. Maintain minimum headroom clearance of 8 feet in spaces without a suspended ceiling.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.

G. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

## 3.4 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning

materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

1. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

H. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

I. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

J. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

K. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

## 3.5 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 01 Section “Quality Requirements”.

## 3.6 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.7 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 01 Section “Cutting and Patching.”

B. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

C. Restore permanent facilities used during construction to their specified condition.

D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

F. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

# SECTION 01 73 29 - CUTTING AND PATCHING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes procedural requirements for cutting and patching where indicated or required.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

### 1.4 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:

1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in the building’s appearance and other significant visual elements.
3. Products: List products to be used and firms or entities that will perform the Work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.
6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.5 QUALITY ASSURANCE

A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other sections.

B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.

B. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

3.3 PERFORMANCE

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Proceed with patching after construction operations requiring cutting are complete.

C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

   a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until the patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.

D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION

# SECTION 01 77 00 - CLOSEOUT PROCEDURES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if, any, apply to this Section.

### 1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion and Final Inspection procedures.
2. Post-occupancy inspection procedures.
3. Project Record Documents
4. Operation and maintenance manuals.
5. Warranties.
6. Instruction of Owner's personnel.
7. Final cleaning.

B. Related Sections: Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection to determine the date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

    a. Apply for and obtain from the Building Official a Temporary Certificate of Occupancy in the Owner's name.
    b. The Certificate is to be obtained and posted as required by the Building Official prior to the final inspection by the Owner.
    c. Temporary Certificate in lieu of a Certificate of Occupancy will be sufficient, as the Owner's prerequisite for his final inspection, only when his specific written approval has been obtained.

5. Prepare and submit one hard copy and one electronic PDF copy of Project Record Documents (As-Built Drawings) and send both copies to Architect, operation and maintenance manuals, Final Completion construction photographs,

damage or settlement surveys, property surveys, and similar final record information.

6. Deliver tools, keys, spare parts, extra materials, operation and maintenance manuals, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
15. Change all air conditioning filters and permit Owner or his representative to inspect.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting a final inspection to determine the date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section Payment Procedures.
2. Submit certified copy of Architect's Substantial Completion list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection:

1. Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
2. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: The General Contractor shall be responsible for transcribing and submission of punch list. Architect will walk the Project and assist General Contractor in the development of the list. Submit one electronic copy of list in Microsoft Word format. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize a list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor, where applicable.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

a. Project name.
b. Date.
c. Name of Architect.
d. Name of Contractor.
e. Page number.

1.7 POST-OCCUPANCY INSPECTION

A. Conduct a post-occupancy inspection of the Work in the company of the Owner's Representative and the Owner before expiration of the one-year correction period.

1. Schedule the post-occupancy inspection not later than 20 days before the end of the one-year correction period.
2. Provide not less than 5 day’s written notice to the Owner prior to the anticipated date of post-occupancy inspection.
3. Prepare a list of those portions of the Work found not to be in compliance with the Contract Documents by the Owner's Representative and the Owner and forward a copy of the list to the Owner.
4. Correct the Work to comply with the Contract Documents to the satisfaction of the Owner's Representative and the Owner.
5. The Contractor shall endeavor to correct the Work before the end of the one-year correction period. Where corrective Work cannot be completed in this time period, the Contractor shall be required to complete corrections within a reasonable time after the end of the one-year correction period.

B. The Contractor shall not be responsible for correction of Work which has been damaged because of neglect or abuse by the Owner nor shall the Contractor be responsible for the replacement of parts necessitated by normal wear in use.

1.8 PROJECT RECORD DOCUMENTS

A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

B. Record Drawings (As Built-Drawings): Maintain and submit one electronic copy in PDF format of Contract Drawings and Shop Drawings.

1. Mark Record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
b. Accurately record information in an understandable drawing technique.
c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
d. Subject to Architect’s approval, mark Contract Drawings showing actual physical conditions, completely and accurately.
e. Each sheet of the prints shall be certified as to correctness by the Contractor, and where any major portion of the Work is performed by a Subcontractor, the tracings reflecting said subcontract Work shall be properly countersigned by the Subcontractor. Certify record drawing prints as follows:

CERTIFIED CORRECT (3/8-inch high letters)
(Name of Subcontractor)

_____

By: _____

Date: _____

f. After all corrections, changes and deviations have been transferred to the prints, the Contractor shall submit the prints to the Architect for review and comments. If additional information is required, or if the drawings are incomplete, the Architect will return the prints to the Contractor for the required action. If the record drawings are complete, the Contractor shall, upon notice by the Architect, submit the record drawing prints to the Architect for delivery to the Owner.

2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.

3. Mark important additional information that was either shown schematically or omitted from original Drawings.
4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
5. Identify and date each Record Drawing; include the designation PROJECT RECORD DRAWING in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Note related to Change Orders, Record Drawings, and Product Data, where applicable.

D. Miscellaneous Record Submittals: Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

1.9 OPERATION AND MAINTENANCE MANUALS

A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:

1. Operation Data:

a. Emergency instructions and procedures.
b. System, subsystem, and equipment descriptions, including operating standards.
c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
d. Description of controls and sequence of operations.
e. Piping diagrams.

2. Maintenance Data:

a. Manufacturer's information, including list of spare parts.
b. Name, address, and telephone number of Installer or supplier.
c. Maintenance procedures.
d. Maintenance and service schedules for preventive and routine maintenance.
e. Maintenance record forms.

f. Sources of spare parts and maintenance materials.
g. Copies of maintenance service agreements.
h. Copies of warranties and bonds.

B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title OPERATION AND MAINTENANCE MANUAL, Project name, and subject matter of contents.

1.10 WARRANTIES

A. General:

1. All Work shall be warranted for one (1) year, except where longer warranties are specified in the individual specification sections. All warranties shall start from the date of Substantial Completion as determined by the Architect.
2. Execute warranties required by the Contract Documents in the Owner's name.
3. Warranties for materials, appliances, and equipment furnished by others and incorporated in the Work must be transferable/assignable to the Owner in such a manner that warranty provisions will be enforceable by the Owner.
4. Prior to making the application for final payment, collect and deliver all required warranties to the Architect for review and transmittal to the Owner.

B. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

C. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

D. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title WARRANTIES, Project name, and name of Contractor.

E. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3- EXECUTION

3.1 DEMONSTRATION AND TRAINING

A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Provide instructors experienced in operation and maintenance procedures.
2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
3. Schedule training with the Owner, through Architect, with at least seven days' advance notice.
4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline. Submit video of each training module to Owner for future training of Owner’s personnel. Include instruction for the following:

1. System design and operational philosophy.
2. Review of documentation.
3. Operations.
4. Adjustments.
5. Troubleshooting.
6. Maintenance.
7. Repair.

3.2 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and anti-pollution regulations.

B. Cleaning:

1. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with the manufacturer’s written instructions.
2. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.
    (1) Do not remove UL and similar labels, including mechanical and electrical nameplates.

l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
    (1) Do not paint over UL and similar labels, including mechanical and electrical nameplates.

m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, where applicable and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
n. Replace parts subject to unusual operating conditions.
o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
q. Clean ducts, blowers, and coils if units were operated without filters during construction.
r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by

hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

s. Leave Project clean and ready for occupancy.

t. Change all air conditioning filters and permit Owner or his representative to inspect.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

# SECTION 02 41 19 - SELECTIVE DEMOLITION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:

1. Selective demolition and removal of selected interior portions of existing building.
2. Repair procedures for selective demolition operations.
3. Removal of debris and legal disposal of debris off site.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

### 1.4 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

### 1.5 SUBMITTALS

A. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other specified information.

B. Proposed Dust-Control and Noise-Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for

their operation. Identify options if proposed measures are later determined to be inadequate.

C. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
2. Interruption of utility services.
3. Coordination for shutoff, capping, and continuation of utility services.
4. Use of existing elevators and stairs.
5. Locations of temporary partitions and means of egress.
6. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

D. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

E. Predemolition Photographs or Videotape: Show existing conditions of adjoining construction and site improvements, including finish surfaces that might be misconstrued as damage caused by selective demolition operations. Submit before Work begins.

1.6 QUALITY ASSURANCE

A. This Section outlines minimum standards and requirements for this Project. Refer to the Drawings and other Specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and Structural Engineer, and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.

C. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

D. Standards: Comply with ANSI A10.6 and NFPA 241.

E. Predemolition Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

1. Review methods and procedures related to selective demolition including, but not limited to, the following:

a. Inspect and discuss condition of construction to be selectively demolished.
b. Review structural load limitations of existing structure.
c. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.

d. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

1.7 PROJECT CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.

B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

1. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.

C. Owner assumes no responsibility for condition of areas to be selectively demolished.

1. Conditions existing at time of inspection for bid/proposal purpose will be maintained by Owner as far as practical.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. Storage or sale of removed items or materials on-site will not be permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void any existing warranties.

PART 2 - PRODUCTS

1.1 REPAIR MATERIALS

A. Use repair materials identical to existing materials.

1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

2. Use materials whose installed performance equals or surpasses that of existing materials.

B. Comply with material and installation requirements specified in individual Specification Sections.

1.2 OTHER MATERIALS

A. Provide other materials, not specifically described, but required for a complete and proper installation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

F. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 UTILITY SERVICES

A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.

B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.

1. Provide at least 72 hours' notice to Owner if shutdown of service is required during changeover.

C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated utilities when requested by Contractor.
2. Arrange to shut off indicated utilities with utility companies.
3. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to other parts of building.
4. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.
5. Refer to Division 22 and 26 Sections for shutting off, disconnecting, removing, and sealing or capping utilities.
6. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

## 3.3 PREPARATION

A. Dangerous Materials: Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
2. Erect temporary protection, railings, and covered passageways, where required by authorities having jurisdiction.

C. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.

D. Temporary Enclosures: Provide temporary enclosures for protection of existing building and construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

E. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

F. Temporary Shoring: Provide and maintain interior shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of construction to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

## 3.4 POLLUTION CONTROLS

A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.

1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
2. Wet mop floors to eliminate trackable dirt and wipe down walls and doors of demolition enclosure. Vacuum carpeted areas.

B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

## 3.5 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods that is least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
8. Dispose of demolished items and materials promptly.
9. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.

B. Existing Facilities: Comply with Owner's requirements for using and protecting existing elevators, stairs, walkways, loading docks, building entries, and other building facilities during selective demolition operations.

C. Removed and Salvaged Items: Comply with the following:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area on-site or designated by Owner.
5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items: Comply with the following:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

F. Concrete: Demolish in small sections. Cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain, using power-driven saw. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete indicated for selective demolition. Neatly trim openings to dimensions indicated.

G. Masonry: Demolish in small sections. Cut masonry at junctures with construction to

remain, using power-driven saw, then remove masonry between saw cuts.

H. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI-WP and its Addendum.

1. Remove residual adhesive and prepare substrate for new floor coverings by one of the methods recommended by RFCI.

I. Air-Conditioning Equipment: If removal of equipment is indicated or required, remove equipment without releasing refrigerants.

## 3.6 PATCHING AND REPAIRS

A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.

B. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.

C. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

D. Floors and Walls: Where walls or partitions that are demolished extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

1. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
2. Where patching occurs in a painted surface, apply primer and intermediate paint coats over patch and apply final paint coat over entire unbroken surface containing patch. Provide additional coats until the patch blends with adjacent surfaces.
3. Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

E. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

## 3.7 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

B. Disposal: Transport demolished materials and legally dispose of them off Owner’s property.

END OF SECTION

# SECTION 03 35 00 - SEALED CONCRETE

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes concrete liquid densifier sealer application on exposed interior concrete floors where scheduled.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product List: List manufacturer name and product name for each product proposed for use as concrete admixture and surface treatment.

C. Manufacturer Certificate: Indicating products listed on Contractor's Product List are compatible and suitable for the specified application.

### 1.4 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to the Drawings, and other Specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Manufacturer's Qualifications: ISO 9001 quality certified as primary manufacturer of specified products.

C. Manufacturer Single Source: Provide liquid densifier sealer and related concrete treatment and admixture products from a single qualified manufacturer.

D. Pre-installation Conference: Conduct pre-installation conference at Project site to comply with Division 01 Section “Project Management and Coordination”.

### 1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Store materials in clean, dry area in accordance with manufacturer's instructions. Keep containers sealed until ready for use. Keep from freezing.

C. Protect materials during handling and application to prevent damage or contamination.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not apply sealer when concrete or air temperatures are below or above manufacturer's recommended application temperatures.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Specifications are based on the specified product, or Architect approved equal. Other manufacturers must have a minimum of five (5) years of experience manufacturing equivalent products to those specified and comply with Division 01 Section “Product Requirements” regarding substitutions to be considered.

2.2 LIQUID FLOOR TREATMENT

A. F14:

1. Description: Sealed Concrete
2. Location: Holding Cells, Prisoner Areas, and Janitor
3. Manufacturer: The Euclid Chemical Co.
4. Style: “Euco Diamond Hard”
5. Color: Clear

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine new or existing concrete surfaces, as applicable, to receive liquid densifier sealer. Notify Architect if surfaces are not acceptable or do not comply with manufacturer's recommendations.

B. Do not begin surface preparation or application until unacceptable conditions are corrected.

3.2 PREPARATION

A. Protect adjacent surfaces from overspray.

B. New Concrete: Ensure concrete is cured, clean, and dry in accordance with manufacturer's instructions.

C. Existing Concrete: When used on existing concrete, prepare concrete surfaces in accordance with manufacturer’s written instructions.

1. Ensure surfaces are clean, dry, and free of standing water.
2. Remove dirt, dust, oil, grease, sealers, and other materials that may prevent penetration of liquid densifier sealer.

3.3 APPLICATION

A. Apply Liquid Densifier Sealer in strict accordance with the directions of the manufacturer. Spray, squeegee, or roll on liquid to clean, dry concrete surface at a rate no greater than 225 sq. ft. per gallon. The liquid shall be scrubbed into the surface with a mechanical scrubber. Keep the surface wet for a minimum of 30 minutes with the Liquid Densifier Sealer during the application process. When the product thickens, but not more than 60 minutes after initial application, the surface shall then be squeegeed or vacuumed to remove all excess liquid.

1. Do not leave excess sealer residue on the surface.
2. Do not track material on to untreated surface.

3.4 PROTECTION

A. Protect sealed surfaces from traffic until the sealer has cured.

B. Remove protection from adjacent surfaces and sealer from surfaces which are not to receive sealer

END OF SECTION

# SECTION 05 05 10 - TAMPER-PROOF METAL FASTENERS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes the following:

1. Removable and non-removable tamper-proof metal fasteners.
2. Thread adhesive.
3. Tools for installation and removal.
4. McGard “Intimidator” at all exterior locations.

B. Tamper-proof metal fasteners shall be used for all exposed fasteners for grilles, frames, hardware, mechanical items, electrical items, millwork, equipment, and all other exposed items in all rooms and areas exposed to inmates.

C. Tamper-proof metal fasteners shall be used for all exposed fasteners in Corridors 00012 and 00104, Elevators 3, 5, 6, and 7 and their associated lobbies, including Future Elevator Lobby 00024, areas accessible to inmates in all rooms, whether or not indicated on the Drawings, except Courtrooms.

D. Tamper-proof metal fasteners are NOT REQUIRED in the following rooms and areas:

1. Administration office areas, all mechanical, data, and electrical rooms, all control and security equipment rooms.

E. All other rooms and areas not listed above shall receive tamper-proof metal fasteners.

F. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 DEFINITIONS

A. Tamper-Proof Fasteners: designer approved corrosion-resistant, hardened, high-strength, plated or stainless steel metal fasteners of size and type best suited for intended applications. Removable types shall have head designed requiring special tool of controlled availability for removal.

### 1.4 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: Submit for each type of tamper-proof fastener. Indicate materials, finish, head design, strength, corrosion resistance, and installation/removal methods.

C. Samples: Submit four (4) samples of each type of tamper-proof fastener proposed for use.

1.5 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to the Drawings, and other sections of the specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected. Failure to do so will not relieve the Contractor from performing the Work correctly at no additional expense to the Owner.

B. Manufacturer: company regularly engaged in the manufacturing of products of the type specified with a minimum of five (5) years of experience.

C. The structural capacity of the tamper-proof fasteners shall in every instance be equal to or greater than the physical properties of the fastening devices recommended by the manufacturer of the product to be installed. The contractor is responsible for ascertaining that the replacement of the recommended fastening device with the tamper-proof fasteners will not adversely affect the anchorage, the performance, the warranty, or other aspects of the products anchored or assembled in this manner.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Immediately upon delivery to job site, place materials in area protected from weather and secure against theft. Check delivered quantities and verify with bill of lading. Develop an inventory list for each size and type of fastener and installing tool. Record location of use, size and quantity used, tool used, and name of installer for each application. Be responsible for control of inventory and account for every fastening device and installing tool during use. Submit this record with final payment request.

B. The Contractor shall assign a full-time staff member at the job site to control use of special installing tools. These tools will be signed-out to workers requiring their use and signed-in when work is completed, on a daily basis. Cooperate with the Construction Manager in maintaining control of tools.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Removable Fasteners:

1. Pinned "Torx" fasteners including, but not limited to screws, bolts and nuts.
2. Pinned "Torx" head socket fasteners.
3. McGard “Intimidator” at all exterior locations.
4. Malleable Iron: ASTM A 47.

B. Non-Removable Fasteners:

1. Twist-off head type, dressed smooth.
2. Allen or similar recessed drive type, drilled to remove drive surfaces, filled with body putty.
3. Round head with one-way tapping.

C. Fasteners shall be strong enough to withstand required torque for proper installation.

2.2 ACCESSORIES

A. Tools: provide ten (10) sets of manual drive tools required for installation and removal of all removable tamper-proof fasteners on project. Package each set in an individual kit and deliver to the Owner.

B. Screw-thread Adhesive Sealant: Loctite No. 271 or Architect acceptable substitute.

C. Obtain a receipt from the Architect upon turning over the required tools; this receipt is to be submitted with the final payment request.

2.3 FABRICATION

A. Fabricate removable tamper-proof fasteners to allow removal only by tools produced by fastener manufacturer or other licensed fabricator specifically for individual tamper-proof design.

B. Plating: Cadmium, zinc, nickel, phosphate and chrome to match adjacent materials.

C. Limit size and shape variations such that no more than six (6) different tools are required for each type of tamper-proof fastener used on the project.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install work using properly sized security fastener, matched to configuration, structural loading, and size of original fastener to be replaced.

B. Do not discard fasteners; return excess to inventory. Return and record damage or unusable items on inventory list.

C. During the time the special installing tools are signed out to installers, the contractor is responsible for tools including securing tools during periods when tool is not in actual use.

D. The Contractor shall store and maintain inventory control for each installing tool used for installation of security fasteners. After use, installers shall return tools to institution inventory control. At completion of the project, all of the special installing tools shall be turned over to the Owner.

E. Install all fasteners with the proper amount of torque as recommended by the manufacturer.

F. Provide all items and accessories as required for a complete installation in every respect.

G. Use tamper-proof metal fasteners at all exposed locations in Corridors 00012 and 00104, Elevators 3, 5, 6, and 7 and their associated lobbies, including Future Elevator Lobby 00024, areas accessible to inmates. Tamper-proof metal fasteners are not required in Courtrooms.

END OF SECTION

# SECTION 05 40 00 - COLD-FORMED METAL FRAMING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes the load-bearing wall framing and ceiling framing, as applicable.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site in accordance with Division 01 Section “Project Management and Coordination”.

### 1.4 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For each type of cold-formed metal framing product and accessory indicated.

C. Shop Drawings:

1. Include layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners.
2. Show reinforcing channels, opening framing, supplemental framing, strapping, bracing, bridging, splices, accessories, connection details, and attachment to adjoining work.

    a. For cold-formed metal framing indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

D. Delegated-Design Submittal: For cold-formed steel framing.

### 1.5 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to the Drawings, and other Specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.

C. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel".

D. AISI Specifications and Standards: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" and its "Standard for Cold-Formed Steel Framing - General Provisions".

1. Comply with AISI's "Standard for Cold-Formed Steel Framing - Truss Design".

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering cold-formed metal framing that may be incorporated into the Work include, but are not limited to, the following:

1. ClarkDietrich Building Systems.
2. MarinoWare; a division of Ware Industries.
3. SCAFCO Corporation.

2.2 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Division 01 Section "Quality Requirements," to design cold-formed steel framing.

B. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads within limits and under conditions indicated.

1. Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:

a. Interior Load-Bearing Wall Framing: Horizontal deflection of 1/240 of the wall height under a horizontal load of 5 lbf/sq. ft.
b. Ceiling Joist Framing: Vertical deflection of 1/120 of the span for live loads and 1/240 for total loads of the span.

2. Design framing system to maintain clearances at openings, to allow for construction tolerances, and to accommodate live load deflection of primary building structure as follows:

a. Upward and downward movement of 1/2 inch.

C. Cold-Formed Steel Framing Design Standards:

1. Wall Studs: AISI S211.
2. Headers: AISI S212.
3. Lateral Design: AISI S213.

D. AISI Specifications and Standards: Unless more stringent requirements are indicated, comply with AISI S100 and AISI S200.

E. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of the applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

## 2.3 COLD-FORMED STEEL FRAMING, GENERAL

A. Steel Sheet: ASTM A 1003, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:

1. Grade: As required by structural performance.
2. Coating: G60 or equivalent.

B. Steel Sheet for Vertical Deflection Clips: ASTM A 653, structural steel, zinc coated, of grade and coating as follows:

1. Grade: As required by structural performance.
2. Coating: G60.

## 2.4 LOAD-BEARING WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0329 inch.
2. Flange Width: 1-3/8 inches, unless indicated otherwise.

## 2.5 CEILING JOIST FRAMING

A. Steel Ceiling Joists: Manufacturer's standard C-shaped steel sections, of web depths indicated, unpunched with stiffened flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0329 inch.
2. Flange Width: 1-5/8 inches, unless indicated otherwise.

## 2.6 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories from steel sheet, ASTM A 1003, Structural Grade, Type H, metallic coated, of same grade and coating weight used for framing members.

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated. Accessories may include:

1. Supplementary framing.
2. Bracing, bridging, and solid blocking.
3. Web stiffeners.
4. Anchor clips.
5. Foundation clips.
6. Stud kickers, knee braces, and girts.
7. Hole reinforcing plates.
8. Backer plates.

## 2.7 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36, zinc coated by hot-dip process according to ASTM A 123.

B. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

C. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.

D. Mechanical Fasteners: ASTM C 1513, corrosion-resistant-coated, self-drilling, self-tapping steel drill screws.

1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

E. Welding Electrodes: Comply with AWS standards.

## 2.8 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: ASTM A 780.

B. Shims: Load bearing, high-density multimonomer plastic, nonleaching.

C. Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to match width of bottom track or rim track members.

2.9 FABRICATION

A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to referenced AISI's specifications and standards, manufacturer's written instructions, and requirements in this Section.

1. Fabricate framing assemblies using jigs or templates.
2. Cut framing members by sawing or shearing; do not torch cut.
3. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting as standard with fabricator. Wire tying of framing members is not permitted.

a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.

4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing, or other finishing materials.
2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Install load bearing shims between the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations to ensure a uniform bearing surface on supporting concrete or masonry construction.

B. Install sealer gaskets to isolate the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION

A. General:

1. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.
2. Install cold-formed metal framing according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions" and to manufacturer's written instructions unless more stringent requirements are indicated.
3. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.

    a. Screw, bolt, or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch.

4. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened.

    a. Cut framing members by sawing or shearing; do not torch cut.
    b. Fasten cold-formed metal framing members by welding, screw fastening, clinch fastening, or riveting. Wire tying of framing members is not permitted.
        1) Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
        2) Locate mechanical fasteners and install according to Shop Drawings, and complying with requirements for spacing, edge distances, and screw penetration.

5. Install framing members in one-piece lengths unless splice connections are indicated for track or tension members.
6. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until the entire integrated supporting structure has been completed and permanent connections to framing are secured.
7. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.
8. Install insulation, specified in Division 07 Section "Thermal Insulation", in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
9. Fasten hole reinforcing plate over web penetrations that exceed the size of manufacturer's standard punched openings.
10. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

    a. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing, or other finishing materials.

B. Joist Installation:

1. Install perimeter joist track sized to match joists. Align and securely anchor or fasten track to supporting structure at corners, ends, and spacings indicated on Shop Drawings.
2. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten joists to both flanges of joist track.
3. Space joists not more than 2 inches from abutting walls, and as follows:

    a. Joist Spacing: As indicated.

4. Frame openings with built-up joist headers consisting of joist and joist track, nesting joists, or another combination of connected joists if indicated.
5. Install joist reinforcement at interior supports with single, short length of joist section located directly over interior support, with lapped joists of equal length to joist reinforcement, or as indicated on Shop Drawings.

    a. Install web stiffeners to transfer axial loads of walls above.

6. Install one of the following types of bridging at intervals indicated on Shop Drawings. Fasten bridging at each joist intersection:

    a. Joist-track solid blocking of width and thickness indicated, secured to joist webs.
    b. Combination of flat, taut, steel sheet straps of width and thickness indicated, and joist-track solid blocking of width and thickness indicated. Fasten flat straps to the bottom flange of joists and secure solid blocking to joist webs.

7. Secure joists to load-bearing interior walls to prevent lateral movement of bottom flange.
8. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

## 3.4 FIELD QUALITY CONTROL

A. Testing: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Field and shop welds will be subject to testing and inspecting.

C. The testing agency will report test results promptly and in writing to Contractor and Architect.

D. Remove and replace work where test results indicate that it does not comply with specified requirements.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

## 3.5 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer that ensure that cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION

# SECTION 05 50 00 - METAL FABRICATIONS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:

1. Steel framing and support for mechanical and electrical equipment.
2. Steel framing and supports for applications where framing and supports are not specified in other Sections, such as ceiling hung toilet partitions, and other items as applicable.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work

### 1.3 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For the following:

1. Paint products.

C. Shop Drawings: Detail fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

1. Provide templates for anchors and bolts specified for installation under other Sections.

D. Welding Certificates: Copies of certificates for welding procedures and personnel.

E. Qualification Data: For firms and persons specified in “Quality Assurance” Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other specified information.

### 1.4 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to the Drawings, and other Specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel".
2. AWS D1.2, "Structural Welding Code--Aluminum".
3. AWS D1.3, "Structural Welding Code--Sheet Steel".
4. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.5 PROJECT CONDITIONS

A. Field Measurements:

1. Where metal fabrications are indicated to fit walls and other construction, verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal fabrications without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions. Allow for trimming and fitting.

1.6 COORDINATION

A. Coordinate installation of steel weld plates and angles for casting into concrete that are specified in this Section but required for work of another Section. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Nonferrous Metals:

1. Aluminum Plate and Sheet: ASTM B 209, Alloy 6061-T6.
2. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.

C. Ferrous Metals:

1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
2. Steel Tubing: Cold-formed steel tubing complying with ASTM A 500.
3. Steel Pipe: ASTM A 53, standard weight (Schedule 40), unless another weight is indicated or required by structural loads.
4. Slotted Channel Framing: Cold-formed metal channels with flange edges returned toward web and with 9/16-inch- wide slotted holes in webs at 2 inches o.c.

a. Width of Channels: 1-5/8 inches.
b. Depth of Channels: 1-5/8 inches, unless indicated otherwise.
c. Metal and Thickness: Galvanized steel complying with ASTM A 653, structural quality, Grade 33, with G90 coating; 0.079-inch nominal thickness.
d. Finish: Rust-inhibitive, baked-on, acrylic enamel, unless indicated otherwise.

5. Malleable-Iron Castings: ASTM A 47, Grade 32510.
6. Gray-Iron Castings: ASTM A 48, Class 30, unless another class is indicated or required by structural loads.

D. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

2.2 PAINT

A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.

1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

B. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.

C. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.3 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 5, at exterior walls. Provide stainless-steel fasteners for fastening aluminum. Select fasteners for type, grade, and class required.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A; with hex nuts, ASTM A 563; and, where indicated, flat washers.

C. Anchor Bolts: ASTM F 1554, Grade 36.

1. Provide hot-dip or mechanically deposited, zinc-coated anchor bolts where item being fastened is indicated to be galvanized.

D. Eyebolts: ASTM A 489.

E. Machine Screws: ASME B18.6.3.

F. Lag Bolts: ASME B18.2.1.

G. Wood Screws: Flat head, ASME B18.6.1.

H. Plain Washers: Round, ASME B18.22.1.

I. Lock Washers: Helical, spring type, ASME B18.21.1.

J. Cast-in-Place Anchors in Concrete: Anchors capable of sustaining, without failure, a load equal to four times the load imposed, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27 cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized per ASTM A 153/A 153M.

K. Expansion Anchors: Anchor bolt and sleeve assembly with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

1. Material: Alloy Group 1 or 2 stainless-steel bolts complying with ASTM F 593 and nuts complying with ASTM F 594.

L. Toggle Bolts: FS FF-B-588, tumble-wing type, class and style as needed.

## 2.4 GROUT

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

## 2.5 FABRICATION

A. General:

1. Shop Assembly: Preassemble items in shop to the greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
2. Shear and punch metals cleanly and accurately. Remove burrs.
3. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
4. Weld corners and seams continuously to comply with the following:

a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
b. Obtain fusion without undercut or overlap.
c. Remove the welding flux immediately.

d. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

5. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
6. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
7. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
8. Remove sharp or rough areas on exposed traffic surfaces.
9. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.

B. Miscellaneous Framing and Supports: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

1. Fabricate units from steel shapes, plates, and bars of welded construction, unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction retained by framing and supports. Cut, drill, and tap units to receive hardware, hangers, and similar items.

a. Fabricate units from slotted channel framing where indicated.
b. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors 1-1/4 inches wide by 1/4 inch thick by 8 inches long at 24 inches o.c., unless otherwise indicated.
c. Furnish inserts if units must be installed after concrete is placed.

2. Galvanize miscellaneous framing and supports where indicated.

C. Miscellaneous Steel Trim: Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

1. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work. Provide anchors, welded to trim, for embedding in concrete or masonry construction, spaced not more than 6 inches from each end, 6 inches from corners, and 24 inches o.c., unless otherwise indicated.
2. Galvanize miscellaneous steel trim in the following locations:

a. Interior, where indicated.

## 2.6 FINISHES

A. General:

1. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

2. Finish metal fabrications after assembly.

B. Steel and Iron Finishes:

1. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:

a. ASTM A 123, for galvanizing steel and iron products.
b. ASTM A 153, for galvanizing steel and iron hardware.

2. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

a. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning".

3. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes and those to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1", for shop painting.

a. Stripe paint corners, crevices, bolts, welds, and sharp edges.

## 2.7 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

B. As-Fabricated Finish: AA-M10 (Mechanical Finish: as fabricated, unspecified).

C. Class I, Clear Anodic Finish: AA-M12C22A41 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.

# PART 3 - EXECUTION

## 3.1 INSTALLATION

A. General:

1. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors.
2. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
3. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

4. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
5. Field Welding: Comply with the following requirements:

    a. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
    b. Obtain fusion without undercut or overlap.
    c. Remove the welding flux immediately.
    d. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

B. Installing Miscellaneous Framing And Supports:

1. General: Install framing and support to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings, if any.

## 3.2 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

END OF SECTION

# SECTION 06 10 00 - ROUGH CARPENTRY

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes wood blocking, cants, and nailers where indicated or required.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 DEFINITIONS

A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise indicated.

### 1.4 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials, both before and after exposure to elevated temperatures when tested according to ASTM D 5516 and ASTM D 5664.
3. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
4. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

C. Research/Evaluation Reports: For the following, showing compliance with the building code in effect for Project:

1. Wood-preservative-treated wood
2. Fire-retardant-treated wood.

1.5 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to the Drawings, and other Specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

C. Source Limitations for Wood-Preservative-Treated Wood and Fire-Retardant-Treated Wood: Obtain each type of treated wood product through one source from a single producer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation. Provide air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with the grade stamp of the grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWPA C2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat all miscellaneous carpentry, unless otherwise indicated.

1. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete

## 2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, provide materials that comply with performance requirements in AWPA C27 (plywood). Identify fire-retardant-treated wood with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Use treatment for which chemical manufacturer publishes physical properties of treated wood after exposure to elevated temperatures, when tested by a qualified independent testing agency according to ASTM D 5516, for plywood.
2. Use treatment that does not promote corrosion of metal fasteners.
3. Use Interior Type A High Temperature (HT), unless otherwise indicated.

## 2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 15 percent maximum moisture content and any of the following species:

1. Mixed southern pine; SPIB.
2. Western woods; WCLIB or WWPA.

C. For concealed boards, provide lumber with 15 percent maximum moisture content and any of the following species and grades:

1. Mixed southern pine, No. 2 grade; SPIB.
2. Spruce-pine-fir (south) or spruce-pine-fir, Construction or 2 Common.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

## 2.5 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153.

B. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

C. Lag Bolts: ASME B18.2.1.

D. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. General:

1. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit.
2. Do not use materials with defects that impair the quality of rough carpentry or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
3. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.

B. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

C. Securely attach carpentry work to substrate by anchoring and fastening to comply with the building code.

### 3.2 WOOD BLOCKING AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

END OF SECTION

# SECTION 06 41 00 - INTERIOR ARCHITECTURAL WOODWORK

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:

1. Finish Carpentry
2. Millwork
3. Plastic laminate material.
4. Quartz surface material.
5. Closet and utility shelving.
6. Shop finishing interior woodwork.

B. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

C. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For each type of product indicated, including cabinet hardware and accessories and finishing materials and processes.

C. Product Data: For panel products, high-pressure decorative laminate, adhesive for bonding plastic laminate, quartz surface materials, cabinet hardware and accessories, and finishing materials and processes.

D. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show details full size.
2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
3. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers, and other items installed in architectural woodwork.
4. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.

E. Samples for Initial Selection:

1. Shop-applied transparent finishes.
2. Shop-applied opaque finishes.
3. Plastic laminates.
4. Quartz surface materials.

F. Samples for Verification:

1. Lumber with or for transparent finish, not less than 5 inches wide by 24 inches long, for each species and cut, finished on 1 side and 1 edge.
2. Veneer leaves representative of and selected from flitches to be used for transparent-finished woodwork.
3. Veneer-faced panel products with or for transparent finish, 12 by 24 inches, for each species and cut. Include at least one face-veneer seam and finish as specified.
4. Plastic laminates, 8 by 10 inches, for each type, color, pattern, and surface finish, with 1 sample applied to core material and specified edge material applied to 1 edge.
5. Quartz surface materials, 6 inches square.
6. Corner pieces as follows:
   a. Cabinet-front frame joints between stiles and rails, as well as exposed end pieces, 18 inches high by 18 inches wide by 6 inches deep.
   b. Miter joints for standing trim.
7. Exposed cabinet hardware and accessories, one unit for each type and finish.

G. Product Certificates: For each type of product, signed by product manufacturer.

H. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

I. Qualification Data: For Fabricator.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a certified participant in AWI's Quality Certification Program.

B. Installer Qualifications: Fabricator of products.

C. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of interior architectural woodwork with sequence-matched wood veneers and transparent-finished wood doors that are required to be of same species as woodwork.

D. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.

1. Provide AWI Quality Certification Program labels and certificates indicating that woodwork, including installation, complies with requirements of grades specified.

E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

## 1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in the “Project Conditions" Article.

## 1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install woodwork until the building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed and indicate measurements on Shop Drawings.
2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

## 1.7 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

B. Hardware Coordination: Distribute copies of approved hardware schedule specified in Division 08 Section "Finish Hardware" to fabricator of architectural woodwork; coordinate Shop Drawings and fabrication with hardware requirements.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide materials that comply with requirements of AWI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.

B. Wood Species and Cut for Transparent Finish: Plain Sawn Cherry to match Architect’s sample.

C. Wood Products: Comply with the following:

1. Hardboard: AHA A135.4.
2. Medium-Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.
3. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.
4. Softwood Plywood: DOC PS 1, Medium Density Overlay.
5. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1, made with adhesive containing no urea formaldehyde.

D. Wood Base (B1):

1. Description: Wood Base
2. Location: Court Rooms
3. Color: Cherry Stain
4. Size: 6 inches
5. Remarks: Match Architect’s sample.

E. Wood Veneer (V1):

1. Description: Wood Veneer
2. Location: Court Rooms and Vestibule
3. Style: Plain Sawn
   Remarks: Cherry wood veneer with stain to match Architect’s sample, refer to Interior Elevations.

F. Wood (Solid Stock) (V2):

1. Description: Wood (Solid Stock)
2. Location: Court Rooms and Vestibule
3. Style: Plain Sawn
4. Remarks: Cherry wood veneer with stain to match Architect’s sample.

G. Plastic Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.

1. PL1:
   a. Description: Plastic Laminate
   b. Location: Doors, Jury Work Room, Court Room Work Surface
   c. Manufacturer: Wilsonart Laminate
   d. Color: 7924-07 Biltmore Cherry

2. PL2:
   a. Description: Plastic Laminate
   b. Location: Break Room and Work Room
   c. Manufacturer: Wilsonart Laminate
   d. Color: 4844-60 Loden Zephyr
   e. Remarks: Counter and Backsplash

3. PL3:
   a. Description: Plastic Laminate
   b. Location: Break Room and Work Room
   c. Manufacturer: Wilsonart Laminate
   d. Color: Pepperdust
   e. Remarks: Cabinets

4. PL4:
   a. Description: Plastic Laminate
   b. Location: Bailiff and Clerk Millwork
   c. Manufacturer: Wilsonart Laminate
   d. Color: 4846-60 Morro Zephyr

H. Quartz-Surface Materials:

1. ST1
   a. Description: Quartz-Surface
      Location: Court Room Judge’s Bench, Spectator Bench, Jury Rail
   b. Manufacturer: Corian Quartz
   c. Color: Ironstone

## 2.2 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets, except for items specified in Division 8 Section "Finish Hardware".

B. Butt Hinges: 2-3/4-inch, 5-knuckle steel hinges made from 0.095-inch- thick metal, and as follows:

1. Semiconcealed Hinges for Flush Doors: BHMA A156.9, B01361.
2. Semiconcealed Hinges for Overlay Doors: BHMA A156.9, B01521.

C. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 100 degrees of opening, self-closing.

D. Back-Mounted Pulls: BHMA A156.9, B02011.

E. Wire Pulls: Back mounted, solid metal, 4 inches (100 mm) long, 5/16 inch in diameter.

F. Catches: Magnetic catches, BHMA A156.9, B03141; Push-in magnetic catches, BHMA A156.9, B03131; Roller catches, BHMA A156.9, B03071; Ball friction catches, BHMA A156.9, B03013.

G. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081, or BHMA A156.9, B04102; with shelf brackets, B04112.

H. Shelf Rests: BHMA A156.9, B04013; metal.

I. Drawer Slides: BHMA A156.9, B05091.

1. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-extension type; zinc-plated steel ball-bearing slides.
2. Box Drawer Slides: Grade 1HD-100; for drawers not more than 6 inches high and 24 inches wide.
3. File Drawer Slides: Grade 1HD-100; for drawers more than 6 inches high or 24 inches wide.
4. Pencil Drawer Slides: Grade 2; for drawers not more than 3 inches high and 24 inches wide.
5. Keyboard Slides: Grade 1; for computer keyboard shelves.
6. Trash Bin Slides: Grade 1HD-100; for trash bins not more than 20 inches high and 16 inches wide.

J. Door Locks: BHMA A156.11, E07121.

K. Drawer Locks: BHMA A156.11, E07041.

L. Grommets for Cable Passage through Countertops: 1-1/4-inch OD, molded-plastic grommets and matching plastic caps with slot for wire passage. Color as selected by Architect from manufacturer’s standard colors.

1. Product: Subject to compliance with requirements, provide "OG series" by Doug Mockett & Company, Inc.

M. Paper Slots: 12 inches, molded-plastic, paper-slot liner with 1/4-inch lip. Color as selected by Architect from manufacturer’s standard colors.

1. Product: Subject to compliance with requirements, provide "Model CP-2" by Doug Mockett & Company, Inc.

N. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated below as selected by Architect.

1. Satin Chromium Plated: BHMA 626 for brass or bronze base; BHMA 652 for steel base.
2. Satin Stainless Steel: BHMA 630.

O. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.3 FABRICATION, GENERAL

A. Interior Woodwork Grade: Unless otherwise indicated, provide Custom-grade interior woodwork complying with referenced quality standard.

B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:

1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members 3/4 Inch Thick or Less: 1/16 inch.
2. Edges of Rails and Similar Members More Than 3/4 Inch Thick: 1/8 inch.

D. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.

E. Shop-cut openings to the maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

1. Seal edges of openings in countertops with a coat of varnish.

2.4 WOOD CABINETS FOR TRANSPARENT FINISH

A. Grade: Custom.

B. AWI Type of Cabinet Construction: Flush overlay or Reveal overlay as indicated.

C. Wood Species and Cut for Exposed Surfaces: Plain Sawn Cherry to match Architect’s sample.

1. Grain Direction: Match Architect’s approved sample.

D. Semi-exposed Surfaces: Provide surface materials indicated below:

1. Surfaces Other Than Drawer Bodies: Same species and cut indicated for exposed surfaces.
2. Drawer Sides and Backs: Solid-hardwood lumber, same species indicated for exposed surfaces.
3. Drawer Bottoms: Hardwood plywood.

## 2.5 PLASTIC-LAMINATE CABINETS

A. Grade: Custom, unless indicated otherwise.

B. AWI Type of Cabinet Construction: As indicated.

C. Reveal Dimension: As indicated.

D. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:

1. Horizontal Surfaces Other Than Tops: Grade HGS.
2. Postformed Surfaces: Grade HGP.
3. Vertical Surfaces: Grade HGS.
4. Edges: Grade HGS.

E. Materials for Semiexposed Surfaces:

1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, Grade VGS.

a. Edges of Plastic-Laminate Shelves: Self-edge matching laminate in color, pattern, and finish.
b. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, Grade VGS.

2. Drawer Sides and Backs: Solid-hardwood lumber.
3. Drawer Bottoms: Hardwood plywood.

F. Concealed Backs of Panels with Exposed Plastic Laminate Surfaces: High-pressure decorative laminate, Grade BKL.

G. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with those indicated in Finish Schedule on Drawings.

H. Provide dust panels of 1/4-inch plywood or tempered hardboard above compartments and drawers, unless located directly under tops.

## 2.6 PLASTIC-LAMINATE COUNTERTOPS

A. Grade: Custom, unless indicated otherwise.

B. High-Pressure Decorative Laminate Grade: HGS.

C. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with those indicated in Paragraph 2.1, G or Finish Schedule on Drawings.

D. Edge Treatment: Same as laminate cladding on horizontal surfaces.

E. Core Material: Particleboard or medium-density fiberboard as indicated on Drawings.

F. Core Material at Sinks: Medium-density fiberboard made with exterior glue or exterior-grade plywood.

G. Backer Sheet: Provide plastic-laminate backer sheet, Grade BKL, underside of countertop substrate.

## 2.7 QUARTZ SURFACE COUNTERTOPS

A. Grade: Premium.

B. Material Thickness: As indicated on Drawings.

C. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed quartz surfaces complying with those indicated in Paragraph 2.1, H or Finish Schedule on Drawings.

D. Fabricate tops in one piece, unless otherwise indicated. Comply with material manufacturer's written recommendations for adhesives, sealers, fabrication, and finishing.

1. Fabricate tops with shop-applied edges of materials and configuration indicated.
2. Fabricate tops with shop-applied backsplashes or loose backsplashes for field application as indicated or required.

E. If integral sink bowls are indicated, install in countertops in shop.

F. Drill holes in countertops for plumbing fittings and soap dispensers in shop.

## 2.8 CLOSET AND UTILITY SHELVING

A. Grade: Custom.

B. Shelf Material: 3/4-inch solid lumber.

C. Cleats: 3/4-inch solid lumber.

D. Wood Species: Any closed-grain hardwood.

## 2.9 SHOP FINISHING

A. Grade: Provide finishes of the same grades as items to be finished.

B. General: Drawings indicate items that are required to be shop finished. Finish such items at fabrication shop as specified in this Section. Refer to Division 09 Painting Sections for finishing architectural woodwork not indicated to be shop finished.

C. Shop Priming: Shop apply the prime coat including backpriming, if any, for transparent-finished items specified to be field finished. Refer to Division 09 Painting Sections for material and application requirements.

D. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.

1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to the back of paneling and to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not require backpriming when surfaced with plastic laminate, backing paper, or thermoset decorative panels.

E. Transparent Finish:

1. Grade: Custom
2. AWI Finish System: Conversion varnish
3. Match Architect's sample.
4. Wash Coat for Stained Finish: Apply wash-coat sealer to woodwork made from closed-grain wood before staining and finishing.
5. Filled Finish for Open-Grain Woods: After staining (if any), apply paste wood filler to open-grain woods and wipe off excess. Tint filler to match stained wood.
6. Sheen: Match Architect's sample.

## PART 3 - EXECUTION

### 3.1 PREPARATION

A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.

B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

### 3.2 INSTALLATION

A. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.

B. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to the extent that it was not completed in the shop.

C. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.

D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.

F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.

1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
2. Maintain veneer sequence matching of cabinets with transparent finish.
3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c.

a. Use No. 10 wafer-head screws sized for 1-inch penetration into wood framing, blocking, or hanging strips.
b. Use No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.
c. Use toggle bolts through metal backing or metal framing behind the wall finish.

G. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.

1. Align adjacent quartz material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean the entire surface.
2. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
3. Secure backsplashes to tops with concealed metal brackets at 16 inches o.c. and to walls with adhesive.
4. Calk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants".

H. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.

I. Refer to Division 09 Section “Painting” for final finishing of installed architectural woodwork not indicated to be shop finished.

## 3.3 REPAIRING, ADJUSTING, AND CLEANING

A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where it is not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean woodwork on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION

# SECTION 07 21 00 - BUILDING INSULATION

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes sound attenuation batt insulation where indicated.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 CONTRACTOR'S RESPONSIBILITIES

A. As scope and performance documents, the Drawings and Specifications do not necessarily indicate or describe all the work required for building insulation and ensure that all penetrations, holes, gaps, joints, and openings through insulation materials shall be sealed to ensure continuity of building envelope whether indicated or not.

### 1.4 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures.

B. Product Data:

1. Manufacturer’s literature on each specified insulation type.
2. Manufacturer’s installation instructions for each insulation type specified.

### 1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Store insulation in clean, dry, sheltered area, off ground or floor, until used. Protect against wetting and moisture absorption.

## PART 2 - PRODUCTS

### 2.1 APPROVED MANUFACTURERS/PRODUCTS

A. Specifications are based on any one (1) of the following, or Architect approved equal. Other manufacturers must have a minimum of five (5) years experience manufacturing products meeting or exceeding the specifications and comply with Division 01 Section “Product Requirements” regarding substitutions to be considered.

1. Sound Attenuation Batt Insulation:

    a. CertainTeed Corp.
    b. Guardian Fiberglass, Inc.
    c. Johns-Manville
    d. Knauf
    e. Owens-Corning

2.2 MATERIALS

A. Sound-Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

B. Other Materials: Provide other materials, not specifically described, but required for a complete and proper installation.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that areas to receive insulation are completed and approved prior to installing insulation.

B. Correct unsatisfactory conditions before proceeding.

1. If conditions are the responsibility of another installer, notify Architect of unsatisfactory conditions before proceeding.

3.2 INSTALLATION

A. Install sound attenuation blankets in accordance with manufacturer's installation instructions.

B. Install in spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

END OF SECTION

# SECTION 07 84 13 - PENETRATION FIRESTOPPING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes through-penetration firestop systems for penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 PERFORMANCE REQUIREMENTS

A. General: For penetrations through the following fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.

1. Fire-resistance-rated walls including fire walls.
2. Fire-resistance-rated horizontal assemblies including floor/ceiling assemblies and roof/ceiling assemblies shall be protected by a fire-resistant joint sealant joint system tested in accordance with ASTM E 1966 or UL 2079.

B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per ASTM E 814 or UL 1479:

1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.
2. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:

    a. Penetrations located outside fire-resistance-rated shaft enclosures.

3. L-Rated Systems: Provide through-penetration firestop systems with L-ratings indicated, or if not indicated, of not more than 3.0 cfm/sq. ft at both ambient temperatures and 400 deg F.

C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.

1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
2. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or by other means.
3. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

D. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

## 1.4 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For each type of product indicated.

C. Shop Drawings: For each through-penetration firestop system, show each type of construction condition penetrated, relationships to adjoining construction, and type of penetrating item. Include firestop design designation of qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.

1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.
2. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular through-penetration firestop condition, submit illustration, with modifications marked, approved by through-penetration firestop system manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

C. Through-Penetration Firestop System Schedule: Indicate locations of each through-penetration firestop system, along with the following information:

1. Types of penetrating items.
2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.
3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.

D. Qualification Data: For Installer.

E. Product Certificates: For through-penetration firestop system products, signed by product manufacturer.

F. Product Test Reports: From a qualified testing agency indicating a through-penetration firestop system complies with requirements, based on comprehensive testing of current products.

1.5 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to the Drawings, and other Specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected

B. Installer Qualifications: A firm experienced in installing through-penetration firestop systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance.

C. Installation Responsibility: Assign installation of through-penetration firestop systems in Project to a single qualified installer.

D. Source Limitations: Obtain through-penetration firestop systems, for each kind of penetration and construction condition indicated, through one source from a single manufacturer.

E. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:

1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
2. Through-penetration firestop systems are identical to those tested per testing standard referenced in "Part 1 Performance Requirements" Article. Provide rated systems complying with the following requirements:

    a. Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.
    b. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by the following:
        1) UL in its "Fire Resistance Directory".

F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.

C. Notify Owner's inspecting agency at least seven days in advance of through-penetration firestop system installations; confirm dates and times on days preceding each series of installations.

D. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by Owner's inspecting agency and building inspector, if required by authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, through-penetration firestop systems that may be incorporated into the Work include, but are not limited to, those systems indicated on Drawings that are produced by one of the following manufacturers:

1. A/D Fire Protection Systems Inc.
2. Grace, W. R. & Co. - Conn.
3. Hilti, Inc.
4. Johns Manville.
5. Nelson Firestop Products.
6. NUCO Inc.
7. RectorSeal Corporation (The).
8. Specified Technologies Inc.
9. 3M; Fire Protection Products Division.
10. Tremco; Sealant/Weatherproofing Division.
11. USG Corporation.

2.2 FIRESTOPPING, GENERAL

A. Compatibility: Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.

B. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:

1. Permanent forming/damming/backing materials, including the following

    a. Slag-/rock-wool-fiber insulation.
    b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
    c. Fire-rated form board.
    d. Fillers for sealants.

2. Temporary forming materials.
3. Substrate primers.
4. Collars.
5. Steel sleeves.

2.3 FILL MATERIALS

A. General: Provide through-penetration firestop systems containing the types of fill materials indicated in the Through-Penetration Firestop System Schedule at the end of Part 3 by referencing the types of materials described in this Article. Fill materials are those referred to in directories of referenced testing and inspecting agencies as "fill," "void," or "cavity" materials.

B. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.

C. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.

D. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

E. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.

F. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

G. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

H. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

I. Pillows/Bags: Reusable heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents, and fire-retardant additives.

J. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

K. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and other surfaces requiring a nonslumping, gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.
2. Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.
3. Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

2.4 MIXING

A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean out openings immediately before installing through-penetration firestop systems to comply with firestop system manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.3 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

A. General: Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

## 3.4 IDENTIFICATION

A. Identify through-penetration firestop systems with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches of edge of the firestop systems so that labels will be visible to anyone seeking to remove penetrating items or firestop systems. Use mechanical fasteners for metal labels. For plastic labels, use self-adhering type with adhesives capable of permanently bonding labels to surfaces on which labels are placed and, in combination with label material, will result in partial destruction of label if removal is attempted. Include the following information on labels:

1. The words "Warning - Through-Penetration Firestop System - Do Not Disturb. Notify Building Management of Any Damage".
2. Contractor's name, address, and phone number.
3. Through-penetration firestop system designation of applicable testing and inspecting agency.
4. Date of installation.
5. Through-penetration firestop system manufacturer's name.
6. Installer's name.

## 3.5 FIELD QUALITY CONTROL

A. Inspecting Agency: Owner will engage a qualified, independent inspecting agency to inspect through-penetration firestops. Independent inspecting agency shall comply with ASTM E 2174 requirements including those related to qualifications, conducting inspections, and preparing test reports.

B. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.

C. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued and firestop installations comply with requirements.

## 3.6 CLEANING AND PROTECTING

A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

END OF SECTION

# SECTION 07 92 00 - JOINT SEALANTS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes interior sealants and caulking.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 SYSTEM PERFORMANCES

A. Provide joint sealants that have been produced and installed to establish and maintain continuous joint seals without staining or deteriorating joint substrates.

### 1.4 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For each joint-sealant product indicated.

C. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

D. Samples for Verification: For each type and color of joint sealant required. Install joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

E. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.

F. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other specified information.

G. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" Article.

H. Field Test Report Log: For each elastomeric sealant application. Include information specified in "Field Quality Control" Article.

I. Compatibility and Adhesion Test Reports: From sealant manufacturer indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

J. Product Test Reports: From a qualified testing agency indicating sealants comply with requirements, based on comprehensive testing of current product formulations.

K. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to the Drawings, and other Specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.

1. All interior exposed-to-view sealants even though specified in other Sections shall be the work of this Section.

C. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

D. Preconstruction Compatibility and Adhesion Testing: Submit to joint sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Use manufacturers standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit not fewer than nine pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
5. Testing will not be required if joint sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility

E. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods. Test joints installed in or between fire-resistance rated walls, floor/ceiling assemblies and roof/ceiling assemblies in accordance with ASTM E 1966 or UL 2079.
3. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

F. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to joint substrates as follows:

1. Locate test joints where indicated or, if not indicated, as directed by Architect.
2. Conduct field tests for each application indicated below:

    a. Each type of elastomeric sealant and joint substrate indicated.

3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint sealant manufacturer's technical representative present.
5. Test Method: Test joint sealants by hand-pull method described below:

    a. Install joint sealants in 60-inch-long joints using same materials and methods for joint preparation and joint-sealant installation required for the completed Work. Allow sealants to cure fully before testing.
    b. Make knife cuts from one side of joint to the other, followed by two cuts approximately 2 inches long at sides of joint and meeting cross cut at one end. Place a mark 1 inch from cross-cut end of 2-inch piece.
    c. Use fingers to grasp 2-inch piece of sealant between cross-cut end and 1-inch mark; pull firmly at a 90-degree angle or more in direction of side cuts while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
    d. For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending cut along one side, checking adhesion to opposite side, and then repeating this procedure for opposite side.

6. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
7. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of

noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

G. Mockups: Before installing joint sealants, apply elastomeric sealants as follows to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution:

1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 degrees F.
3. When joint substrates are wet.

B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.8 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Special Installer's Warranty: Written warranty, signed by Installer agreeing to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

C. Special Manufacturer's Warranty: Written warranty, signed by elastomeric sealant manufacturer agreeing to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: 20 years from date of Substantial Completion.

D. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:

1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

## PART 2 - PRODUCTS

### 2.1 MATERIALS, GENERAL

A. Provide joint sealants, joint fillers and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.

### 2.2 ELASTOMERIC JOINT SEALANTS

A. Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class, and Uses. Joints installed in or between fire-resistance rated walls, floor/ceiling assemblies and roof/ceiling assemblies shall be protected by a fire-resistant joint sealant joint system tested in accordance with ASTM E 1966 or UL 2079.

B. Additional Movement Capability: Where at least a 25% in both compression and extension movement capability elastomeric joint-sealant is specified, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719, to withstand the manufacturer's current published percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C 920 for uses indicated.

C. Single-Component Neutral-Curing Silicone Sealant:

1. Products:

    a. Dow Corning Corporation; "DOWSIL 795"
    b. Momentive Performance Materials (GE); “UltraPruf II SCS2900”
    c. Pecora Corporation; “898”

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 50
4. Use Related to Exposure: NT (nontraffic)
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

    a. Use O Joint Substrates: Galvanized steel and other Use O substrates.

6. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.
7. Colors: As selected by Architect from manufacturer's available colors.

## 2.3 LATEX JOINT SEALANTS

A. Latex Sealant: Comply with ASTM C 834, Type P, Grade NF.

B. Products:

1. Pecora Corporation; “AC-20+”
2. BASF - Sonneborn, Division of ChemRex Inc.; “Sonolac”
3. Tremco; “Tremflex 834”

## 2.4 SECURITY SEALANT

A. Two-Part Epoxy Security Sealant: Comply with ASTM C 881, Type I and III, Grade 3, Classes B & C.

B. Product:

1. Pecora Corporation; ; “Dynapoxy EP-1200”

## 2.5 JOINT SEALANT BACKING

A. Provide sealant backings of material and type which are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are accepted for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Provide preformed, compressible, resilient, non-waxing, non-extruding strips of plastic foam of material indicated below, and of size, shape and density to control sealant depth and otherwise contribute to producing optimum sealant performance, complying with ASTM C 1330.

1. Either flexible, open cell polyurethane foam or non-gassing, closed-cell poly-ethylene foam, unless otherwise indicated, subject to approval of sealant

manufacturer.

C. Provide polyethylene bond-breaker tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back (3rd) surface of joint. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

A. Provide primer type recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate and field tests.

B. Provide non-staining, chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials which are not harmful to substrates and adjacent nonporous materials.

C. Provide non-staining, non-absorbent type masking tape compatible with joint sealants and to surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 INSPECTION

A. Require installer to inspect joints indicated to receive joint sealants for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealant performance. Obtain installer's written report listing any conditions detrimental to performance of joint sealant work. Do not allow joint sealant work to proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. At Contractor's direction, installer, joint sealant manufacturers' representatives, and other trades whose work affects installation of joint sealants shall meet at Project Site to review procedures and time schedule proposed for installation of joint sealants which is coordinated with other, related work.

B. Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturers and the following requirements:

1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealant, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; oil; grease; waterproofing; water repellants; water; surface dirt and frost.
2. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, acid washing or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints

with oil-free compressed air.

3. Remove laitance and form release agents from concrete.
4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile and other non-porous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealants.

C. Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond, do not allow spillage or migration onto adjoining surfaces.

D. Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

## 3.3 INSTALLATION OF JOINT SEALANTS

A. Comply with joint sealant manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Comply with the recommendations of ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications and conditions indicated.

D. Install sealant backings to comply with the following requirements:

1. Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the crosssectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability.

    a. Do not leave gaps between ends of joint-fillers.
    b. Do not stretch, twist, puncture or tear joint-fillers.
    c. Remove absorbent joint-fillers which have become wet prior to sealant application and replace with dry material.

2. Install bond breaker tape between sealants and joint-fillers, compression seals or back of joints where required to prevent third-side adhesion of sealant to back of joint.

E. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

F. Immediately after sealant application and prior to time skinning or curing begins, tool

sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

1. Flush joint configuration per Figure 6B in ASTM C 1193, where indicated.
   a. Use masking tape to protect adjacent surfaces of recessed tooled joints.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field-test joint-sealant adhesion to joint substrates as follows:

1. Extent of Testing: Test completed elastomeric sealant joints as follows:
   a. Perform 10 tests for the first 1000 feet of joint length for each type of elastomeric sealant and joint substrate.
   b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.

2. Test Method: Test joint sealants by hand-pull method described below:

   a. Make knife cuts from one side of joint to the other, followed by two cuts approximately 2 inches long at sides of joint and meeting cross cut at one end. Place a mark 1 inch from cross-cut end of 2-inch piece.
   b. Use fingers to grasp 2-inch piece of sealant between cross-cut end and 1-inch mark; pull firmly at a 90-degree angle or more in direction of side cuts while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
   c. For joints with dissimilar substrates, check adhesion to each substrate separately. Do this by extending cut along one side, checking adhesion to opposite side, and then repeating this procedure for opposite side.

3. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field adhesion test log.
4. Inspect tested joints and report on the following:

   a. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field- adhesion hand-pull test criteria.
   b. Whether sealants filled joint cavities and are free from voids.
   c. Whether sealant dimensions and configurations comply with specified requirements.

5. Record test results in a field adhesion test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill,

sealant configuration, and sealant dimensions.

6. Repair sealants pulled from test area by applying new sealants following same procedures used to originally seal joints. Ensure that original sealant surfaces are clean and new sealant contacts original sealant.

B. Evaluation of Field-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements, will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

## 3.5 PROTECTION AND CLEANING

A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and reseal joints with new materials to produce joint sealant installations with repaired areas indistinguishable from original work.

B. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

END OF SECTION

# SECTION 08 13 13 - HOLLOW METAL DOORS AND FRAMES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any,apply to this Section.

### 1.2 SUMMARY

A. Section includes interior hollow metal non-rated and fire-rated doors and frames where indicated.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.5 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures”.

B. Product Data:

1. Manufacturer's standard details and catalog data demonstrating compliance with specifications and referenced standards.
2. Manufacturer's installation instructions.

B. Shop Drawings:

1. Indicate complete schedule in detail for each steel door and frame using the same reference number for details and openings as those on the Contract Drawings. If any door is not by the steel door manufacturer only the door opening number should be shown along with the type of door (wood, plastic laminate faced, etc.).
2. Show details of construction, installation, connections, anchors, hardware reinforcement, hardware preparation, louvers, and floor and threshold clearances.

C. Samples:

1. 12 inch x 12 inch sample of a fire-rated and non-rated door, cut from corner of door, showing door construction.
2. 12 inch x 12 inch sample of each type of door louver specified or required, showing louver construction.
3. 6 inch long sample of a fire-rated, non-rated frame, and each type of glass stop specified or required, showing corner and construction.

D. Certificates:

1. Manufacturer’s certification that oversized openings are in compliance with specifications.

1.6 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to Drawings and other sections of the specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Manufacturer Qualifications: If other than a manufacturer listed under Paragraph 2.1 is proposed for use on the Project, it shall be a company specializing in the manufacturer of steel doors and frames of the type specified for this Project with a minimum of five (5) years experience.

C. All steel doors and frames shall be by a single manufacturer.

1.7 REGULATORY REQUIREMENTS

A. Fire-Rated Assemblies:

1. Fire-Rated Door, Panel, Frame, and Fire Window Construction: Shall conform to ASTM E152, NFPA 252, or UL 10B, as applicable, and acceptable to the code authorities having jurisdiction.
2. Fire-Rated Door Construction:

a. Not withstanding any other requirements of this Specification, provide gauge of metal, method of construction, hardware preparation, reinforcement, and placement, glass opening size, and other specifics required to obtain the specified or required label. The label shall contain the fire resistance rating (20 minute, 30 minute, 1 hour, 1-1/2 hour, 3 hour, etc.) and the designation (A, B, C, D, or E). Doors with “B” Label shall be 1-1/2 hour.
b. Fire-rated doors used in a stairway enclosure, shall be so constructed so that the maximum transmitted temperature shall not exceed 450 degrees F above ambient temperature at the end of 30 minutes of the Standard Fire Exposure Test and shall be so noted on the label.

3. Fire-Rated Openings: Conform to NFPA 80 for fire-rated class shown or required by code authorities having jurisdiction and UL 1784 for smoke and draft control door assemblies.

a. Units shall be identical to assemblies whose fire resistance characteristics have been determined in accordance with requirements specified under Paragraph A, 1, above, and shall be labeled and listed by UL, WHI, or other inspection and testing agency acceptable to the code authorities having jurisdiction.
b. Fire-rated steel doors, panels, frames, and fire windows shall bear permanent labels attesting to fire resistance. At stairway enclosures, provide units listed for 450 degree F maximum temperature rise rating for 30 minutes of exposure.
c. Oversized openings shall be constructed in accordance with all applicable requirements for labeled door construction.

d. Fire rated door assemblies with gaps in excess of 1/8 inch between door and frame will not comply with NFPA 80 and UL 1784 for smoke and draft control door assemblies.
e. Locate label on hinge side of doors and frames so that when door is closed, label is not visible.
f. Caution shall be taken to ensure that labels are not removed, damaged or painted over.
g. Glass panes shall not exceed sizes allowed whether indicated or not on the drawings.

1.8 COORDINATION

A. Coordinate the Work of this Section with work in which hollow metal work is installed.

B. Coordinate hardware installation with opening construction. Finish hardware is specified in Division 08 Section “Door Hardware”.

C. Coordinate doors, frames, and windows with glazing specified in Section 08 80 00.

D. Coordinate doors and frames with painting specified in Section 09 90 00.

1.9 DELIVERY, STORAGE AND HANDLING

A. Deliver and store products in accordance with manufacturer’s instructions, and as follows:

1. In manufacturer's original, clearly labeled, undamaged containers or wrappers.
2. Containers or wrappers shall list the name of the manufacturer and product.

B. Deliver materials to allow for minimum storage time at the project site. Coordinate delivery with the scheduled time of installation.

C. Protect products from moisture, construction traffic, and damage.

1. Store under cover in a clean, dry place, protected from weather and abuse.
2. Store in a manner that will prevent rust or damage.
3. Store doors in a vertical position, spaced with blocking to permit air circulation.
4. Do not use non-vented plastic or canvas shelters.
5. Should containers or wrappers become wet, remove immediately.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ceco Door Products; an ASSA ABLOY Group Company.
2. Steelcraft; an Ingersoll-Rand Company.

2.2 MATERIALS, GENERAL

A. Doors and frames shall be fabricated of either commercial quality, cold-rolled steel conforming to ASTM A366 or hot-rolled, pickled and oiled steel conforming to ASTM A569.

2.3 FRAME FABRICATION

A. Minimum Gauges:

1. Interior Openings: 14 gauge

B. Design and Construction:

1. Frames shall be custom made, welded units with integral trim of sizes and shapes shown on approved shop drawings. Hinge jambs that butt adjacent 90 degree walls shall have at least four (4) inch wide frame face to assure the door trim will not strike the wall prior to the door opening at least 90 degrees. Frame profile shall match wall thickness where practical.
2. Frames shall be strong and rigid, neat in appearance, square, true and free of defects, warp and buckle. Moulded members shall be clean cut, straight and of uniform profile throughout their length.
3. Jamb depths, trim, profile and backbends shall be as shown on approved shop drawings.
4. Corner joints shall have contact edges closed tight, with trim faces mitered and continuously welded, and stops butted. The use of gussets shall not be permitted.
5. Minimum depth of stops shall be 5/8 inch, except at fire windows where minimum depth of stops shall be 3/4 inch.
6. Frames for multiple openings shall have mullion and rail members which are closed tubular shapes having no visible seams or joints. Joints between faces of abutting members shall be securely welded and finished smooth. Mullions shall be key locked removable type. Keys shall be master keyed to Owner's system as specified in Section 08710.
7. Hardware Reinforcements:

a. Frames shall be mortised, reinforced, drilled and tapped at factory for fully templated mortised hardware in accordance with approved hardware schedule and templates provided by Section 08710. Where surface-mounted hardware is to be applied, frames shall have reinforcing plates only.
b. Minimum thickness of hardware reinforcing plates shall be as follows:
1) Hinge and pivot reinforcements (1-1/4 inch x 10 inch minimum size): 7 gauge
2) Strike reinforcements: 12 gauge
3) Flush bolt reinforcements: 12 gauge
4) Closer reinforcements: 12 gauge
5) Reinforcements for surface-mounted hardware, hold-open arms, surface panic devices: 12 gauge

8. Floor Anchors: Minimum 14 gauge, securely welded inside each jamb, with holes for floor anchorage.

9. Jamb Anchors:

   a. Frames for installation in masonry walls shall be provided with adjustable jamb anchors of the T-Strap type. Anchors shall be not less than 16 gauge steel. The number of anchors provided at each jamb shall be as follows:
      1) Frames up to 7 feet-6 inch height - Three (3) anchors
      2) Frames 7 feet-6 inch to 8 feet-0 inch height - Four (4) anchors
      3) Frames over 8 feet-0 inch height - One (1) anchor for each 2 feet or fraction thereof in height.

   b. Frames for installation in wood or metal stud partitions shall be provided with steel anchors of suitable approved design, not less than 16 gauge thickness, securely welded inside each jamb as follows:
      1) Frames up to 7 feet-6 inch height - Four (4) anchors
      2) Frames 7 feet-6 inch to 8 feet-0 inch height - Five (5) anchors
      3) Frames over 8 feet-0 inch height - Four (4) anchors plus one (1) additional for each 2 feet or fraction thereof over 8 feet-0 inches.

   c. Frames to be anchored to previously placed concrete, masonry or structural steel shall be provided with anchors of suitable design as shown on approved shop drawings.

10. Dust Cover Boxes: Shall be of not less than 26 gauge steel and shall be provided at all mortised hardware items. Eight (8) inch CMU walls with face brick shall have dual offset jamb anchors.
11. Steel Spreader: Shall be provided on all frames, temporarily attached to bottoms of both jambs for bracing during shipping and handling.
12. Loose Glazing Stops: Shall be of cold rolled steel, not less than 20 gauge, butted at corner joints and secured to the frame with countersunk cadmium or zinc-plated screws.

C. Frame Color: Field painted under Section 09 90 00 in color selected by Architect.

2.4 DOOR FABRICATION

A. Minimum Gauges:

1. Interior Doors: 16 gauge

B. Design and Construction:

1. Types: Doors shall be custom fabricated, of types and sizes shown on approved shop drawings, and shall be fully welded seamless construction with no visible seams or joints on faces or vertical edges.Thickness: Shall be 1-3/4 inch, unless specifically noted or shown otherwise.
2. Fabrication:

   a. Doors shall be strong, rigid and neat in appearance, free from warpage and buckle.
   b. Corner bends shall be true and straight and of minimum radius for gage of metal used.

c. Provide 22 gauge steel stiffeners spaced maximum six (6) inches o.c. and extending full height of door.
d. Fill interior with noncombustible fiberglass insulation. Use mineral board filler as required for labeled doors.
e. Faces shall be joined at vertical edges of door by a continuous weld extending full height of door. Welds shall be ground, filled and dressed smooth to provide a smooth flush surface.
f. Top and bottom edges of doors shall be closed with a continuous recessed steel channel not less than 16 gauge, extending full width of door and spot weld to both faces.
g. Edge profile shall be provided on both vertical edges of door as follows:
1) Single-Acting Swing Doors: Beveled 1/8 inch in 2 inches.

i. Hardware Reinforcements:
1) Doors shall be mortised, reinforced, drilled and tapped at factory for fully templated hardware, in accordance with the approved hardware schedule and templates provided by Section 08710. Where surface-mounted hardware is to be applied, doors shall have reinforcing plates only.
2) Minimum gauges for hardware reinforcing plates shall be as follows:
a) Hinge & pivot reinforcements: 7 gauge
b) Reinforcements for lock face, flush bolts, concealed holders, concealed or surface-mounted closers: 12 gauge
c) Reinforcements for lock face, flush bolts, concealed holders, concealed or surface-mounted closers: 12 gauge

3. Glass Mouldings and Stops: Loose stops shall be not less than 20 gauge steel, with butt corner joints, secured to frame opening by countersunk screws. Snap-on attachments will not be acceptable.
4. Louvers (If shown): Shall be inverted "V" blade, sightproof type, unless noted otherwise.
5. Edge Clearances:

a. Between Door and Frame at Head and Jambs: 1/8 inch
b. At Door Sills with No Threshold: 5/8 inch to 3/4 inch above finished floor
c. At Door Sills with Threshold: As required to suit threshold
d. Between Meeting Edges of Double Doors: 1/8 inch

C. Finish:

1. Shop paint steel (whether galvanized or ungalvanized) stops and accessories as follows:

a. Clean surfaces free of mill scale, rust, oil, grease, dirt and other foreign matter.
b. Chemically treat surfaces and apply one (1) coat of an approved baked-on rust-inhibitive primer paint to provide a minimum 0.5 mil dry film thickness.

2. Field painted under Section 09900.

D. Labeled Doors and Frames:

1. Labeled doors and frames shall be provided for openings requiring fire protection ratings as scheduled and to comply with NFPA 80 and UL 1784. Such doors and frames shall be constructed as tested and approved by UL, WHI, or other nationally recognized testing agency having a factory inspection service and approved by code authorities having jurisdiction and shall bear the appropriate permanent label.
2. If any door or frame scheduled to be fire-rated cannot qualify for appropriate labeling because of its size, design, hardware or other reason; the Architect shall be so advised before fabrication work on that item is started.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Separate dissimilar metals. Protect against galvanic action.

B. Frames:

1. Anchorage and Connections: Secure to adjacent construction.
2. Install frames in accordance with manufacturer’s instructions and install labeled frames in accordance with NFPA 80 and UL 1784 for smoke and draft control door assemblies
3. Frame Spreader Bars: Leave intact until frames are set perfectly square and plumb and anchors are securely attached.
4. Remove hardware, with the exception of prime-coated items, tag box, and reinstall after finish paint work is completed. Do not remove or paint over labels on labeled frames.

C. Doors:

1. Install hardware in accordance with hardware manufacturer's templates and instructions.
2. Install doors in accordance with manufacturer’s instructions and install labeled doors in accordance with NFPA 80 and UL 1784 for smoke and draft control door assemblies.
3. Adjust operable parts for correct function.
4. Remove hardware, with the exception of prime-coated items, tag, box, and reinstall after finish paint work is completed. Do not remove or paint over labels on labeled doors.

3.2 ADJUST AND CLEAN

A. Adjust doors for proper operation, free from binding or other defects.

B. Clean and restore soiled surfaces and touch up damaged finishes.

C. Remove scraps and debris, and leave site in clean condition.

END OF SECTION

# SECTION 08 14 16 - WOOD DOORS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:

1. Solid-core doors with plastic-laminate faces
2. Factory fitting flush wood doors to frames and factory machining for hardware.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For each type of door indicated. Include details of core and edge construction, louvers, and trim for openings.

C. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.
2. Indicate dimensions and locations of cutouts.
3. Indicate door finish requirements.
4. Indicate fire-protection ratings for fire-rated doors.

D. Samples for Initial Selection: For plastic-laminate door faces.

E. Samples for Verification:

1. Plastic laminate, 6 inches square, for each color, texture, and pattern selected.
2. Corner sections of doors, approximately 8 by 10 inches, with door faces and edges representing actual materials to be used.

    a. Finish samples for each color, texture, and pattern of plastic laminate required.

3. Louver blade and frame sections, 6 inches long, for each material and finish specified.
4. Frames for light openings, 6 inches long, for each material, type, and finish required.

F. Warranty: Sample of special warranty.

1.4 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to Drawings and other sections of the specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Source Limitations: Obtain flush wood doors from single manufacturer.

C. Quality Standard: In addition to requirements specified, comply with AWI's "Architectural Woodwork Quality Standards Illustrated" and WDMA I.S.1-A, "Architectural Wood Flush Doors"

1. Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.

D. Fire-Rated Wood Doors: Doors complying with NFPA 80 and UL 1784 for smoke and draft control assemblies that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252.

1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
2. Temperature-Rise Limit: Where indicated, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F above ambient after 30 minutes of standard fire-test exposure.

E. Preinstallation Conference: Conduct conference at Project site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in plastic bags or cardboard cartons.

C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.

2. Warranty Period for Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Algoma Hardwoods, Inc.
2. Ampco, Inc.
3. Eggers Industries.
4. Graham; an Assa Abloy Group company.
5. Marshfield Door Systems, Inc.
6. Oshkosh Architectural Door Company.
7. VT Industries Inc.

2.2 DOOR CONSTRUCTION, GENERAL

A. WDMA I.S.1-A Performance Grade: Heavy Duty unless otherwise indicated.

B. Structural-Composite-Lumber-Core Doors:

1. Structural Composite Lumber: WDMA I.S.10.

a. Screw Withdrawal, Face: 700 lbf.
b. Screw Withdrawal, Edge: 400 lbf.

C. Fire-Protection-Rated Doors: Provide core specified or mineral core as needed to provide fire-protection rating indicated.

1. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
2. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
3. Pairs: Provide formed-steel edges and astragals with intumescent seals.

a. Finish steel edges and astragals with baked enamel same color as doors.

D. Mineral-Core Doors:

1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as needed to eliminate through-bolting hardware.
3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

## 2.3 PLASTIC-LAMINATE-FACED DOORS

A. Interior Solid-Core Doors:

1. Grade: Premium.
2. Plastic-Laminate Faces: High-pressure decorative laminates complying with NEMA LD 3, Grade HGS.
3. Colors, Patterns, and Finishes: PL1: Wilsonart 7924-07 Biltmore Cherry.
4. Exposed Vertical and Top Edges: Hardwood edges for staining to match faces.
5. Core: Glued wood stave.
6. Construction: Five plies. Stiles and rails are bonded to core, then entire unit abrasive planed before faces and crossbands are applied. Faces are bonded to core using a hot press.

## 2.4 LOUVERS AND LIGHT FRAMES

A. Wood Louvers: Door manufacturer's standard solid-wood louvers unless otherwise indicated.

1. Wood Species: Same species as door faces.

B. Metal Louvers:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Air Louvers Inc.
b. Anemostat; a Mestek company.
c. Hiawatha Incorporated.
d. L & L Louvers, Inc.
e. LL Building Products, Inc.; a division of GAF Materials Corporation.
f. Louvers & Dampers, Inc.; a Mestek company.
g. McGill Architectural Products.

2. Blade Type: Vision-proof, inverted V.

3. Metal and Finish: Hot-dip galvanized steel, 0.040 inch thick, factory primed for paint finish.

C. Louvers for Fire-Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire-protection rating of 1-1/2 hours and less.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Air Louvers Inc.
b. Anemostat; a Mestek company.
c. Hiawatha Incorporated.
d. L & L Louvers, Inc.
e. LL Building Products, Inc.; a division of GAF Materials Corporation.
f. Louvers & Dampers, Inc.; a Mestek company.
g. McGill Architectural Products.

2. Metal and Finish: Hot-dip galvanized steel, 0.040 inch thick, factory primed for paint finish.

D. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads as follows unless otherwise indicated.

1. Wood Species: Same species as door faces.
2. Profile: Manufacturer's standard shape.
3. At wood-core doors with 20-minute fire-protection ratings, provide wood beads and metal glazing clips approved for such use.

E. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of 0.048-inch- thick, cold-rolled steel sheet; factory primed for paint finish; and approved for use in doors of fire-protection rating indicated.

## 2.5 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.

1. Comply with requirements in NFPA 80 for fire-rated doors and UL 1784 for smoke and draft control assemblies.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.

1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
2. Metal Astragals: Factory machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.

C. Transom and Side Panels: Fabricate matching panels with same construction, exposed surfaces, and finish as specified for associated doors. Finish bottom edges of transoms and top edges of rabbeted doors same as door stiles.

1. Fabricate door and transom panels with full-width, solid-lumber, rabbeted, meeting rails. Provide factory-installed spring bolts for concealed attachment into jambs of metal door frames.

D. Openings: Cut and trim openings through doors in factory.

1. Light Openings: Trim openings with moldings of material and profile indicated.
2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Division 08 Section "Glazing".
3. Louvers: Factory install louvers in prepared openings.

2.6 FACTORY FINISHING

A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.

B. Finish doors at factory.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames before hanging doors.

1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Division 08 Section "Door Hardware".

B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.

1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80 and UL 1784 for smoke and draft control assemblies.

C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.

1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated.

    a. Comply with NFPA 80 for fire-rated doors and UL 1784 for smoke and draft control assemblies
    b. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
    c. Bevel fire-rated doors 1/8 inch in 2 inches at lock edge; trim stiles and rails only to extent permitted by labeling agency.

D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

# SECTION 08 31 00 - ACCESS DOORS AND FRAMES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes the following:

1. Wall access doors and frames.
2. Fire-rated wall access doors and frames.
3. Ceiling access doors and frames.
4. Fire-rated ceiling access doors and frames.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For each type of door and frame indicated. Include construction details relative to materials, individual components and profiles, finishes, and fire ratings (if required) for access doors and frames.

C. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items with concealed framing, suspension systems, piping, ductwork, and other construction. Show the following:

1. Method of attaching door frames to surrounding construction.
2. Ceiling-mounted items including access doors and frames, lighting fixtures, diffusers, grilles, speakers, sprinklers, and special trim.

### 1.4 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to Drawings and other sections of the specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Source Limitations: Obtain doors and frames through one source from a single manufacturer.

C. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 that are identical to access door and frame assemblies tested for fire-test-response characteristics per the following test method and that are labeled and listed by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction:

1. NFPA 252 or UL 10B for vertical access doors.
2. ASTM E 119 or UL 263 for horizontal access doors and frames.

D. Size Variations: Obtain Architect's acceptance of manufacturer's standard size units, which may vary slightly from sizes indicated.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. Acudor Products, Inc.
2. Bar-Co, Inc. Div., Alfab, Inc.
3. Cesco Products.
4. J. L. Industries, Inc.
5. Karp Associates, Inc.
6. Larsen's Manufacturing Company.
7. Milcor Limited Partnership.
8. Nystrom, Inc.
9. Southern Steel Co.

### 2.2 MATERIALS

A. Hot-Rolled Steel Sheets: ASTM A 569/A 569M, Commercial Steel (CS), Type B; free of scale, pitting, and surface defects; pickled and oiled; with minimum thickness indicated representing specified nominal thickness according to ASTM A 568/A 568M.

B. Cold-Rolled Steel Sheets: ASTM A 366/A 366M, Commercial Steel (CS), or ASTM A 620/A 620M, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness; with minimum thickness indicated representing specified nominal thickness according to ASTM A 568/A 568M. Electrolytic zinc-coated steel sheet, complying with ASTM A 591/A 591M, Class C coating, may be substituted at fabricator's option.

C. Drywall Beads: Edge trim formed from 0.0299-inch (0.76-mm) zinc-coated steel sheet formed to receive joint compound and in size to suit thickness of gypsum board.

D. Plaster Bead: Casing bead formed from 0.0299-inch (0.76-mm) zinc-coated steel sheet with flange formed out of expanded metal lath and in size to suit thickness of plaster.

### 2.3 PAINT

A. Shop Primers: Provide primers that comply with Division 09 Section "Painting".

B. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664; selected for good resistance to normal atmospheric corrosion, compatibility with finish

paint systems indicated, and capability to provide a sound foundation for field-applied topcoats despite prolonged exposure.

C. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

2.4 ACCESS DOORS AND FRAMES

A. Maximum-Security, Flush Access Doors and Frames: Fabricated from steel sheet and angles.

1. Basis of Design Product: Southern Steel Co.; 590 Hinged Access Door, or Architect approved equal.
2. Door: Minimum 10 gage sheet metal, flush construction.
3. Frame: Minimum 7 gage formed plate.
4. Hinges: Heavy-duty steel welded to door and frame.
5. Lock: Heavy-duty 1010A detention deadbolt lock.
6. Location: Masonry wall surfaces at all secure plumbing chases, unless indicated otherwise on Drawings.

B. Fire Rated, Uninsulated, Flush Access Doors and Frames with Exposed Trim: Fabricated from steel sheet.

1. Basis-of-Design Product: Nystrom Inc.; I/U Flush Fire Rated Access Panel IT, or Architect approved equal.
2. Fire-Resistance Rating: Not less than 1-1/2 hours.
3. Door: Minimum 20 gage thick sheet metal, flush construction.
4. Frame: Minimum 16 gage thick sheet metal with 1-inch- (25-mm-) wide, surface-mounted trim.
5. Hinges: “Z” concealed piano hinge.
6. Automatic Closer: Spring type.
7. Lock: “M” Mortise prep for Best core to match building system. Refer Division 08 Section “Door Hardware”.
8. Locations: Wall and ceiling surfaces of all non-Courtroom areas where indicated on Drawings.

C. Flush Access Doors and Trimless Frames: Fabricated from steel sheet.

1. Basis-of-Design Product: Nystrom Inc.; N/M Flush Non-Rated Access Panel NW, or Architect approved equal.
2. Door: Minimum 14 gage thick sheet metal, set flush with surrounding finish surfaces.
3. Frame: Minimum 22 gage thick sheet metal with drywall bead flange.
4. Hinges: “Z” concealed piano hinge.
5. Latch: “H” Hex head cam latch.
6. Locations: Wall and ceiling surfaces where indicated on Drawings.

D. Flush Access Doors and Frames with Exposed Trim: Fabricated from steel sheet.

1. Basis-of-Design Product: Nystrom Inc.; N/M Flush Non-Rated Access Panel NT, or Architect approved equal.

2. Door: Minimum 14 gage thick sheet metal, set flush with exposed face flange of frame.
3. Frame: Minimum 16 gage thick sheet metal with 1-inch- (25-mm-) wide, surface-mounted trim.
4. Hinges: "Z" concealed piano hinge.
5. Lock: "M" Mortise prep for lock core to match building system. Refer Division 08 Section "Door Hardware".
6. Locations: Wall and ceiling surfaces where indicated on Drawings.

E. Medium-Security, Flush Access Doors and Frames with Exposed Trim: Fabricated from steel sheet.

1. Basis-of-Design Product: Nystrom Inc.; N/M Flush Non-Rated Medium Security Access Panel MT, or Architect approved equal.
2. Door: Minimum 0.105-inch- (2.7-mm-) thick sheet metal, flush construction.
3. Frame: Minimum 0.105-inch- (2.7-mm-) thick sheet metal with 1-inch- (25-mm-) wide, surface-mounted trim.
4. Hinges: Concealed continuous piano.
5. Lock: "M" Mortise prep for lock core to match building system. Refer Division 08 Section "Door Hardware".
6. Locations: Drywall ceiling surfaces where indicated on Drawings.

## 2.5 FABRICATION

A. General: Provide access door assemblies manufactured as integral units ready for installation.

B. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.

C. Steel Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish attachment devices and fasteners of type required to secure access panels to types of supports indicated.

1. Exposed Flanges: Nominal 1 to 1-1/2 inches (25 to 38 mm) wide around perimeter of frame.
2. Provide mounting holes in frames to attach frames to metal or wood framing in plaster and drywall construction and to attach masonry anchors in masonry construction.

D. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.

1. For cylinder lock, furnish two keys per lock and key all locks alike.

E. Extruded Aluminum: After fabrication, apply manufacturer's standard protective coating on aluminum that will come in contact with concrete.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal fabrications after assembly.

2.7 STEEL FINISHES

A. Surface Preparation: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface-preparation specifications and environmental exposure conditions of installed metal fabrications:

1. Interiors (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning".

B. Apply shop primer to uncoated surfaces of metal fabrications. Comply with SSPC-PA 1, "Paint Application Specification No. 1," for shop painting.

PART 3 - EXECUTION

3.1 PREPARATION

A. Advise installers of other work about specific requirements relating to access door and floor door installation, including sizes of openings to receive access door and frame, as well as locations of supports, inserts, and anchoring devices.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing access doors and frames.

B. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.

3.3 ADJUSTING AND CLEANING

A. Adjust doors and hardware after installation for proper operation.

B. Remove and replace doors and frames that are warped, bowed, or otherwise damaged.

3.4 SCHEDULES

A. Wall and ceiling access doors are required:

1. Where specifically scheduled or noted on Drawings.
2. Where service access is required by Code.
3. Where service access is required for serviceable, operable, adjustable or resettable mechanical, plumbing, and electrical items.

B. Sizes: Unless indicated otherwise.

1. Ceilings, Soffits: 24 inches by 24 inches.
   a. Refer to access requirements in plumbing and HVAC sections.

2. Toilet Room Walls: 12 inches by 12 inches at fixture chase wall.

END OF SECTION

# SECTION 08 71 00

# DOOR HARDWARE

## PART 1 - GENERAL

### 1.1 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware
2. Electronic access control system components

B. Section excludes:

1. Windows
2. Cabinets (casework), including locks in cabinets
3. Signage
4. Toilet accessories
5. Overhead doors

C. Related Sections:

1. Division 01 Section "Alternates" for alternates affecting this section.
2. Division 06 Section "Rough Carpentry"
3. Division 06 Section "Finish Carpentry"
4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
5. Division 08 Sections:
   a. "Metal Doors and Frames"
   b. "Flush Wood Doors"
   c. "Stile and Rail Wood Doors"
   d. "Interior Aluminum Doors and Frames"
   e. "Aluminum-Framed Entrances and Storefronts"
   f. "Stainless Steel Doors and Frames"
   g. "Special Function Doors"
   h. "Entrances"
6. Division 09 sections for touchup, finishing or refinishing of existing openings modified by this section.
7. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
8. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

### 1.2 REFERENCES

A. UL LLC

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

## 1.3 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
   a. Comply with procedures for verifying existing door and frame compatibility for new hardware, as specified in PART 3, "EXAMINATION" article, herein.
   b. Review drawings and Sections from related trades to verify compatibility with specified hardware.
   c. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:

1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Door Hardware Schedule:

a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
b. Submit with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
c. Indicate complete designations of each item required for each opening, include:
   1) Door Index: door number, heading number, and Architect's hardware set number.
   2) Quantity, type, style, function, size, and finish of each hardware item.
   3) Name and manufacturer of each item.
   4) Fastenings and other pertinent information.
   5) Location of each hardware set cross-referenced to indications on Drawings.
   6) Explanation of all abbreviations, symbols, and codes contained in schedule.
   7) Mounting locations for hardware.
   8) Door and frame sizes and materials.
   9) Degree of door swing and handing.
   10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.

3. Key Schedule:
   a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
   b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
   c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
   d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
   e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
   f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

C. Informational Submittals:

1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:
   a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
   b. Include warranties for specified door hardware.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
   a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
   b. Catalog pages for each product.

c. Final approved hardware schedule edited to reflect conditions as installed.
d. Final keying schedule
e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
   a. Fire door assemblies, in compliance with NFPA 80.
   b. Required egress door assemblies, in compliance with NFPA 101.

## 1.4 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
   a. For door hardware: DHI certified AHC or DHC.
   b. Can provide installation and technical data to Architect and other related subcontractors.
   c. Can inspect and verify components are in working order upon completion of installation.
   d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.

4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:

1. Fire-Rated Door Openings:
   a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.

b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.

2. Smoke and Draft Control Door Assemblies:
   a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
   b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.

3. Electrified Door Hardware
   a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.

4. Accessibility Requirements:
   a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.

C. Pre-Installation Meetings

1. Keying Conference
   a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
      1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
      2) Preliminary key system schematic diagram.
      3) Requirements for key control system.
      4) Requirements for access control.
      5) Address for delivery of keys.

2. Pre-installation Conference
   a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   b. Inspect and discuss preparatory work performed by other trades.
   c. Inspect and discuss electrical roughing-in for electrified door hardware.
   d. Review sequence of operation for each type of electrified door hardware.
   e. Review required testing, inspecting, and certifying procedures.
   f. Review questions or concerns related to proper installation and adjustment of door hardware.

3. Electrified Hardware Coordination Conference:
   a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

## 1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.

C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.

D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

## 1.6 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

E. Existing Openings: Where existing doors, frames and/or hardware are to remain, field verify existing functions, conditions and preparations and coordinate to suit opening conditions and to provide proper door operation.

## 1.7 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.

1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
    a. Mechanical Warranty
        1) Locks: 10 years

2) Exit Devices: 10 years
3) Closers: 30 years

b. Electrical Warranty
1) Locks: 1 year
2) Exit Devices: 3 years

## 1.8 MAINTENANCE

A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

B. Turn over unused materials to Owner for maintenance purposes.

# PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."

1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.

B. Approval of alternate manufacturers and/or products other than those listed as "Scheduled Manufacturer" in the individual article for the product category are only to be considered by official substitution request in accordance with section 01 25 00.

C. Approval of products is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.

D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

## 2.2 MATERIALS

A. Fabrication

1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer’s recognized installation standards for application intended.
2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.

3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with “Metal Doors and Frames”, “Flush Wood Doors”, “Stile and Rail Wood Doors” to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

## 2.3 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Ives 5BB series

B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.
2. Provide five knuckle, ball bearing hinges.
3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
   a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
   b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
   a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high
5. 2 inches or thicker doors:
   a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high
6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
8. Where new hinges are specified for existing doors or existing frames, provide new hinges of identical size to hinge preparation present in existing door or existing frame.
9. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
   a. Steel Hinges: Steel pins
   b. Non-Ferrous Hinges: Stainless steel pins
   c. Out-Swinging Exterior Doors: Non-removable pins
   d. Out-Swinging Interior Lockable Doors: Non-removable pins
   e. Interior Non-lockable Doors: Non-rising pins
10. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

## 2.4 ELECTRIC POWER TRANSFER

A. Manufacturers:

1. Scheduled Manufacturer and Product:
   a. Von Duprin EPT-10

B. Requirements:

1. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

## 2.5 MORTISE LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage L9000 series. No Substitute.

B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3-hour fire doors.
2. Indicators: Where specified, provide indicator window measuring a minimum 2-inch x 1/2 inch with 180-degree visibility. Provide messages color-coded with full text and/or symbols, as scheduled, for easy visibility.
3. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
4. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
5. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1-inch (25 mm) throw, constructed of stainless steel.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide switches and sensors integrated into the locks and latches.
7. Provide motor based electrified locksets that comply with the following requirements:
   a. Universal input voltage – single chassis accepts 12 or 24VDC to allow for changes in the field without changing lock chassis.
   b. Fail Safe/Fail Secure – changing mode between electrically locked (fail safe) and electrically unlocked (fail secure) is field selectable without opening the lock case.
   c. Low maximum current draw – maximum 0.4 amps to allow for multiple locks on a single power supply.
   d. Low holding current – maximum 0.01 amps to produce minimal heat, eliminate “hot levers” in electrically locked applications, and to provide reliable operation in wood doors that provide minimal ventilation and air flow.
   e. Connections – provide quick-connect Molex system standard.

8. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
    a. Vandlgard: Provide levers with vandal resistant technology for use at heavy traffic or abusive applications.
    b. Lever Design: 06A/Rhodes.

## 2.6 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
    a. Von Duprin 99/33A series. No Substitute.

B. Requirements:

1. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1 and UL listed for Panic Exit or Fire Exit Hardware.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide grooved touchpad type exit devices, fabricated of brass, bronze, stainless steel, or aluminum, plated to standard architectural finishes to match balance of door hardware.
4. Touchpad must extend a minimum of one half of door width. No plastic inserts are allowed in touchpads.
5. Provide exit devices with deadlatching feature for security and for future addition of alarm kits and/or other electrified requirements.
6. Provide exit devices with weather resistant components that can withstand harsh conditions of various climates and corrosive cleaners used in outdoor pool environments.
7. Provide flush end caps for exit devices.
8. Provide exit devices with manufacturer's approved strikes.
9. Provide exit devices cut to door width and height. Install exit devices at height recommended by exit device manufacturer, allowable by governing building codes, and approved by Architect.
10. Mount mechanism case flush on face of doors or provide spacers to fill gaps behind devices. Where glass trim or molding projects off face of door, provide glass bead kits.
11. Provide cylinder or hex-key dogging as specified at non fire-rated openings.
12. Removable Mullions: 2 inches (51 mm) x 3 inches (76 mm) steel tube. Where scheduled as keyed removable mullion, provide type that can be removed by use of a keyed cylinder, which is self-locking when re-installed.
13. Provide factory drilled weep holes for exit devices used in full exterior application, highly corrosive areas, and where noted in hardware sets.
14. Provide electrified options as scheduled.
15. Top latch mounting: double- or single-tab mount for steel doors, face mount for aluminum doors eliminating requirement of tabs, and double tab mount for wood doors.
16. Provide exit devices with optional trim designs to match other lever and pull designs used on the project.

## 2.7 CYLINDERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage Large Format interchangeable core (FSIC) to match existing keying system. No Substitute.

B. Requirements:

1. Provide cylinders/cores compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset; manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Provide cylinders in the below-listed configuration(s), distributed throughout the Project as indicated.
   a. Patented Restricted: cylinder with permanent core with patented, restricted keyway.
   b. Patented Restricted: cylinder with interchangeable core with patented, restricted keyway.

3. Patent Protection: Cylinders/cores requiring use of restricted, patented keys, patent protected.
4. Nickel silver bottom pins.

## 2.8 KEYING

A. Scheduled System:

1. Existing factory registered system:
   a. Provide cylinders/cores keyed into Owner's existing factory registered keying system. Comply with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

B. Requirements:

1. Construction Keying:
   a. Replaceable Construction Cores.
      1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
         a) 3 construction control keys
         b) 12 construction change (day) keys.
      2) Owner or Owner's Representative will replace temporary construction cores with permanent cores.

2. Permanent Keying:
   a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
      1) Master Keying system as directed by the Owner.
   b. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
   c. Provide keys with the following features:
      1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
      2) Patent Protection: Keys and blanks protected by one or more utility patent(s).

3) Geographically Exclusive: Where High Security or Security cylinders/cores are indicated, provide nationwide, geographically exclusive key system complying with the following restrictions.

d. Identification:
   1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
   2) Identification stamping provisions must be approved by the Architect and Owner.
   3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
   4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
   5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.

e. Quantity: Furnish in the following quantities.
   1) Permanent Control Keys: 3.
   2) Master Keys: 6.
   3) Change (Day) Keys: 3 per cylinder/core that is keyed differently
   4) Key Blanks: Quantity as determined in the keying meeting.

## 2.9 KEY CONTROL SYSTEM

A. Requirements:

1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
   a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
   b. Provide hinged-panel type cabinet for wall mounting.

## 2.10 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. LCN 4040XP series. No Substitute.

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with high strength cast iron cylinder, and full complement bearings at shaft.
3. Cylinder Body: 1-1/2-inch (38 mm) diameter piston with 5/8-inch (16 mm) diameter double heat-treated pinion journal. QR code with a direct link to maintenance instructions.

4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards. Provide snap-on cover clip, with plastic covers, that secures cover to spring tube.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck. Provide graphically labelled instructions on the closer body adjacent to each adjustment valve. Provide positive stop on reg valve that prevents reg screw from being backed out.
7. Provide closers with solid forged steel main arms and factory assembled heavy-duty forged forearms for parallel arm closers.
8. Pressure Relief Valve (PRV) Technology: Not permitted.
9. Finish for Closer Cylinders, Arms, Adapter Plates, and Metal Covers: Powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117, or has special rust inhibitor (SRI).
10. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

## 2.11 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

B. Requirements:

1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

## 2.12 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

## 2.13 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers:
   a. Glynn-Johnson

B. Requirements:

1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.

## 2.14 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button of thumbturn.
2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

## 2.15 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Zero International

B. Requirements:

1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

## 2.16 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

## 2.17 COAT HOOKS

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives

B. Provide coat hooks as specified.

## 2.18 FINISHES

A. FINISH: As Scheduled.

# PART 3 - EXECUTION

## 3.1 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

## 3.2 INSTALLATION

A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.

1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
2. Custom Steel Doors and Frames: HMMA 831.
3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
4. Installation Guide for Doors and Hardware: DHI TDH-007-20

B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.

C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.

D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.

I. Lock Cylinders:

1. Install construction cores to secure building and areas during construction period.
2. Replace construction cores with permanent cores as indicated in keying section.
3. Furnish permanent cores to Owner for installation.

J. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

K. Door Closers & Auto Operators: Mount closers/operators on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers/operators so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.

L. Overhead Stops/Holders: Mount overhead stops/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

M. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.

N. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

O. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

P. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

Q. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

R. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

## 3.3 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

## 3.4 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items per manufacturer's instructions to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

## 3.5 DOOR HARDWARE SCHEDULE

A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.

C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.

D. Hardware Sets:

114084 OPT0377475-V1

**HARDWARE SET # 001**

EACH SGL DOOR(S) TO HAVE:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|---|---|---|---|---|---|---|

ALL HARDWARE BY DETENTION DOOR MFR. GC TO COORDINATE PRIOR TO BID.

**HARDWARE SET # 103**

EACH SGL DOOR(S) TO HAVE:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|---|---|---|---|---|---|---|
| 4 | EA | HINGE | 5BB1 4.5 X 4.5 SEC (3 EA. AT DOORS <90") | | 652 | IVE |
| 1 | EA | OFFICE/ENTRY LOCK | L9050T 06A L583-363 TORX | | 626 | SCH |
| 1 | EA | FSIC CORE | 20-030 X MATCH EXISTING KEYING SYSTEM | | 626 | SCH |
| 1 | EA | FLOOR/WALL STOP | FS436/WS406CCV AS REQ | | 626 | IVE |
| 1 | EA | COAT AND HAT HOOK | 572 | | 626 | IVE |
| 3 | EA | SILENCER | SR64 | | GRY | IVE |

**HARDWARE SET # 107**

EACH SGL DOOR(S) TO HAVE:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|---|---|---|---|---|---|---|
| 4 | EA | HINGE | 5BB1 4.5 X 4.5 SEC (3 EA. AT DOORS <90") | | 652 | IVE |
| 1 | EA | OFFICE/ENTRY LOCK | L9050T 06A L583-363 TORX | | 626 | SCH |
| 1 | EA | FSIC CORE | 20-030 X MATCH EXISTING KEYING SYSTEM | | 626 | SCH |
| 1 | EA | OH STOP | 100S SERIES X SIZE & MOUNTING AS REQ | | 630 | GLY |
| 1 | EA | SURFACE CLOSER | 4040XP ST-1630 TORX TBWMS X MTG BRKT/SPCR/PLT AS REQ | | 689 | LCN |
| 1 | EA | KICK PLATE - AS REQ | 8400 10" X 2" LDW B-CS | | 630 | IVE |
| 1 | EA | COAT AND HAT HOOK | 572 | | 626 | IVE |
| 3 | EA | SILENCER | SR64 | | GRY | IVE |

**HARDWARE SET # 203**

EACH SGL DOOR(S) TO HAVE:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|---|---|---|---|---|---|---|
| 4 | EA | HINGE | 5BB1 4.5 X 4.5 SEC (3 EA. AT DOORS <90") | | 652 | IVE |
| 1 | EA | STOREROOM LOCK | L9080T 06A TORX | | 626 | SCH |
| 1 | EA | FSIC CORE | 20-030 X MATCH EXISTING KEYING SYSTEM | | 626 | SCH |
| 1 | EA | FLOOR/WALL STOP | FS436/WS406CCV AS REQ | | 626 | IVE |
| 3 | EA | SILENCER | SR64 | | GRY | IVE |

**HARDWARE SET # 203S**

EACH SGL DOOR(S) TO HAVE:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|---|---|---|---|---|---|---|
| 4 | EA | HINGE | 5BB1 4.5 X 4.5 SEC (3 EA. AT DOORS <90") | | 652 | IVE |
| 1 | EA | STOREROOM LOCK | L9080T 06A TORX | | 626 | SCH |
| 1 | EA | FSIC CORE | 20-030 X MATCH EXISTING KEYING SYSTEM | | 626 | SCH |
| 1 | EA | OH STOP | 900S SERIES X SIZE & MOUNTING AS REQ | | 630 | GLY |
| 3 | EA | SILENCER | SR64 | | GRY | IVE |

**HARDWARE SET # 341**

EACH SGL DOOR(S) TO HAVE:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|---|---|---|---|---|---|---|
| 4 | EA | HINGE | 5BB1 4.5 X 4.5 SEC (3 EA. AT DOORS <90") | | 652 | IVE |
| 1 | EA | PRIVACY LOCK W/ OUTSIDE INDICATOR | L9040 06A L583-363 OS-OCC TORX | | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP REG OR EDA AS REQ W/TORX TBWMS X MTG BRKT/SPCR/PLT AS REQ | | 689 | LCN |
| 1 | EA | FLOOR/WALL STOP | FS436/WS406CCV AS REQ | | 626 | IVE |
| 1 | EA | COAT AND HAT HOOK | 572 | | 626 | IVE |
| 3 | EA | SILENCER | SR64 | | GRY | IVE |

**HARDWARE SET # 343**

EACH SGL DOOR(S) TO HAVE:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|---|---|---|---|---|---|---|
| 4 | EA | HINGE | 5BB1 4.5 X 4.5 SEC (3 EA. AT DOORS <90") | | 652 | IVE |
| 1 | EA | PRIVACY LOCK W/ OUTSIDE INDICATOR | L9040 06A L583-363 OS-OCC TORX | | 626 | SCH |
| 1 | EA | FLOOR/WALL STOP | FS436/WS406CCV AS REQ | | 626 | IVE |
| 1 | EA | COAT AND HAT HOOK | 572 | | 626 | IVE |
| 3 | EA | SILENCER | SR64 | | GRY | IVE |

**HARDWARE SET # 401**

EACH SGL DOOR(S) TO HAVE:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|---|---|---|---|---|---|---|
| 4 | EA | HINGE | 5BB1 4.5 X 4.5 SEC (3 EA. AT DOORS <90") | | 652 | IVE |
| 1 | EA | PASSAGE SET | L9010 06A TORX | | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP REG OR EDA AS REQ W/TORX TBWMS X MTG BRKT/SPCR/PLT AS REQ | | 689 | LCN |
| 1 | EA | KICK PLATE - AS REQ | 8400 10" X 2" LDW B-CS | | 630 | IVE |
| 1 | EA | FLOOR/WALL STOP | FS436/WS406CCV AS REQ | | 626 | IVE |
| 3 | EA | SILENCER | SR64 | | GRY | IVE |

**HARDWARE SET # 503**

EACH SGL DOOR(S) TO HAVE:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|---|---|---|---|---|---|---|
| 4 | EA | HINGE | 5BB1 4.5 X 4.5 SEC (3 EA. AT DOORS <90") | | 652 | IVE |
| 1 | EA | CLASSROOM LOCK | L9070T 06A TORX | | 626 | SCH |
| 1 | EA | FSIC CORE | 20-030 X MATCH EXISTING KEYING SYSTEM | | 626 | SCH |
| 1 | EA | FLOOR/WALL STOP | FS436/WS406CCV AS REQ | | 626 | IVE |
| 3 | EA | SILENCER | SR64 | | GRY | IVE |

**HARDWARE SET # 507**

EACH SGL DOOR(S) TO HAVE:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|---|---|---|---|---|---|---|
| 4 | EA | HINGE | 5BB1 4.5 X 4.5 SEC (3 EA. AT DOORS <90") | | 652 | IVE |
| 1 | EA | CLASSROOM LOCK | L9070T 06A TORX | | 626 | SCH |
| 1 | EA | FSIC CORE | 20-030 X MATCH EXISTING KEYING SYSTEM | | 626 | SCH |
| 1 | EA | OH STOP | 100S SERIES X SIZE & MOUNTING AS REQ | | 630 | GLY |
| 1 | EA | SURFACE CLOSER | 4040XP ST-1630 TORX TBWMS X MTG BRKT/SPCR/PLT AS REQ | | 689 | LCN |
| 3 | EA | SILENCER | SR64 | | GRY | IVE |

**HARDWARE SET # 806**

EACH PR DOOR(S) TO HAVE:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|---|---|---|---|---|---|---|
| 8 | EA | HINGE | 5BB1HW 4.5 X 4.5 SEC (3 EA. AT DOORS <90") | | 652 | IVE |
| 2 | EA | PUSH PLATE | 8200 6" X 16" | | 630 | IVE |
| 2 | EA | PULL PLATE | 8303 10" 6" X 16" | | 630 | IVE |
| 2 | EA | OH STOP | 100S SERIES X SIZE & MOUNTING AS REQ | | 630 | GLY |
| 2 | EA | SURFACE CLOSER | 4040XP ST-1630 TORX TBWMS X MTG BRKT/SPCR/PLT AS REQ | | 689 | LCN |
| 2 | EA | SILENCER | SR64 | | GRY | IVE |

**HARDWARE SET # C201**

EACH SGL DOOR(S) TO HAVE:

| QTY | | DESCRIPTION | CATALOG NUMBER | | FINISH | MFR |
|---|---|---|---|---|---|---|
| 4 | EA | HINGE | 5BB1HW 4.5 X 4.5 NRP SEC (3 EA. AT DOORS <90") | | 652 | IVE |
| 1 | EA | POWER TRANSFER | EPT10 | | 689 | VON |
| 1 | EA | EU MORTISE LOCK | L9092TEU 06A RX TORX | | 626 | SCH |
| 1 | EA | FSIC CORE | 20-030 X MATCH EXISTING KEYING SYSTEM | | 626 | SCH |
| 1 | EA | SURFACE CLOSER | 4040XP REG OR EDA AS REQ W/TORX TBWMS X MTG BRKT/SPCR/PLT AS REQ | | 689 | LCN |
| 1 | EA | KICK PLATE - AS REQ | 8400 10" X 2" LDW B-CS | | 630 | IVE |
| 1 | EA | FLOOR/WALL STOP | FS436/WS406CCV AS REQ | | 626 | IVE |
| 1 | EA | GASKETING | 488S PSA H & J (USE SILENCERS AT NON-RATED DOORS) | | BK | ZER |
| 1 | EA | CREDENTIAL READER | BY SECURITY CONTRACTOR | | | |
| 1 | EA | DOOR CONTACT | BY SECURITY CONTRACTOR | | | |
| 1 | EA | POWER SUPPLY | BY SECURITY CONTRACTOR | | | |

- INGRESS VIA CARD READER OR MANUAL KEY OVERRIDE. FREE EGRESS AT ALL TIMES. FAIL-SECURE.

END OF SECTION

# SECTION 08 80 00 - GLAZING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Hollow metal doors and frames.
2. Wood doors.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction. Fire protection rated glazing shall be tested in accordance with and meet acceptance criteria of NFPA 257.

### 1.4 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For each glass product and glazing material indicated.

C. Samples: For the following products, in the form of 12-inch square Samples for glass and of 12-inch long Samples for sealants. Install sealant Samples between two strips of material representative in color of the adjoining framing system.

D. Samples: For the following products, in the form of 12-inch square Samples.

1. For each color (except black) of exposed glazing sealant indicated.

E. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.

F. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.

G. Qualification Data: For installers.

H. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.

I. Product Test Reports: For each of the following types of glazing products:

1. Glazing and glazing sealants.
2. Glazing gaskets.

J. Warranties: As specified in this Section.

1.5 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to Drawings and other sections of the specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.

C. Source Limitations for Glass: Obtain the following through one source from a single manufacturer for each glass type: clear float glass.

D. Source Limitations for Glazing Accessories: Obtain glazing accessories through one source from a single manufacturer for each product and installation method indicated.

E. Elastomeric Glazing Sealant Product Testing: Obtain sealant test results for product test reports in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.

1. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
2. Test elastomeric glazing sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.

F. Preconstruction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing indicated below, samples of each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants:

1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.

2. Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
5. Testing will not be required if elastomeric glazing sealant manufacturers submit data based on previous testing of current sealant products for adhesion to, and compatibility with, glazing materials matching those submitted.

G. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201.

1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.
2. Where glazing units, including Kind FT glass are specified in Part 2 articles for glazing lites more than 9 sq. ft. in exposed surface area of one side, provide glazing products that comply with Category II materials, for lites 9 sq. ft. or less in exposed surface area of one side, provide glazing products that comply with Category I or II materials, except for hazardous locations where Category II materials are required by 16 CFR 1201 and regulations of authorities having jurisdiction.

H. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: GANA's "Glazing Manual".

I. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockups in the location and of the size indicated or, if not indicated, as directed by Architect.
2. Build glass mockups by installing the following kinds of glass in mockups specified in Division 08 Section "Aluminum-Framed Entrances and Storefronts" to match glazing systems required for Project, including glazing methods:

   a. Fully tempered glass.

3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

J. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1.8 WARRANTY

A. Manufacturer's Warranty: Manufacturer's warranty against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials and workmanship.

B. Defects include, but are not limited to:

1. Faulty, improper or inadequate attachment or installation.
2. Chipped edges, broken or scratched mirrors.
3. Distortion or waves
4. Watertightness of glazed systems, including aluminum framing systems, store-front, and window systems applicable to Project.

a. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS

A. Annealed Float Glass: ASTM C 1036, Type I (transparent flat glass), Quality-Q3; of class indicated.

B. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent flat glass); Quality-Q3; of class, kind, and condition indicated.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.
2. Provide Kind HS (heat-strengthened) float glass in place of annealed float glass where needed to resist thermal stresses induced by differential shading of individual glass lites and to comply with glass design requirements specified in Part 1 "Performance Requirements" Article.
3. For uncoated glass, comply with requirements for Condition A.
4. Provide Kind FT (fully tempered) float glass in place of annealed or Kind HS (heat-strengthened) float glass where safety glass is indicated.

2.2 GLAZING GASKETS

A. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:

1. EPDM, ASTM C 864.

B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned gaskets of material indicated below; complying with ASTM C 509, Type II, black; and of profile and hardness required to maintain watertight seal:

1. EPDM.

C. Lock-Strip Gaskets: Neoprene extrusions in size and shape indicated, fabricated into frames with molded corner units and zipper lock-strips, complying with ASTM C 542, black.

2.3 GLAZING SEALANTS

A. General: Provide products of type indicated, complying with the following requirements:

1. Compatibility: Select glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Elastomeric Glazing Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

1. Neutral-Curing Silicone Glazing Sealants:

a. Available Products:
1) Dow Corning Corporation; DOWSIL 791.
2) Dow Corning Corporation; DOWSIL 795.
3) GE Silicones; SilPruf NB SCS9000.
4) GE Silicones; UltraPruf II SCS2900.
5) Pecora Corporation; 865.
6) Pecora Corporation; 895.
7) Pecora Corporation; 898.

b. Type and Grade: S (single component) and NS (nonsag).
c. Class: 50.

d. Use Related to Exposure: NT (nontraffic).
e. Uses Related to Glazing Substrates: M, G, A, and, as applicable to glazing substrates indicated, O.

2.4 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions with a Shore, Type A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

2.5 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

2.6 GLAZING UNITS

A. Uncoated Clear Float-Glass Units: 1/4 inch thick clear annealed, Kind HS (heat strengthened), and Kind FT (fully tempered) as indicated on Drawings, or required to comply with building code.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing glazing, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep system.
3. Minimum required face or edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass lites where length plus width is larger than 50 inches as follows:

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 GASKET GLAZING (DRY)

A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Install gaskets so they protrude past face of glazing stops.

3.5 LOCK-STRIP GASKET GLAZING

A. Comply with ASTM C 716 and gasket manufacturer's written instructions. Provide supplementary wet seal and weep system, unless otherwise indicated.

3.6 CLEANING AND PROTECTION

A. Protect exterior glass and window tint film from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.

E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION

# SECTION 09 29 00 - GYPSUM BOARD

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:

1. Metal wall and ceiling framing for gypsum board construction.
2. Gypsumboard.
3. Moisture Resistant Gypsum Board.
4. Taped, filled and sanded joint treatment.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For each type of product indicated.

### 1.4 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to Drawings and other sections of the specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

C. Mockups: Before beginning gypsum board installation, install mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Install mockups for the following:

   a. Each level of gypsum board finish indicated for use in exposed locations.

2. Apply or install final decoration indicated, including painting, on exposed surfaces for review of mockups.
3. Simulate finished lighting conditions for review of mockups.
4. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 STORAGE AND HANDLING

A. Store materials inside under cover and keep them dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack panels flat to prevent sagging.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

B. Do not install interior products until installation areas are enclosed and conditioned.

C. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturers listed whose products meet or exceed the specifications are approved for use on the Project. Where products are named in the specifications, they are considered basis of specification. Other manufacturers must have a minimum of five (5) years experience manufacturing products meeting or exceeding the specifications and comply with Division 1 requirements regarding substitutions to be considered.

1. Gypsum Wallboard and related products and materials:

a. CertainTeed Corporation
b. G-P Gypsum Corporation
c. National Gypsum Company (Gold Bond)
d. United States Gypsum Company (USG)

2. Non-Load Bearing Metal Framing:

a. ClarkDietrich Building Systems
b. Marino\Ware-Div.Ware Industries
c. National Gypsum Company (Gold Bond)
d. Southeastern Stud & Components, Incorporated
e. United States Gypsum Company (USG)

3. Aluminum Moldings:

a. Fry Reglet Corporation
b. MM Systems Corporation

4. Deflection Track and related products and materials:

    a. Fire Trak Corp.
    b. The STEEL Network, Inc.

## 2.2 METAL FRAMING SYSTEM

A. Metal Studs:

1. Channel type screw studs roll formed from 25 gauge galvanized steel, unless shown otherwise on drawings. At walls to receive ceramic tile, provide channel type screw studs roll formed from 20 gauge galvanized steel.
2. Widths shall be as indicated on drawings.

B. Tracks:

1. Channel type screw tracks roll formed from 25 gauge galvanized steel with 1-1/4 inch deep flanges, unless shown otherwise on Drawings.
2. Widths shall be as indicated on Drawings.
3. Deflection Track (DT) (Non-rated walls): Use deflection track at walls extending to structure to allow for movement. Deflection track shall allow 1/2 inch movement. Do not fasten studs directly to Deflection Track.
4. Deflection Track and Firestop System (At fire rated walls at Contractor's Material Option): In lieu of conventional materials that will perform the same, Contractor may use a deflection track and firestop system at heads of fire rated partitions. System shall use "Shadowline" deflection track, mineral fiber, sealant, clips, and accessories required to achieve fire ratings shown or required by authorities having jurisdiction. System shall comply with Deflection Track and Firestop System manufactured by Fire Trak Corp., Kimball, MN; (800) 394-9875, or equal or comparable products manufactured by The STEEL Network, Inc., Raleigh, NC; (919) 845-1025, or Architect approved equal.

C. Drywall Suspension System (As shown or required): Pre-engineered drywall suspension system specially created to simplify the design and construction of flat drywall ceilings. Approved Product/Manufacturer: USG Drywall Suspension System manufactured by USG Interiors, Inc., or Architect approved equal.

D. Wall and Ceiling Materials:

1. Gypsum Wallboard: Shall be 5/8 inch thick, tapered-edge, conforming to ASTM C36, Fire Rated Type X. Size shall be 4 feet-0 inches wide by longest practical length to minimize joints.
2. Moisture Resistant Gypsum Board: Shall be 1/2 inch thick, unless indicated otherwise, ends square cut, tapered edges, conforming to ASTM C630. Size shall be 4 feet-0 inches wide by longest practical length to minimize joints. Use as sheathing at wet wall areas scheduled to receive ceramic tile.
3. Channels: 16 gauge cold rolled steel channels with hot dip galvanized finish. Sizes as indicated on drawings. Use for suspended ceilings and elsewhere as indicated.
4. Furring Channels: Standard 2-3/4 inches wide, 7/8 inch deep galvanized sheet metal furring channel.

5. Corner Beads: No. 28 gauge galvanized steel, 1-1/4 inch legs. Use at all exterior corners.
6. Joint Compound: Taping: Standard types manufactured by gypsum wallboard manufacturer for intended use. Fire rated type must be used on fireproof systems.
7. Laminating Adhesives: Standard type manufactured or recommended by manufacturer of product to be laminated.
8. Acoustic Sealant: Single component, non-skinning, non-hardening synthetic rubber for use in the acoustical sealing of gypsum board partitions. Approved Products and Manufacturers: Tremco Acoustical Sealant manufactured by Tremco Sealant/Weatherproofing Division, Beachwood, OH; (800) 321-7906, or Architect approved equal.
9. Ceiling Hanger and Tie Wire: 9-gauge galvanized hanger wire and 16 gauge tie wire.
10. Screws: One (1) inch and 1-5/8 inch long self drilling, self tapping cadmium plated bugle head type. Comply with applicable reference standards.
11. Resilient Clips: Standard type for resilient installation in accordance with wallboard manufacturer's recommendations.
12. Control Joints: Metal (USG #093) type with 1/4 inch open joint, perforated flanges for floating in place. Control joints shall be located above all interior doors and window jambs every 30 feet-0 inches and along building expansion joints, unless noted otherwise on drawings.
13. Wall Fixture Reinforcement: 6 inches, 14 gauge cold rolled steel galvanized channels.

E. Gypsum Liner Panels: As specified in Division 09 Section "Gypsum Board Shaft-Wall Assemblies".

## 2.3 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized steel sheet.
2. Shapes:

   a. Cornerbead.
   b. LC-Bead: J-shaped; exposed long flange receives joint compound.
   c. L-Bead: L-shaped; exposed long flange receives joint compound.

## 2.4 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475.

B. Joint Tape for Interior Gypsum Wallboard: Paper.

C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.

2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use compound.
5. Skim Coat: For final coat of Level 5 finish, where indicated on drawings, use setting-type, sandable topping compound.

2.5 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.

B. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.

C. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames and framing, for compliance with requirements and other conditions affecting performance.

B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INTERIOR METAL FRAMING INSTALLATION

A. Floor Track: Attach to floor at 24 inches maximum centers with shoot-in pins or concrete nails.

B. Ceiling Track: Fasten at 24 inch intervals, staggered. Where shown or required to extend above ceiling, brace to the structure at intervals not exceeding 4 feet-0 inches.

C. J-Runners: Where shown or required in shaft wall construction in accordance with manufacturer’s instructions.

D. Deflection Track (DT): Deflection track shall allow 1/2 inch movement. Do not fasten studs directly to Deflection Track. At fire rated walls, Contractor’s shall use the specified deflection track with firestop systems.

E. Drywall Suspension System: Use at gypsum drywall suspended ceilings, where shown or required.

F. Metal Studs:

1. Single lengths positioned vertically straight and plumb in the runners, spaced 16 inches o.c., unless shown otherwise on drawings.
2. Anchor all studs located adjacent to door and window frames, partitions intersections and corners to runner flanges by positive screw engagement through each stud flange and runner flange.
3. Position all studs vertically with the open side facing in the same direction, engaging the floor and ceiling runners.
4. Use positive screw attachments with 3/8 inch or 1/2 inch Type “S” or “S-12” pan head screws through each stud flange and runner flange.

G. Wall Fixture Reinforcement: Provide solid bridging spanning between studs at all wall mounted fixtures, finish hardware, toilet partitions, accessories and equipment.

3.3 APPLYING AND FINISHING PANELS, GENERAL

A. Comply with ASTM C 840.

B. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.

C. Locate edge and end joints over supports. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.

D. Form control joints with space between edges of adjoining gypsum panels.

E. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- wide joints to install sealant.

F. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed.

G. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

## 3.4 WALLBOARD INSTALLATION

A. Apply all ceiling boards first as described below. Cut boards so that they slip easily into place. Butt all joints loosely. Never force panels into position. Place tapered or wrapped edges next to one another.

B. Select the maximum practical length to minimize end joints. All end joints shall be neatly fitted and staggered. Joints on opposite sides of partition shall be so arranged as to occur on different studs.

C. Never place a butt end or a cut edge next to a tapered or rounded edge. Wherever possible, apply boards perpendicular to framing and in lengths that will span ceilings and walls without creating end (butt) joints. If butt joints do occur, stagger and locate them as far from the center of walls and ceilings as possible.

D. Support all ends and edges of gypsum board on framing, except long edges at right angles to framing and where end joints are to be floated between frame members and back-blocked.

E. When fastening, apply hand pressure on panel next to fastener being driven to insure panel is in tight contact with framing member.

F. Install metal corner bead at external corners. Where length of the corner does not exceed standard stock lengths, use a single length.

G. Install gypsum board 1/2 inch above surface of slab to prevent wicking of moisture.

H. Install metal trim where indicated.

I. To insure level surfaces at joints, arrange board application so that the leading edge of each board is attached to the open or unsupported edge of a steel stud flange. To do this, all studs must be placed so that their flanges point in the same direction. Board application is then planned to advance in the direction opposite to flange direction.

J. The leading edge of gypsum board shall not be attached to the web edge of a flange.

K. Fasten wallboard at 12 inches o.c. except at the edges/joints which shall be at 8 inches o.c.

L. Edge-Grip Clips: Position clips on the back of the panels and drive prongs into panel edges. Space clips 16 inches o.c. Screw-attach clip to framing, furring or wall surface.

M. Finishing:

1. Apply at least two (2) coats of joint compound over beads, screw heads and trim, and each coat shall be feathered out onto panel faces.
2. Float out and sand joints to make joints invisible when painted with non-texture paint.

N. Caulk around pipes, ducts, structure or similar items which penetrate drywall systems.

O. Provide acoustical sealant at walls in accordance with manufacturer's instructions.

3.5 CEILING FRAMING INSTALLATION

A. Main Runners: 9-gauge hanger wires shall be spaced not over 4 feet-0 inches in the direction of 1-1/2 inch main runner channels and not over 4 feet-0 inches in the direction of right angles to the main runners, and within 6 inches of the ends of main runners and of boundary walls, girders or similar interruptions of ceiling continuity. Do not hang wire supports from metal deck unless directed to do so by Architect or Structural Engineer. Main runners shall be spaced not over 4 feet-0 inches on center.

B. Cross tees shall be spaced in accordance with manufacturer's recommendations or in conformance with UL Fire Resistance Directory.

C. Furring Channels: Space 16 inches o.c., and saddle-tie with two strands of 16-gauge tie wire to main runners or main support members. Do not let into or come in contact with abutting masonry walls. End splices shall be provided by nesting channels or studs no less than 8 inches and securely wire-tie.

D. Drywall Suspension System: Install where indicated in accordance with manufacturer's instructions.

3.6 CEILING BOARD INSTALLATION

A. Apply gypsum board of maximum practical length with the long dimension at right angles to the furring channel and fastened with one (1) inch drywall screws spaced 12 inches o.c. in the field of the board and along abutting ends.

B. Align abutting end or edge joints over the web surface of the furring channel. Tie neatly and accurately with end joints staggered.

C. Install gypsum board ceiling panels on drywall suspension system in accordance with manufacturer's instructions.

3.7 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints at locations indicated on Drawings or, if not indicated, according to ASTM C 840 and in specific locations approved by Architect for visual effect.

C. Interior Trim: Install in the following locations:

1. Cornerbead: Use at outside corners, unless otherwise indicated.
2. LC-Bead: Use at exposed panel edges.
3. L-Bead: Use where indicated.

## 3.8 FINISHING GYPSUM BOARD

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints, rounded or beveled edges, and damaged surface areas.

C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:

1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
2. Level 4: At panel surfaces that will be exposed to view, unless otherwise indicated.

    a. Primer and its application to surfaces are specified in Division 09 Section “Painting and Staining”.

3. Level 5: Where indicated on Drawings.

    a. Primer and its application to surfaces are specified in other Division 09 Section “Painting and Staining”.

## 3.9 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

# SECTION 09 30 00 - TILING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:

1. Ceramic wall tile.
2. Ceramic floor tile.
3. Ceramic tile base.
4. Waterproof membrane for thin-set tile installations.
5. Crack-suppression membrane for thin-set tile installations.
6. Metal edge strips installed as part of tile installations.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 DEFINITIONS

A. Module Size: Actual tile size (minor facial dimension as measured per ASTM C 499) plus joint width indicated.

B. Facial Dimension: Nominal tile size as defined in ANSI A137.1.

### 1.4 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For each type of product indicated.

C. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.

D. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.

E. Product Certificates: For each type of product, signed by product manufacturer.

F. Qualification Data: For Installer.

G. Material Test Reports: For each tile-setting and -grouting product.

1.5 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to the Drawings and other sections of the specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Source Limitations for Tile: Obtain all tile of same type and color or finish from one source or producer.

1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.

C. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.

D. Source Limitations for Other Products: Obtain each of the following products specified in this Section through one source from a single manufacturer for each product:

1. Waterproof membrane.
2. Crack-suppression membrane.
3. Joint sealants.
4. Metal edge strips.

E. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Store liquid latexes in unopened containers and protected from freezing.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

2.2 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile" for types, compositions, and other characteristics indicated.

1. Provide tile complying with Standard grade requirements, unless otherwise indicated.
2. For facial dimensions of tile, comply with requirements relating to tile sizes specified in Part 1 "Definitions" Article.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting and Grouting Materials" Article.

C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:

1. Provide materials and products that result in colors and textures of exposed tile surfaces complying with those indicated in Finish Schedule on Drawings.

D. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

2.3 TILE PRODUCTS

A. Ceramic Floor Tile:

1. F23:

a. Description: Ceramic Tile
b. Location: Lunch Room / Vending
c. Manufacturer: Daltile
d. Style: Volume 1.0
e. Color: Silver VL71
f. Size: 6 inches x 6 inches

2. F24:

    a. Description: Ceramic Tile
    b. Location: Lunch Room / Vending
    c. Manufacturer: Daltile
    d. Style: Volume 1.0
    e. Color: Sonic White VL75
    f. Size: 6 inches x 6 inches

3. F25:

    a. Description: Ceramic Tile
    b. Location: Restrooms
    c. Manufacturer: Daltile
    d. Style: Haut Monde
    e. Color: Aristocrat Cream HM07
    f. Size: 12 inches x 24 inches
    g. Remarks: Grout Color - Mapei Sahara Beige 11

B. Ceramic Wall Tile:

1. W16:

    a. Description: Ceramic Tile
    b. Location: Restrooms
    c. Manufacturer: Daltile
    d. Style: Haut Monde
    e. Color: Aristocrat Cream HM07
    f. Size: 12 inches x 24 inches
    g. Remarks: See Elevations for pattern, Grout Color - Mapei Sahara Beige 11

2. W20:

    a. Description: Ceramic Tile
    b. Location: Court Rooms
    c. Manufacturer: Daltile
    d. Style: Florentine
    e. Color: Nociolla FL09
    f. Size: 12 inches x 24 inches
    g. Remarks: Polished, wall behind Judge’s Bench, RE: Elevations, Grout Color - Laticrete #17 Marble Beige

C. Ceramic Tile Base:

1. B4:

    a. Description: Ceramic Tile
    b. Location: Restroom
    c. Manufacturer: Daltile
    d. Style: Haut Monde

e. Color: Aristocrat Cream HM07
f. Size: 6 inch x 12 inch coved
g. Remarks: Grout Color - Mapei Sahara Beige 11

2. B6:

a. Description: Ceramic Tile
b. Location: Lunch Room / Vending
c. Manufacturer: Daltile
d. Style: Haut Monde
e. Color: Aristocrat Cream HM07
f. Size: 12 inches x 24 inches
g. Style: Volume 1.0
h. Color: Sonic White VL75

## 2.4 WATERPROOFING AND CRACK-SUPPRESSION MEMBRANES FOR THIN-SET TILE INSTALLATIONS

A. General: Manufacturer's standard product that complies with ANSI A118.10.

B. Fabric-Reinforced, Fluid-Applied Product: System consisting of liquid-latex rubber and fabric reinforcement.

1. Available Products:
   a. Custom Building Products; Trowel & Seal Waterproofing and Anti-Fracture Membrane.
   b. LATICRETE International Inc.; Laticrete 9235 Waterproof Membrane.
   c. MAPEI Corporation; PRP M19.
   d. Summitville Tiles, Inc.; S-9000.

## 2.5 SETTING AND GROUTING MATERIALS

A. Available Manufacturers:

1. Daltile Corp.
2. LATICRETE International Inc.
3. MAPEI Corporation.

B. Dry-Set Portland Cement Mortar (Thin Set): ANSI A118.1.

1. For wall applications, provide nonsagging mortar that complies with Paragraph C-4.6.1 in addition to the other requirements in ANSI A118.1.

C. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4, consisting of the following:

1. Prepackaged dry-mortar mix containing dry, redispersible, ethylene vinyl acetate additive to which only water must be added at Project site.
2. Prepackaged dry-mortar mix combined with acrylic resin or styrene-butadiene-rubber liquid-latex additive.

a. For wall applications, provide nonsagging mortar that complies with Paragraph F-4.6.1 in addition to the other requirements in ANSI A118.4.

D. Chemical-Resistant, Water-Cleanable, Tile-Setting and -Grouting Epoxy: ANSI A118.3.

1. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 deg F and 212 deg F, respectively, and certified by manufacturer for intended use.

a. Install at all tile.
1) Color: As specified herein or scheduled in Finish Schedule on Drawings.

## 2.6 ELASTOMERIC SEALANTS

A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Division 07 Section "Joint Sealants".

B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.

C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.

1. Available Products:

a. Dow Corning Corporation; DOWSIL 786.
b. Momentive Performance Materials (GE); Sanitary 1700.
c. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
d. Tremco, Inc.; Tremsil 600 White.

## 2.7 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications, half-hard brass exposed-edge material.

C. Temporary Protective Coating: Either product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.

1. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F per ASTM D 87.
2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.

D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

E. Grout Sealer: Manufacturer's standard product for sealing grout joints that does not change color or appearance of grout.

2.8 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.

1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 Series of tile installation standards for installations indicated.
2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.

B. Provide concrete substrates for tile floors installed with thin-set mortar that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.

1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
2. Remove protrusions, bumps, and ridges by sanding or grinding.

C. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

3.3 INSTALLATION, GENERAL

A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.

B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation". Comply with TCA installation methods indicated in ceramic tile installation schedules.

C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.

F. Lay out tile wainscots to next full tile beyond dimensions indicated.

G. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Locate joints in tile surfaces directly above joints in concrete substrates.
2. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants".

H. Grout tile to comply with requirements of the following tile installation standards:

1. For chemical-resistant epoxy grouts, comply with ANSI A108.6.

I. At wet walls, and where indicated, install cementitious backer units and treat joints to comply with ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.4 WATERPROOFING AND CRACK-SUPPRESSION MEMBRANE INSTALLATION

A. Install waterproofing to comply with ANSI A108.13 and waterproofing manufacturer's written instructions to produce waterproof membrane of uniform thickness bonded securely to substrate.

B. Install crack-suppression membrane to comply with manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.

C. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.5 FLOOR TILE INSTALLATION

A. General: Install tile to comply with requirements in the Floor Tile Installation Schedule, including those referencing TCA installation methods and ANSI A108 Series of tile installation standards. Tile flooring shall be slip resistant and securely attached.

1. For installations indicated below, follow procedures in ANSI A108 Series tile installation standards for providing 95 percent mortar coverage.

a. Tile floors in wet areas.
b. Tile floors composed of tiles 8 by 8 inches or larger.
c. Tile floors composed of rib-backed tiles.

B. Joint Widths: Install tile on floors with the following joint widths:

1. Ceramic Tile: 1/32 inch to 1/16 inch, unless indicated otherwise.

C. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile.

D. Grout Sealer: Apply grout sealer to cementitious grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.

3.6 WALL TILE INSTALLATION

A. Install types of tile designated for wall installations to comply with requirements in the Wall Tile Installation Schedule, including those referencing TCA installation methods and ANSI setting-bed standards.

B. Install scratch coat for walls to comply with ANSI A108.1A, Section 4.1.

C. Joint Widths: Install tile on walls with the following joint widths:

1. Ceramic Tile: 1/32 inch to 1/16 inch, unless indicated otherwise.

## 3.7 CLEANING AND PROTECTING

A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove epoxy grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.

B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.

C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION

# SECTION 09 51 23 - ACOUSTICAL LAY-IN CEILING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes acoustical panels and exposed suspension systems for ceilings indicated on Drawings.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.4 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For each type of product indicated. Indicate flame spread and smoke-developed indexes for acoustic ceiling panels when tested in accordance with ASTM E 84.

C. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Ceiling suspension system members.
2. Method of attaching hangers to building structure.
3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
4. Minimum Drawing Scale: 1/4 inch = 1 foot.

D. Samples for Initial Selection: For components with factory-applied color finishes.

1. Exposed Suspension System Members, Moldings, and Trim: Set of 12-inch-long Samples of each type, finish, and color.

a. Manufacturer’s specifications and other data needed to prove compliance with specified requirements.
b. Manufacturer’s installation instructions.

E. Samples:

1. 12 inch x 12 inch sample of each ceiling panel.
2. 12 inch long sample of each type grid and actual accessories.

F. Research/Evaluation Reports: For each acoustical panel ceiling and components and anchor and fastener type.

G. Maintenance Data: For finishes to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to the Drawings, and other Specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Source Limitations:

1. Acoustical Ceiling Panel: Obtain each type through one source from a single manufacturer.
2. Suspension System: Obtain each type through one source from a single manufacturer.

C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.8 COORDINATION

A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 ACOUSTICAL CEILING TILE

A. Acoustical Ceiling Tile (C1):

1. Description: Acoustical Ceiling Tile
2. Location: General
3. Manufacturer: USG
4. Style: Eclipse Clima Plus 76575
5. Color: White
6. Size: 2 feet x 2 feet
7. Remarks: Medium Texture in metal suspension system below

2.2 METAL SUSPENSION SYSTEM FOR ACOUSTICAL TILE CEILING

A. Ceiling Suspension System (Grid): USG 15/16 inch suspension system by manufacturer.

2.3 METAL EDGE MOLDINGS AND TRIM

A. Roll-Formed, Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that comply with design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.

1. Provide manufacturer's standard edge moldings that fit acoustical panel edge details and suspension systems indicated and that match width and configuration of exposed runners, unless otherwise indicated.
2. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
3. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

B. Extruded-Aluminum Edge Moldings and Trim: Where indicated, provide manufacturer's extruded-aluminum edge moldings and trim of profile indicated or referenced by manufacturer's designations, including splice plates, corner pieces, and attachment and other clips, complying with seismic design requirements and the following:

1. Aluminum Alloy: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of aluminum extrusions complying with ASTM B 221 for Alloy and Temper 6063-T5.
2. Finish designations prefixed by AA comply with system established by the Aluminum Association for designating aluminum finishes.
3. Baked-Enamel Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; organic coating: as specified below). Apply baked enamel complying with paint manufacturer's written instructions for cleaning, conversion coating, and painting.

a. Organic Coating: Thermosetting, primer/topcoat system with a minimum dry film thickness of 0.8 to 1.2 mils.
(1) Color: White.

2.4 ACOUSTICAL SEALANT

A. Products: Subject to compliance with requirements, provide one of the following:

1. Acoustical Sealant for Exposed and Concealed Joints:

a. Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
b. USG Corporation; SHEETROCK Acoustical Sealant.

2. Acoustical Sealant for Concealed Joints:

a. OSI Sealants, Inc.; Pro-Series SC-175 Rubber Base Sound Sealant.
b. Pecora Corporation; BA-98.
c. Tremco, Inc.; Tremco Acoustical Sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

A. General: Install acoustical panel ceilings to comply with ASTM C 636, ASTM C 635, per manufacturer's written instructions, and CISCA's "Ceiling Systems Handbook".

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
6. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
7. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
8. Do not attach hangers to steel deck tabs.
9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
11. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.

C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.

D. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

E. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

1. Arrange directionally patterned acoustical panels with pattern running in one direction parallel to long axis of space, unless indicated otherwise.
2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
3. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.

4. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.
5. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, space as recommended by panel manufacturer's written instructions, unless otherwise indicated.

## 3.4 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

# SECTION 09 65 19 - RESILIENT TILE FLOORING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes resilient tile flooring where indicated.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: Submit manufacturer's product data, installation guide and maintenance guide for each material and accessory proposed for use.

C. Samples: Submit three (3) representative samples of each product specified for verification.

### 1.4 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to the Drawings and other sections of the specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Manufacturer Qualifications: Provide resilient flooring manufactured by a firm with a minimum of 10 years of experience with resilient flooring of type equivalent to those specified.

1. Provide resilient flooring products, including wall base, accessories, and subfloor preparation products from one manufacturer to ensure color matching and compatibility.
2. Manufacturer shall be capable of providing technical training and technical field service representation.

C. Installer Qualifications: Acceptable to or trained by manufacturer of resilient flooring.

### 1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in labeled packages. Store and handle in strict compliance with manufacturer's recommendations. Protect from damage due to weather, excessive temperatures, and construction operations.

B. Deliver materials sufficiently in advance of installation to condition materials to the

required temperature for 48-hours prior to installation.

1.6 PROJECT CONDITIONS

A. Maintain temperature and humidity at service levels or the ambient temperature must remain steady (± 10 deg F) and be between 59 deg F and 80 deg F for at least 48-hours prior, during and 72-hours after installation. .) The ambient relative humidity is recommended to be 50% RH ± 10%; however, dew point must be avoided.

1.7 WARRANTY

A. Provide manufacturer's standard limited warranty for wear, defect, and conductivity.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Vinyl Composite Tile (F18):

1. Description: Vinyl Composite Tile
2. Location: Work Room / AV Storage
3. Manufacturer: Armstrong
4. Style: Premium Excelon Crown Texture
5. Color: Linseed 5C236
6. Size: 12 inches x 12 inches
7. Remarks: Direct Glue

B. Leveling and Patching Compound: As recommended and approved by flooring manufacturer to suit application.

C. Primers and Adhesives: Do not use adhesives that contain urea formaldehyde.

1. Flooring: As recommended and approved by flooring manufacturer to suit application.

D. Other Materials: Provide other materials, not specifically described, but required for a complete and proper installation.

2.2 EXTRA STOCK

A. Deliver to the Owner for his use:

1. Two (2) percent or one (1) unopened carton of each color and pattern of each flooring installed, whichever is greater.
2. One (1) gallon container of each type of adhesive used for flooring.

PART 3 - EXECUTION

3.1 GENERAL CONTRACTOR RESPONSIBILITIES

A. Supply a safe, climate controlled building and subfloor as detailed in manufacturer's installation guide.

B. A subfloor that meets the requirements of ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring is required, or as detailed in the in manufacturer's installation guide.

C. A secure storage area that is maintained permanently or temporarily at ambient service temperature and humidity (except walk in freezers or similar), or 68 deg F ± 5 deg F and 50% ± 10% relative humidity, for at least 48-hours prior to and during the application of the flooring, so the flooring contractor can acclimate the flooring materials is required.

D. An installation area that is weather tight and maintained either permanently or temporarily at ambient service temperature and humidity (except walk in freezers or similar), or 68 deg F ± 5 deg F and 50% ± 10% relative humidity, for at least 48-hours prior to, during and 72-hours after the application of the flooring is required.

E. Areas of the flooring that are subject to direct sunlight through doors or windows should have them covered using blinds, curtains, cardboard or similar for the time of the installation and 72-hours after the installation to allow the adhesive to cure.

F. Prevent all traffic for a minimum of 12-hours and rolling loads for 72-hours to allow the adhesive to cure. If required, after 12-hours protect the flooring from damage during construction operations using Masonite, plywood, or a similar product, ensuring first that the flooring surface is free of all debris. Lay panels so that the edges form a butt joint and tape the joint to prevent both movement and debris entrapment underneath them. Inspect immediately before covering and after removal for final acceptance.

G. Have the flooring cleaned no sooner than 72-hours (unless given written permission from the manufacturer after the installation using manufacturer's recommended system or a standard method as detailed in the appropriate manufacturer's maintenance guide.

3.2 FLOORING CONTRACTOR RESPONSIBILITIES

A. Provide trained installers that have at least one of the following:

1. Approved by flooring manufacturer for all of the requirements of the project.
2. An installation manager, to manage the project, installers, and ensure that all of the required procedures are followed as detailed in the manufacturer's installation guide.

B. Follow all requirements in the appropriate manufacturer's installation guide.

## 3.3 CLEANING AND PROTECTING

A. Remove excess adhesive and other blemishes from exposed surfaces, using neutral cleaner recommended by the manufacturer of the resilient materials.

END OF SECTION

# SECTION 09 65 30 - RESILIENT WALL BASE AND ACCESSORIES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:

1. Resilient vinyl tile flooring adhesive attached with accessories in locations shown on Drawings.
2. Resilient base adhesive attached in locations shown on Drawings.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For each type of product indicated.

C. Samples for Initial Selection: For each type of product indicated.

D. Samples for Verification: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches long, of each resilient product color, texture, and pattern required.

### 1.4 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to Drawings and other sections of the specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected. Failure to do so will not relieve the Contractor from performing the Work correctly at no additional expense to the Owner

B. Fire-Test-Response Characteristics: Provide resilient stair accessories with a critical radiant flux classification of Class I, not less than 0.45 W/sq. cm, as determined by testing identical products per ASTM E 648 by a testing and inspecting agency acceptable to authorities having jurisdiction.

### 1.5 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.6 PROJECT CONDITIONS

A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive floor tile during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After postinstallation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.

C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturers named are basis of Specification. Other manufacturers must have a minimum of five (5) years experience manufacturing products meeting or exceeding the specifications and comply with Division 01 Section “Product Requirements” regarding substitutions to be considered.

2.2 MATERIALS - ALL MATERIALS MUST BE ASBESTOS FREE

A. Rubber Base (B2):

a. Description: Rubber Base
b. Location: General
c. Manufacturer: Johnsonite
d. Style:
e. Color: 47-Brown
f. Size: 4 inches
g. Remarks: Straight at carpet surfaces; Coved at VCT surfaces

C. Underlayment and Leveling Concrete (As required to suit application): ARDEX K-15 Self-Leveling Underlayment Concrete or SD-F (Feather Finish) Self-Drying, Cement-Based Finishing Underlayment as manufactured by ARDEX ENGINEERED CEMENTS Aliquippa, PA; (724) 203-5000, or flooring manufacturer’s recommended non-shrinking water resistant Portland cement patching compound.

D. Joining and Edge Finish Moldings:

1. Usage: For use at flooring terminations with other flooring.

a. Type: Tapered or bullnose edge, as required to provide juncture at edge of adjacent floor surfaces.
b. Size: One (1) inch wide by 1/8 inch thick or as applicable to the type of flooring and condition.

c. Material: Rubber or vinyl as recommended by flooring manufacturer to suit application.
d. Color(s): As selected by Architect from manufacturer's available colors.
e. Burke Mercer Flooring Products, a Division of Burke Industries, Inc., Johnsonite, Division of Duramax, Inc., or Architect approved equal.

E. Adhesive:

1. Flooring: As recommended and approved by flooring manufacturer to suit application.
2. Base: Rubber-based type; same brand as base or as recommended and approved by base manufacturer to suit application.

F. Other Materials: Provide other materials, not specifically described but required for a complete and proper installation.

2.3 EXTRA STOCK

A. Deliver to the Owner for his use:

1. Two (2) percent or one (1) unopened carton of each color and pattern of flooring selected, whichever is greater.
2. Two (2) percent or one (1) unopened carton of each color, type, and size base selected, whichever is greater.
3. One (1) gallon container of each type adhesive used for flooring and base.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which Work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

B. The flooring, adhesive, and room temperature must be kept at a minimum temperature of 65 degrees F or warmer for at least 48 hours before, during, and 48 hours after installation.

C. Install flooring only after the jobsite has been cleaned and cleared of other trade apparatus that may damage a finished flooring installation.

3.2 PREPARATION

A. By General Contractor:

1. Verify substrates are smooth, level, at required finish elevation, and without more than 1/8 inch in 10 feet-0 inch variation from level or slopes shown on the drawings.
2. Level substrates by grinding high spots or filling low spots with cementitious subfloor filler as required.
3. Broom clean or vacuum the surfaces to be covered and inspect the substrates.

B. By Flooring Contractor:

1. Verify substrates are smooth, level, at required finish elevation, and are ready to receive resilient flooring and base.
2. Bring discrepancies to the attention of the Architect and do not proceed until such discrepancies are corrected.
3. Conduct moisture test - maximum allowable amount of moisture emission from floor is 3.0 pounds per 1,000 sq. ft. in 24 hour period.
4. Starting Work indicates acceptance of existing conditions.

## 3.3 INSTALLATION

A. General:

1. Install materials only after finishing operations, including painting, have been completed and after permanent heating and cooling system is operating.
2. Verify that moisture content of concrete slabs, building air temperature, and relative humidity are within the limits recommended by the manufacturers of the materials used.

B. Installing Resilient Flooring:

1. Install flooring fully adhered in compliance with the manufacturer's instructions.
2. Always check the cartons to assure the pattern number is correct and that the shade and lot numbers are the same on all cartons. To minimize shade variation, mix and install flooring from several different cartons.
3. Butt units tightly to vertical surfaces, nosings, edgings, and thresholds.
4. Scribe as necessary around obstructions and to produce neat joints.
5. Place flooring tightly laid, even, and in straight parallel lines.
6. Extend units into toe spaces, door reveals, and in closets and similar spaces.
7. Lay units from center marks established with principal walls, discounting minor offsets, so that units at opposite edges of the room are of equal width.
8. Adjust as necessary to avoid use of cut widths less than 3 inches wide at edge of space.
9. Lay units square to axes of the room or space.
10. Place joining and edge finish mouldings, including reducer strips tightly butted to units and secured with adhesive, providing at all unprotected edges unless otherwise shown.

C. Installing Base:

1. Install base where shown on the Drawings in accordance with manufacturer’s instructions.
2. Use factory-preformed exterior corners, and factory preformed or job-mitered interior corners.

## 3.4 CLEANING AND PROTECTING

A. Remove excess adhesive and other blemishes from exposed surfaces, using neutral cleaner recommended by the manufacturer of the resilient materials.

END OF SECTION

# SECTION 09 68 13 - CARPET TILE

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes carpet tile adhesive applied on floors where indicated on Drawings, including access flooring.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data:

1. Manufacturer’s material product data, including adhesive.
2. Manufacturer’s installation instructions.
3. Manufacturer’s maintenance instructions.

B. Samples:

1. Showing manufacturer's colors (12 inches x 12 inches) of each type carpet tile for Architect’s selection and approval.
2. Actual sample of each type carpet tile in approved color from factory to produce each run of carpet tile.

C. Shop Drawings: Showing layout of all carpet tile, and location and type of carpet tile accessories.

D. Certificates:

1. Showing information on manufacturer's mill where carpet tile was or will be produced and date of last inspection for specification tolerances.

### 1.4 DELIVERY, STORAGE AND PROTECTION

A. Deliver carpet tile to the job site in manufacturer’s unopened original cartons.

B. Store carpet tile raised above floor, under cover, in well ventilated spaces as soon as delivered.

C. Protect carpet tile from damage, dirt, stains, and moisture.

1.5 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to Drawings and other sections of the specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected. Failure to do so will not relieve the Contractor from performing the Work correctly at no additional expense to the Owner.

B. Installer Qualifications: Company with a minimum of three (3) years of experience specializing in carpet tile and carpet installation and approved by carpet manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Carpet Tile:

1. F1:

a. Description: Carpet
b. Location: Court Rooms
c. Manufacturer: Shaw Contract Group
d. Style: Skytile 5T174
e. Color: Village 72760
f. Size: 24 inch x 24 inch carpet tile
g. Remarks: Direct Glue, 1/4 turn pattern

2. F2:

a. Description: Carpet
b. Location: Corridors / Bailiff
c. Manufacturer: Shaw Contract Group
d. Style: Mica Tile/5T014
e. Color: Cinnabar 14713
f. Size: 18 inch x 36 inch carpet tile
g. Remarks: Direct Glue, 1/4 turn pattern

3. F3:

a. Description: Carpet
b. Location: Offices / Judges’s Chambers
c. Manufacturer: Shaw Contract Group
d. Style: Mica Tile/5T014
e. Color: Cinnabar 14713
f. Size: 18 inch x 36 inch carpet tile
g. Remarks: Random pattern

B. Carpet Accessories, Adhesive, and Base:

1. Standard accessories as recommended by the carpet manufacturer.
2. Underlayment and Leveling Concrete (As required to suit application): ARDEX K-15 Self-Leveling Underlayment Concrete or SD-F (Feather Finish) Self-Drying, Cement-Based Finishing Underlayment as manufactured by ARDEX ENGINEERED CEMENTS Aliquippa, PA; (724) 203-5000.
3. Adhesive as recommended by carpet manufacturer.
4. Carpet edge shall be vinyl overlap type for glue down carpet.
5. Base: As specified in Division 09 Section "Resilient Flooring and Base".

2.2 EXTRA CARPET

A. After completion of the carpet tile installation, the carpet tile contractor shall provide the following to the Owner for future carpet tile repair or replacement that may be required.

1. Three (3) percent of total yards installed of each carpet tile. This extra stock is to be in unopened cartons and does not include scraps.

PART 3 - EXECUTION

3.1 PREPARATION

A. By General Contractor:

1. Verify substrates are smooth, level, at required finish elevation, and without more than 1/8 inch in 10 feet-0 inch variation from level.
2. Level floor substrates by grinding high spots or filling low spots with latex floor leveling material as required.
3. Clean substrate free of all foreign substances, such as wax, paint, oil, etc.
4. Fill cracks and holes with latex emulsion filler compatible with carpet adhesive.
5. Broom clean or vacuum the surfaces to be covered and inspect the substrates.

B. By Flooring Contractor:

1. Verify substrates are smooth, level, at required finish elevation, and are ready to receive carpet and base on floors.
2. Bring discrepancies to the attention of the Architect and do not proceed until such discrepancies are corrected.
3. Conduct moisture test - maximum allowable amount of moisture emission from floor is three (3) pounds per 1,000 sq. ft. in 24 hour period.
4. Starting Work indicates acceptance of existing conditions.

3.2 INSTALLATION

A. General:

1. Installer must be a carpet tile manufacturer certified installer with a minimum of five (5) years experience installing carpet tile materials of the type specified for this Project.

2. Prime subfloor prior to installation in accordance with manufacturer's recommendations.
3. Adhesive adhere carpet tile directly to subfloor, including access flooring, in accordance with manufacturer's recommendations.
4. Scribe carpet tile accurately to all vertical surfaces.
5. Lay out carpet tile in specified pattern, with no fill strips less than 1/2 tile, unless otherwise noted or directed by Architect. Confirm pattern direction with Architect.
6. Roll carpet tile with a roller to insure maximum contact at the pressure recommended by the manufacturer.

3.3 CLEAN-UP AND PROTECTION

A. Remove all scraps and debris from site. Thoroughly clean all carpet tile surfaces prior to final acceptance of the carpeted areas by Owner. Leave work in neat, uniform condition, vacuumed and ready for use.

B. Spillage of adhesive on the face of the carpet tile shall be removed immediately with a clean-up solvent recommended by the manufacturer.

C. Close carpeted floor areas to traffic for at least 12 hours after installation.

D. Provide carpeted traffic areas with heavy Kraft paper or "Visqueen" to protect against damage and soiling. Provide such protection when directed by the Architect.

3.4 REPAIR

A. Carpet tile contractor shall repair all damage by his workmen.

B. Repair or replace damaged carpet tile, including that which cannot be successfully cleaned with new carpet tile at no expense to Owner.

3.5 GUARANTEE

A. The carpet tile installer shall be required to re-lay carpet tile that does not provide an attractive wrinkle-free appearance and shall correct conditions due to faulty installation which may appear for a period of one (1) year from date of Substantial Completion at no expense to Owner.

END OF SECTION

# SECTION 09 72 00 - WALL COVERINGS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes wall covering direct glued to substrates where indicated on Drawings.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For each type of product indicated. Include data on physical characteristics, durability, fade resistance, and flame-resistance characteristics.

C. Shop Drawings: Show location and extent of each wall-covering type. Indicate pattern placement, seams and termination points.

D. Samples for Initial Selection: For each type of wall covering indicated.

E. Samples for Verification: Full width by 36-inch) long section of wall covering from dye lot to be used for each type of wall covering indicated for each color, texture, and pattern required.

1. With specified treatments applied.
2. Show complete pattern repeat.
3. Mark top and face of material.

F. Schedule: For wall coverings. Use same designations indicated on Drawings.

G. Maintenance Data: For wall coverings to include in maintenance manuals.

### 1.4 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to the Drawings and other sections of the specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Fire-Test-Response Characteristics: Provide wall coverings and adhesives with the following fire-test-response characteristics as determined by testing identical products

applied with identical adhesives to substrates per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Surface-Burning Characteristics: As follows, per ASTM E 84:

   a. Flame-Spread Index: 25 or less.
   b. Smoke-Developed Index: 450 or less.

2. Fire-Growth Contribution: Textile wall coverings tested according to NFPA 265 and complying with Method A test protocol in IBC.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not install wall coverings until work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Lighting: Do not install wall covering until a lighting level of not less than 15 fc (160 lux) or a permanent level of lighting is provided on the surfaces to receive wall covering.

C. Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by wall-covering manufacturer for full drying or curing.

1.6 EXTRA MATERIALS

A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Rolls of Wall-Covering Material: Full-size units equal to five (5) percent of the amount of each type installed.

PART 2 - PRODUCTS

2.1 WALL COVERING PRODUCTS

A. General: Provide rolls of each type of wall covering from the same run number or dye lot.

B. Wall Covering (W14):

1. Description: Wall Covering
2. Location: Court Rooms
3. Manufacturer: Maharan
4. Style: Tek-Wall Slate
5. Color: Treasure 009
6. Size: 54 inches wide
7. Remarks: Install over acoustical infill, Unbacked - 100% Polyolefin, perforated backing, rotate pattern to be horizontal

2.2 ACCESSORIES

A. Adhesive: Mildew-resistant, nonstaining, strippable adhesive, for use with specific wall covering and substrate application, as recommended in writing by wall-covering manufacturer.

B. Primer/Sealer: Mildew-resistant primer/sealer complying with requirements in Division 09 Section “Painting and Staining” and recommended in writing by wall-covering manufacturer for intended substrate.

C. Wall Liner: Nonwoven, synthetic underlayment and adhesive as recommended by wall-covering manufacturer.

D. Seam Tape: As recommended in writing by wall-covering manufacturer.

E. Metal Primer: Interior ferrous metal primer complying with Division 09 Section “Painting and Staining”.

F. Wood Trim: Square edge, with butted joints, and eased edges as specified in Division 06 Section “Interior Architectural Woodwork”.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for levelness, wall plumbness, maximum moisture content, and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation.

B. Clean substrates of substances that could impair wall covering's bond, including mold, mildew, oil, grease, incompatible primers, dirt, and dust.

C. Prepare substrates to achieve a smooth, dry, clean, structurally sound surface free of flaking, unsound coatings, cracks, and defects.

1. Moisture Content: Maximum of 5 percent on new plaster, concrete, and concrete masonry units when tested with an electronic moisture meter.
2. Plaster: Allow new plaster to cure. Neutralize areas of high alkalinity.
3. Metals: If not factory primed, clean and apply metal primer.
4. Gypsum Board: Prime with primer recommended by wall-covering manufacturer.
5. Painted Surfaces: Treat areas susceptible to pigment bleeding.

D. Check painted surfaces for pigment bleeding. Sand gloss, semigloss, and eggshell finishes

with fine sandpaper.

E. Remove hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

F. Acclimatize wall-covering materials by removing them from packaging in the installation areas not less than 24 hours before installation.

G. Install wall liner, with no gaps or overlaps, where required by wall-covering manufacturer. Form smooth wrinkle-free surface for finished installation. Do not begin wall-covering installation until wall liner has dried.

3.3 INSTALLATION

A. General: Comply with wall-covering manufacturers' written installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Cut wall-covering strips in roll number sequence. Change roll numbers at partition breaks and corners.

C. Install strips in same order as cut from roll.

D. Install reversing every other strip.

E. Install wall covering with no gaps or overlaps, no lifted or curling edges, and no visible shrinkage.

F. Match pattern 72 inches (1830 mm) above the finish floor, unless indicated otherwise.

G. Install seams vertical and plumb at least 6 inches (150 mm) from outside corners and 3 inches (75 mm) from inside corners unless a change of pattern or color exists at corner. No horizontal seams are permitted.

H. Fully bond wall covering to substrate. Remove air bubbles, wrinkles, blisters, and other defects.

I. Trim edges and seams for color uniformity, pattern match, and tight closure. Butt seams without any overlay or spacing between strips.

3.4 CLEANING

A. Remove excess adhesive at finished seams, perimeter edges, and adjacent surfaces.

B. Use cleaning methods recommended in writing by wall-covering manufacturer.

C. Replace strips that cannot be cleaned.

D. Reinstall hardware and hardware accessories, electrical plates and covers, light fixture

trims, and similar items.

END OF SECTION

# SECTION 09 90 00 - PAINTING AND STAINING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes Surface preparation and application of paints and stains on interior substrates.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.4 DEFINITIONS

A. Conform to definitions of terms in ASTM D16 in interpreting requirements of this Section.

### 1.5 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Material lists. Give the supplier's name, product name, number and generic description of each proposed product and its use. Provide product data sheets and MSDS sheets for each product. Include VOC content.

C. Samples. Submit full range of colors, patterns, textures and finishes available for selection, including the following:

1. Color Chips: Provide complete duplicate sets of color chips for color selection.
2. Small Applied Samples: Provide pieces of actual material on which paint will occur with minimum dry mil thickness of specified paint. Provide painted 12 inch x 12 inch actual gypsum wallboard samples with approved textures for Architect’s approval. Approved samples will become standard for which all work will be judged.
3. Sheen Samples: Provide full range of varying sheens when sheens are controllable by intermixing.

C. Installed Samples. Provide large size samples for approval. Approved samples may be left in place as part of the work.

D. One room and/or area, as selected by the Architect, shall be painted with materials specified or accepted and applied directly from container, unthinned. After acceptance by Architect, room and/or area shall be standard of quality of entire project.

E. Certification:

1. Furnish a letter certifying that materials submitted are truly equivalent or better than those called out in the finish schedule.
2. Furnish certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).

1.6 RESPONSIBILITY OF COORDINATION

A. Coordinate the work specified herein with the following work:

1. Provide information to preceding trades for proper preparation of substrate.
2. Inspect substrate before proceeding to verify proper preparation.
3. Notify the Architect of any item to receive paint which may not be covered by a scheduled finish type. Architect will furnish appropriate specification.

1.7 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to Drawings and other sections of the specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Materials:

1. Delivery and Storage: Products shall be delivered to jobsite in unopened containers bearing manufacturer's labels intact and legible at time of use. Storage shall be in designated areas away from excessive heat and open flames and in accordance with manufacturer’s recommendations.
2. Quality or Grade:

a. Paints and coatings shall be the manufacturer’s highest professional quality material of types specified and shall be applied directly from containers in which material is purchased, except where thinning is recommended by manufacturer and approved by Architect to suit intended use, i.e. painting acoustical tile or panels without destroying their acoustical properties.
b. Primers and other undercoat paints shall be those produced by same manufacturer as finish coats.
c. Thinners shall be those recommended by paint manufacturer's printed instructions.

3. Equipment:

a. Spray Equipment: Shall be the type recommended for the application and shall be maintained clean and in proper working order.
b. Brushes, Rollers, etc.:
1) Shall be new of the various sizes and types recommended for each application.
2) Shall be properly cleaned and stored in accordance with manufacturer’s instructions at the end of each days’ use.

3) Shall be replaced as often as necessary to attain the best finish quality in the Work.

4. Application:

a. Applicator:
1) Shall be person(s) or entity specializing in application of paints and coatings of types specified with minimum five (5) years experience.
2) Shall provide Owner and Architect a notarized certification that paint used is as specified.

b. Application:
1) Shall not proceed on surfaces which are not suitable to be painted, until such surfaces have been corrected. Notify Architect in writing of which surfaces need to be corrected and their locations. Surfaces shall be corrected by the responsible trades. Surfaces not suitable for painting shall include, but not be limited to:
a) Damaged surfaces.
b) Oily, greasy, dusty or excessively soiled surfaces.
c) Non-dressed welds which will be exposed to view.
d) Lack of touch-up where specified.
e) Rusted or excessively deteriorated shop-prime painted surfaces.

2) Number of coats of each of several finishes shall be in accordance with detailed specifications, which will produce first quality finish if properly applied. If number of coats specified fails to produce a finish acceptable to Architect, this Contractor shall apply additional coat or coats at his own expense until acceptable finish is achieved

1.8 PRODUCT HANDLING

A. Store only approved materials at the jobsite, and store only in a suitable and designated area restricted to the storage of paint materials and related equipment.

B. Temperature in the storage area shall be between 40 degrees F and 110 degrees F. Open and mix all materials in the storage area.

C. Use all means necessary to protect materials before, during, and after application and to protect the installed work and materials of all other trades.

D. Apply water-base paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 degrees F and 90 degrees F, unless otherwise permitted by paint manufacturer's printed instructions.

E. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 degrees F and 95 F, unless otherwise permitted by paint manufacturer's printed instructions.

F. Do not paint in snow, rain, fog or mist, or when relative humidity exceeds 85 percent, or to damp or wet surfaces, unless otherwise permitted by paint manufacturer's printed instructions. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

1.9 WARRANTY

A. The undertaking of a painting subcontract will indicate that the subcontractor will warrant the work specified herein for two years against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials and workmanship.

B. Defects shall include by not be limited to the following:

1. Discoloring noticeably by yellowing, streaking, blooming, changing color or darkening
2. Mildewing
3. Peeling, cracking, blistering, alligatoring or releasing from the substrate
4. Chalking or dusting excessively
5. Changing sheen in irregular fashion
6. Softening or becoming tacky
7. Bubbling

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. All paint materials selected for coating systems for each type of surface shall be the product of a single manufacturer and shall, as a system, have flame spread, fuel contribution, and smoke density test results less than 25.

B. Manufacturers: Subject to compliance with requirements, provide products by the following as selected by the Architect:

1. Sherwin-Williams Company (The).

2.2 MATERIALS

A. Paint and Coatings: Ready mixed, except for field catalyzed coatings; having good flow and brushing properties and consistent drying or curing behavior, free of sags and streaks.

B. Accessory Materials: Linseed oil, turpentine, paint thinners and other materials recommended by paint and coatings manufacturer as necessary to achieve finishes specified.

C. Patching and Surface Preparation: Latex fillers as recommended by paint and coatings manufacturer.

2.3 COLORS

A. Colors shall be as selected by Architect. Different colors may be selected for each room, and more than one color may be selected in each room.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that site environmental conditions are appropriate and substrates are in proper condition to receive Work of this Section.

B. Verify that shop applied primers are compatible with specified finish coats.

C. Measure moisture content of surfaces using an electronic moisture meter. Do not begin application of coatings unless moisture content of surfaces is below the following maximum values:

1. Gypsum soffits: 12 percent.
2. Plaster: 12 percent.
3. Masonry surfaces: 12 percent.
4. Wood surfaces: 15 percent.
5. Vertical concrete surfaces: 12 percent.
6. Horizontal concrete surfaces: 8 percent.

3.2 ITEMS TO RECEIVE PAINT

A. Generally, all new items that are normally painted in any typical building, including but not limited to the following list:

1. All ferrous metal
2. All paint grade interior wood
3. All prime coated hardware
4. All exposed conduit, outlet boxes and electrical cabinets, excluding those located in mechanical rooms.
5. All exposed pipe, plumbing, and ductwork, including those located in mechanical rooms.
6. All metal grilles, except aluminum, unless otherwise indicated.
7. All exposed gypsum board surfaces, including all mechanical rooms.
8. All exposed concrete masonry units (CMU), including all mechanical rooms.
9. Miscellaneous other items which normally require painting or are scheduled to be painted.
10. Consult plans, finish schedule, details and specifications for other trades as all items usually field painted or finish will be considered as part of the Contract.
11. All exposed structure scheduled or noted to receive paint.

B. All work where a coat of material has been applied must be inspected and approved by Architect before application of succeeding specified coat, otherwise no credit for coat applied will be given. Notify Architect when a particular coat has been completed for inspection and approval. Apply coats of material in strict accordance with manufacturer's specifications except where requirements of these specifications are in excess of

manufacturer's requirements. Paint all sight exposed pipe and plumbing only after all mechanical work and tests have been completed.

3.3 PREPARATION

A. General: Surface must be clean to insure adhesion. Remove oil and grease with paint thinner. Wash off dirt with warm soapy water and rinse with clean water. Remove rust by wire brushing or sanding.

B. Wall surfaces must be dry before painting. Verify with moisture meter.

C. Unfinished Surfaces:

1. Wood: Sand smooth and apply one (1) coat of Primer Undercoat. After primer has dried overnight, putty nail holes and cracks, then spot-prime putty with primer. Again, allow the primer to dry over- night, sand lightly and topcoat.
2. Masonry and Concrete: Remove efflorescence or cement dust on masonry and concrete by etching with a 10 percent solution or muriatic (Hydrochloric) acid. Flush off surface after etching with clean water, and paint while still damp. On surface where muriatic acid cannot be used to neutralize the efflorescence, remove the efflorescence by sanding, scraping or wire brushing and apply a coat of Masonry Conditioner before painting. If efflorescence is not present, no primer is necessary on concrete and masonry surfaces. Fill voids and pores in concrete and haydite blocks with Latex Block Filler and allow to dry overnight before topcoating.
3. Iron and Steel: Prime with Metal Primer and allow to dry overnight before topcoating.
4. Galvanized Metal: Prime with galvanized metal primer and allow to dry overnight before topcoating.

3.4 APPLICATION

A. General: Surfaces to be finished must be clean, dry and free of dirt, oils, loose paint or any other contamination that would adversely affect adhesion, protective properties or appearance of the coating.

B. Paint Thickness: Provide the following minimum dry film thickness per coat unless noted otherwise:

1. Enamels on Metal: 1 mil
2. Latex Paints: 1 mil
3. Metal Primers: 1.5 mils
4. Undercoats: 1.5 mils
5. Oil Paints: 1.5 mils
6. Epoxy Coating: 2.0 mils
7. Thickness test: Use observation gauge that measures "V" shape scratch.

C. Allow exterior paints to dry 72 hours between coats and interior paint to dry 24 hours between coats. Allow all enamels and varnishes to dry 24 hours between coats. If enamel and varnishes are tacky after 24 hours, allow additional time until finish is dry.

D. Leveling: Apply with proper consistency and quality so paint flows out to a level surface free of brush and roller marks, bubbles, dust, runs, sags, and holidays. Spread evenly.

E. Appearance: Uniform color, texture and sheen.

F. Neatness: Paint shall not be smeared, spattered or run over adjoining colors or materials. Cut-on lines shall be straight.

G. First coat shall be white, unless otherwise specified.

3.5 CLEANING AND PROTECTION

A. Keep project premises free of painting-related debris. Collect material that may constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. Protect work adjacent to painting operations from paint spatters and spills. Immediately remove paint that falls on finished surfaces not scheduled to receive paint, using materials and techniques that will not damage affected surfaces.

3.6 SCHEDULE

A. Paint items indicated on the Drawings. If not indicated, the following schedule of typical painted items shall apply, but does not specifically include every item that is to receive paint, but rather should establish type and quality of finish for all items normally included in a complete paint job. Provide materials and products that result in colors and textures of exposed painted surfaces complying with those indicated in Finish Schedule on Drawings.

B. Interior Surfaces:

1. Paint (W1):

a. Description: Paint
b. Location: Judge’s Chambers Accent
c. Manufacturer: Sherwin Williams
d. Color: Baguette SW 6123
e. Remarks: For repairs in existing corridors as necessary

2. Paint (W2):

a. Description: Paint
b. Location: General
c. Manufacturer: Sherwin Williams
d. Color: Natural Tan SW7567

3. Concrete Paint (W19)

a. Description: Concrete Paint
b. Location: Holding Areas
c. Manufacturer: Sherwin Williams
d. Color: Barcelona Beige SW 7530

e. Remarks: Epoxy Paint

4. Paint (W22):

a. Description: Paint
b. Location: Corridor
c. Manufacturer: Sherwin Williams
d. Color: Barcelona Beige SW 7530

5. Paint (23)

a. Description: Paint
b. Location: Restrooms
c. Manufacturer: Sherwin Williams
d. Color: Portico SW 7548

END OF SECTION

# SECTION 10 28 13 - TOILET ACCESSORIES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section Includes:

1. Public-use washroom accessories.
2. Custodial accessories.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: For each type of product indicated. Include the following:

1. Construction details and dimensions.
2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
3. Material and finish descriptions.
4. Features that will be included for Project.
5. Manufacturer's warranty.

C. Samples: Full size, for each accessory item to verify design, operation, and finish requirements.

1. Approved full-size Samples will be returned and may be used in the Work.

D. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated on Drawings.

E. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

### 1.4 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to Drawings and other sections of the specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Source Limitations: For products listed together in the same articles in Part 2, provide products of same manufacturer unless otherwise approved by Architect.

1.5 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.6 WARRANTY

A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PUBLIC-USE WASHROOM ACCESSORIES

A. Basis-of-Design Product: The design for accessories is based on products of Bobrick Washroom Equipment, Inc., unless indicated otherwise. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. A & J Washroom Accessories, Inc.
2. American Specialties, Inc.
3. Bradley Corporation.
4. General Accessory Manufacturing Co. (GAMCO).

B. Liquid-Soap Dispenser:

1. Basis-of-Design Product: B-822.
2. Description: Lavatory-mounted soap dispenser shall dispense liquid soaps, lotions, and detergents. Valve shall be operable with one hand and require less than 5 lb. of force to comply with ADA Accessibility Guidelines (ADAAG). Piston shall have arcs and radiuses on top and sides complementing other Bobrick Contura™ Series accessories in the washroom. Stainless steel spout shall rotate 360 degrees without damage to valve mechanism. Cover shall lock to body with concealed locking mechanism opened only with special key provided. Piston, spout and supply tube assembly shall be removable for top filling and maintenance. Shank shall accommodate up to 4 inches mounting thickness.
3. Capacity: 34 fl.oz.

C. Mirror Unit:

1. Basis-of-Design Product: B-165.

2. Description: Mirror shall have one-piece, polished stainless steel 1/2 inch x 1/2 inch x 1/2 inch channel frame. Mirror frame shall have 90 degree uniform corners; open or uneven mitered corners are not acceptable. Mirror shall be No. 1 quality, 1/4 inch float/plate glass. All mirror edges shall be protected by filler strips. Mirror back shall be protected by full-size shock absorbing, water-resistant, non-abrasive 1/8 inch thick polyethylene padding. Galvanized steel back with formed edges for additional strength shall have integral hanging brackets for mounting on concealed one-piece rectangular wall hanger(s). Mirror shall be secured to hanger with concealed Phillips head locking setscrews in bottom of frame.
3. Size: As indicated on Drawings.

B. LiquidMate® Liquid Soap Dispenser:

1. Basis-of-Design Product: B-155
2. Description: Liquid soap dispenser shall have chrome-plated ABS plastic mounting bracket and collar and translucent polyethylene container. Corrosion-resistant valve shall dispense thin, free-flowing vegetable oil soaps and synthetic detergents.
3. Capacity: 24 fl. oz.

C. Concealed Anchor Plates for Stud Wall Construction:

1. Basis-of-Design Product: TB-49:
2. Description: Concealed anchor plate for stud wall construction shall be 3-inch, 12-gauge galvanized steel with 1/4 inch-20 threaded, extruded holes to give 0.200-inch minimum length of usable thread per hole; and shall be furnished with the required number of 1/4 inch-20 x 2 inch stainless steel machine screws for attaching grab bar.

D. 1-1/4 Inch Diameter Stainless Steel Grab Bars with Snap Flange:

1. Basis-of-Design Product: B-5806
2. Description: Grab bar and concealed mounting plates shall be constructed of type-304 stainless steel with satin finish. Grab bar shall have wall thickness of 18-gauge and outside diameter of 1-1/4 inches. Distance from inside of grab bar to finished wall shall be 1-1/2 inches. Flanges shall be 1/8 inch thick stainless steel plate, 2 inches x 3-1/8 inches in diameter, and each shall have two screws holes. Flange covers shall be 22-gauge and shall snap over mounting flanges to conceal mounting screws. Grab bar shall have 90 degree return to flange. Ends of grab bar shall pass through flanges and be heliarc welded to form one structural unit.
3. Length: As indicated on Drawings.

E. In-Sight® Sanitouch® HRT 1.5” HUB:

1. Basis-of-Design Product: 09990
2. Description: Made of high-impact plastic with smoled transparent cover with gray back. Dispenser automaticall advances and cuts a nominal 12 inches of

towel when activated by pulling exposed towel. No-touch dispensing system helps minimize the spread of dirt and germs. Dispenses one 8 inch diameter roll with 1.5 inch cores. Features include emergency feed knob and choice of key-activated spring lock or push button operation.

3. Dimensions: 12.63 inches wide x 10.2 inches deep x 16.13 inches high.

F. Recessed Waste Receptacle:

1. Basis-of-Design Product: B-3644
2. Description: Recessed waste receptacle shall be constructed of type-304 stainless steel with satin finish. Flange shall be 22-gauge, drawn, one-piece, seamless beveled construction. Waste receptacle shall be constructed of 22-gauge stainless steel and shall be removable for emptying. Waste receptacle shall be secured to cabinet by tumbler lock and top and bottom edges shall be hemmed for safe handling.

G. Surface-Mounted Waste Receptacle:

1. Basis-of-Design Product: B-279
2. Description: Surface-mounted waste receptacle shall be constructed entirely of type-304 stainless steel. Exposed surfaces shall have satin finish. Bottom edges of unit shall be hemmed for safe handling. Waste receptacle shall be furnished with removable heavy-gauge vinyl liner.
3. Capacity: Minimum 6.4 gal.

H. Recessed Toilet Seat Cover Dispenser and Toilet Tissue Dispenser:

1. Basis-of-Design Product: B-3474
2. Description: Recessed toilet seat cover dispenser and toilet tissue dispenser shall be constructed of type-304 stainless steel with satin finish and all-welded construction. Flanges shall be 22-gauge, drawn and beveled, one-piece, seamless construction. Unit shall mount against side wall of barrier-free toilet compartment to allow clearance of grab bar across front of unit. Door shall be 18-gauge one-piece, seamless construction, secured to cabinet with full-length stainless steel piano hinge and equipped with a tumbler lock. Toilet seat cover dispenser shall be equipped with plastic sight barrier and holds 1000 paper toilet seat covers. Unit shall be equipped with two theft-resistant, high-impact polyethylene toilet tissue spindles that hold standard core rolls up to 5-1/4 inch diameter (1800 sheets).

I. Recessed Toilet Seat Cover Dispenser, Sanitary Napkin Disposal and Toilet Tissue Dispenser:

1. Basis-of-Design Product: B-3574
2. Description: Recessed toilet seat cover dispenser, sanitary napkin disposal, and toilet tissue dispenser shall be constructed of type-304 stainless steel with satin finish and all-welded construction. Flanges shall be 22-gauge, drawn and beveled, one-piece, seamless construction. Unit shall mount against side wall of barrier-free toilet compartment to allow clearance of grab bar across front of unit. Door shall be 18-gauge one-piece, seamless construction, secured to cabinet with full-length stainless steel piano hinge and equipped with a tumbler lock. Self-

closing disposal panel door shall be secured to door with spring-loaded, full-length stainless steel piano hinge and be equipped with international graphic symbol identifying usage. Disposal shall be furnished with a removable, leak-proof, molded polyethylene receptacle with capacity of 0.8 gal.. Toilet seat cover dispenser shall be equipped with plastic sight barrier and holds 1000 paper toilet seat covers. Unit shall be equipped with two theft-resistant, high-impact polyethylene toilet tissue spindles that hold standard core rolls up to 5-1/4 inch diameter (1800 sheets).

2.2 CUSTODIAL ACCESSORIES

A. Basis-of-Design Product: The design for accessories is based on products of Bobrick Washroom Equipment, Inc. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. A & J Washroom Accessories, Inc.
2. American Specialties, Inc.
3. Bradley Corporation.
4. General Accessory Manufacturing Co. (GAMCO).

B. Mop and Broom Holder:

1. Basis-of-Design Product: B-223 x 36.
2. Description: Mop and broom holder shall be constructed of type-304 stainless steel with satin finish. Shelf shall be 8 inches deep and have 1-1/2 inch return for maximum rigidity. Unit shall be equipped with replaceable, spring-loaded rubber cams that will securely hold handles from 7/8 inch to 1-1/4 inches in diameter.

2.3 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to method in ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION

# SECTION 10 52 00 - FIRE PROTECTION SPECIALTIES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes fire extinguishers, cabinets, and accessories where indicated on Drawings.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to Drawings and other sections of the specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Standard for Portable Fire Extinguishers".

C. Provide portable fire extinguishers which comply with applicable UL standard and are labeled by UL. The label, type, and specific location of the fire extinguishers shall be in accordance with the 2006 International Fire Code.

D. Provide portable fire extinguishers and cabinets by one manufacturer, unless otherwise acceptable to Architect.

### 1.4 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Submit manufacturer's technical data and installation instructions for all fire extinguishers and cabinets required. For fire extinguisher cabinets include roughing-in dimensions, and details showing mounting methods, relationships to surrounding construction, door hardware, cabinet type and materials, trim style and door construction, style, and materials. Where color selection is required include color charts showing full range of manufacturer's standard colors and designs available.

## PART 2 - PRODUCTS

### 2.1 FIRE EXTINGUISHERS

A. Provide fire extinguishers for each location indicated on the drawings, in colors and

finishes selected from manufacturer's standard which comply with requirements of governing authorities. Fill and service extinguishers to comply with requirements of governing authorities and manufacturer's requirements. Abbreviations indicated below to identify extinguisher types relate to UL classification and ratings system and not, necessarily, to type and amount of extinguishing material contained in extinguisher.

B. Provide Dry Chemical fire extinguishers, UL rated 4A-60B:C, 10 lb. nominal capacity, in enameled steel container, for Class A, B, and C fires complying with J.L. Industries "Cosmic 10E ", or Architect approved equal by Larsen's Manufacturing Co., or Potter-Roemer, Inc.

2.2 FIRE EXTINGUISHER CABINETS

A. Provide fire extinguisher cabinets where indicated. Provide sizes required for housing specified or indicated on Drawings for fire extinguishers, and as follows:

1. Semi - Recessed:

a. Manufacturer's standard enameled steel semi-recessed box with solid door, rolled edge Academy Series manufactured by J.L. Industries, or Architect approved equal by Larsen's Manufacturing Co., or Potter-Roemer.

2. Semi - Recessed Security Type:

a. Manufacturer's heavy gauge enameled steel semi-recessed box with solid door, rolled edge Security Cabinets (SFC) Series manufactured by J.L. Industries, or Architect approved equal by Larsen's Manufacturing Co., or Potter-Roemer.

2.3 MOUNTING UPPER-LOWER BRACKETS

A. Provide manufacturer's standard bracket designed to prevent accidental dislodgement of extinguisher, of proper size for type and capacity of extinguisher indicated, in manufacturer's standard plated finish.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install items included in this Section in locations and heights indicated on drawings, or at heights complying with applicable regulations of governing authorities.

B. Securely fasten cabinet to substrate construction, square and plumb, to comply with manufacturer's instructions.

END OF SECTION

# SECTION 11 90 00–DETENTION EQUIPMENT

## PART 1 - GENERAL

### 1.1 OVERALL

A. General:

1. Furnish all labor, materials, tools, equipment, and services for all detention equipment work as indicated, in accord with provisions of these specifications and all Contract Documents.
2. Comply with all requirements as outlined in General, Special, and Supplemental Conditions and Division 1 of these documents.
3. See Detention Door & Window Schedules in Section 11 19 40.
4. See Architectural Drawings with an “A” prefix.

B. Abbreviations

1. See Abbreviations in Detention Door and Window Schedules.
2. DEC: Detention Equipment Contractor.
3. ESS: Electronics Systems Subcontractor. (See Division 28)
4. CM/GC: Construction Manager and/or General Contractor.

C. Security Fasteners:

1. All equipment specified herein shall utilize only security-type fasteners where removable fasteners are allowed in the construction of the item or required for anchorage.
2. *Security fasteners for this project shall be Torx-type, with center-pin reject feature. All fasteners shall be of the same type in sizes and lengths as required for the specific application. All fasteners exposed to inmates on all items furnished under these sections shall be Security fasteners. The term "exposed to inmates" includes items exposed while operating such as lock strikes, hinges, etc.*
3. *Should the approved security fasteners not be available for a particular application; the DEC shall submit written request for substitution. This substitution may affect the entire project, as the intent is to provide the Owner with a single type of Security fastener throughout the work.*
4. *The DEC shall furnish Attic stock of 10% for each fastener size, material and style used in the work. This stock shall be organized and packaged when submitted; each package shall be clearly labeled by type and sizes. The DEC shall furnish 3 sets of wrenches I driver bits that corresponds with the fasteners used on the project.*
5. Furnish exposed fasteners in color and finish to match item fastened. Furnish fasteners of the same metal as item fastened, except use plated brass or stainless steel for all aluminum items.

D. Security Levels:

1. Throughout the Detention Equipment documents reference is made to Security Levels

required on this project. Defined in terms of time; these levels are as follows (Note: Not all levels are used on every project):

a. Level 1 = 60 minutes
b. Level 2 = 40 minutes
c. Level 3 = 20 minutes
d. Level 4 = 10 minutes
e. N = None Required
f. SP = Special (see specs)
g. BR = Level 1 plus Ballistics (see specs)

2. These levels are derived from the standards and test methods published by ASTM Committee F33, on Detention and Correctional Facilities. See each product section for specific standards and tests applicable for each component to insure compliance with these levels of security as applied to this project.

1.2 SUMMARY

A. A single Detention Equipment Contractor (DEC); listed as approved herein or having met "Pre- Qualification Requirements" of this Section and/or having been approved by Addendum, shall assume control and accountability for furnishing and installing Detention Equipment as specified herein and fully coordinating that work with the Electronics Security Subcontractor (ESS) providing the Electronic Security Systems as outlined in specification Division 28.

B. Detention work required by, but not specified in, this Section includes the following:

1. Section 11 19 10 Detention Hollow Metal
2. Section 11 19 20 Security Locks and Hardware
3. Section 11 19 30 Detention Locking Devices
4. Section 11 19 40 Detention Schedules
5. Section 11 19 50 Security Glass and Glazing
6. Section 11 19 60 Detention Furniture and Accessories
7. Section 11 19 70 Security Metal Ceilings

C. Related work specified elsewhere:

1. Access panels (except as specified herein)
2. Division 23; Security grilles at mechanical openings at walls, roof and ducts.
3. Miscellaneous steel embedded anchoring plates, angles, channels, and similar items, except as required for equipment under this Section.
4. Division 26; Electrical work (except as specified herein)
5. Division 28; Security Electronics work (except as specified herein)
6. Control work or annunciation (except as specified herein)
7. Security caulking and sealant.
8. Division 05; Tamper-Proof Metal Fasteners
9. Unit masonry (for grouting of frames).
10. Finish painting (except as specified herein)
11. Final cleaning.

D. The DEC shall integrate and interface the products and systems specified in this Section and Division 28 in accordance with approved shop drawings and submittals and in compliance with the Contract Documents.

E. Prior to bid, the DEC shall examine the Drawings and Specifications for work by other trades that may influence the installation of the work defined in this Section. The DEC shall include in their Bid all services attributed to coordinating the installation of the detention equipment with the work of other trades.

F. Prior to the start of work, the DEC shall review the Project Drawings and Specifications and shall coordinate his Work with that of all other trades.

G. The DEC shall study the entire set of Contract Documents, both written and illustrated, and shall be responsible for all requirements, both explicit and implied, to implement the intent of the design of the detention equipment specified herein.

H. The DEC shall staff the project with personnel under their employ, who are experienced in the fabrication and installation of detention equipment and the products specified herein.

## 1.3 QUALITY ASSURANCE

A. The Detention Equipment Contractors on this project must be pre-qualified. The following DEC's are pre-qualified for this work:

| | | |
|---|---|---|
| 1. | I.S.I. Detention Inc. | San Antonio, Texas |
| 2. | CCC Group Inc. | San Antonio, Texas |
| 3. | Southern Steel Company | San Antonio, Texas |
| 4. | Norment Industries | Montgomery, Alabama |
| 5. | Cornerstone | Tanner, Alabama |
| 6. | Chief Industries, Inc. | Grand Island, Nebraska |
| 7. | Noah Detention Construction | Niceville, Florida |
| 8. | C. A. Owens & Associates, Inc. | Freeport, Florida |

B. Approval of a firm as a DEC does not relieve that DEC from furnishing products and materials from the manufacturers specified.(see individual11 19 xx sections)

C. Other DEC firms interested in obtaining approval to bid this project must contact the CM/GC prior to Bid.

D. Qualifications of Manufacturers: Throughout the specifications and drawings, types of materials may be approved and specified by the manufacturer's name and catalog number in order to establish standards of quality and performance. If the bidder elects to substitute, they must request the Architect's approval in writing no less than 14 days prior to bid date. If approved, notification shall be acknowledged by Addendum prior to bid date. Verbal approval will not satisfy this requirement. Subsequent submittals by non-approved manufacturers will not be opened. Grounds for disqualification shall exist if it is found that the information submitted for approval is inaccurate or does not satisfy the following qualification requirements.

1. In every category listed hereinafter, the products/materials shall be provided by

manufacturing firms, who at present, have not less than the stated years of successful experience with and are presently actively engaged in the design and manufacture of the products listed within that section of the types required for this project. (NOTE: In the case of Security items that experience must be specifically within the Corrections industry.)

2. See the appropriate Section of these specifications for approved manufacturers. Approved manufacturers may be listed there in which deviate from these experience requirements based solely upon the Architect's /Consultant's successful experience with that manufacturer on past projects.

E. Supervision: The successful DEC shall assign an experienced, site-based project superintendent to the project on a permanent basis upon the initiation of installation of its work. This superintendent shall remain assigned to the site until all punch list items are completed. The DEC shall agree to replace the superintendent only with the written agreement of the Owner.

1.4 SUBMITTALS

A. General: Submittals shall be made in accordance with procedures outlined in Division I, Section 01 33 00, and as listed herein.

B. Quality and Control: The DEC will extensively check each of the submittals under their scope of work prior to submittal, ensuring their correctness and compatibility, not only with each other, but also with the Contract Documents. The DEC shall specifically coordinate all hardware, locking devices, and glazing with the hollow metal. The DEC will promptly notify the CM/CM/GC and Architect of any discrepancies, conflicts, errors, etc., which become apparent during the preparation of submittals.

1. The DEC shall develop and submit complete submittals and do so in a timely manner. By failing to do so, the DEC agrees to be fully responsible for any and all damages that might be occasioned by the DEC's failure to do so. Review of submittals shall be limited to 2 submissions. The Architect shall be compensated for additional reviews.

2. Review of shop drawings or schedules by the Architect shall not relieve the DEC from responsibility for deviations from drawings or specifications, unless they have, in writing, called attention to such deviations at the time of submission and secured written approval; nor shall it relieve them from responsibility for errors in shop drawings or schedules.

3. Submittals for individual systems and equipment assemblies that consist of more than one item or component shall be made for the system or assembly as a whole. Partial submittals will not be considered. Partial submittals will be returned at the expense of the DEC.

4. The DEC shall schedule a submittal review meeting for the purpose of initial submittal review for this Section of work. The meeting shall be scheduled and held within 60 days of award of contract. Notify the Architect three weeks in advance of proposed meeting date. Provide 2 sets of submittals to the Architect two weeks prior to the meeting. The pre-submittal review meeting will be held in the Architect's offices. If submittals are not sufficiently complete for proper review, an additional

meeting will be scheduled at the expense of the DEC.

C. Shop Drawings (General): Shop drawings showing all Hollow Metal constructions shall be submitted for approval. All shop drawings shall be scale. All shop drawings shall clearly indicate each item's location, size, type of materials, construction, finishes, spacing of anchors and joinery details with adjacent work.

1. Hollow Metal Drawings: Shop drawings showing all Hollow Metal constructions shall be submitted for approval. They shall clearly indicate item location, size, type of materials, construction, finishes, spacing of anchors and joinery details with adjacent work. The Hollow Metal Submittal shall include a complete 'Opening Schedule' showing all door and window openings. (Also-See Locking Device coordination drawings).

2. Locking Device Coordination Drawings: Shop drawings showing all Locking Device constructions shall be submitted for approval. They shall clearly indicate item location, size, type of materials, construction, finishes, spacing of anchors and joinery details with adjacent work. The Locking Device coordination drawings shall combine the Locking Device submittal drawings and the affected Hollow Metal frames into one, coordinated package.

3. Detention Equipment Drawings: Shop drawings showing all Detention Equipment (Furniture and Accessories) shall be submitted for approval. They shall clearly indicate item location, size, type of materials, construction, finishes, spacing of anchors and joinery details with adjacent work.

D. Schedules (General): Schedules and/or templates on all materials and equipment of this Section shall be submitted for approval. They shall clearly indicate each item's location, size, type of materials, construction, finishes, spacing of anchors and joinery details with adjacent work.

1. Security Hardware Schedule: The DEC shall provide a complete Security Door/Hardware Schedule. This submittal shall include ALL openings provided under this section. The DEC shall cross-reference their hardware set numbers with the hardware set numbers used within the Contract Documents. The submittal shall include cut sheets of all products included therein.

2. Security Glass/Glazing Schedule: The DEC shall provide a complete Security Glass/ Glazing Schedule. This submittal shall include ALL openings provided under this section. The DEC shall cross-reference the glass types with those used within the Contract Documents. . The submittal shall include cut sheets of all products included therein. Product Data: Submit manufacturer's printed technical product data and catalog sheets indicating product characteristics, performance and limiting criteria.

3. Keying Schedule: The DEC shall provide a preliminary keying schedule for ALL openings provided under this section. The DEC shall attend a meeting with the Design Team and user to review the Hardware Schedule and the proposed keying. (See section 11 19 20 – Security Locks and Hardware).

E. Templates: Upon receipt of the approved security hardware schedule, the DEC shall

promptly provide the security hardware templates to the security hollow metal manufacturer, the CM/CM/GC, the Consultant, the ESS, or others requiring said information, for those entities' use in designing and installing their equipment and systems. The DEC shall extensively check the templates and shall certify their accuracy.

F. Product Data: Submit manufacturer's printed technical product data and catalog sheets indicating product characteristics, performance and limiting criteria.

G. Fire Labels: The DEC shall review the fire rated openings within the scope of this contract and identify any openings that cannot be fire labeled and the reasons why they cannot. If the designer furnishes the name of an approved manufacturer who can supply the fire labeled openings in question, the DEC shall be required to furnish the openings with fire labels at no additional cost. However, if label openings are not available as designed, the designer shall either authorize the necessary changes in opening design, hardware, glass or other features which will bring the openings into compliance or drop the fire labeling requirement on openings in question. Manufacturing the openings "Label Construction" without factory applied fire labels shall not be acceptable unless requested by the Consultant in writing.

H. Samples: Upon request of the Architect or Consultant, provide samples of any item specified herein for final approval/review. In each case where the sample is requested, the sample shall accurately reflect the item to be used in the project in every way and shall be of sufficient size and quality to allow judgment to be made as to its compliance with the requirements herein and the intent of the security design criteria.

1.5 COORDINATION

A. Coordinate detention work to ensure efficient and orderly installation of each part of detention work. Coordinate detention work that depends on each other for proper installation, connection, and operation.

1. Develop special procedures required for coordination of detention work.
2. Coordinate installation of different detention components to ensure maximum accessibility for required maintenance, service, and repair.
3. Coordinate provisions to accommodate detention work scheduled for later installation.

B. Coordinate final selection of detention products for compatibility.

C. Coordinate sequencing and scheduling of detention work. Prepare a sub-Schedule to Contractor's Construction Schedule for detention work. Base sub-Schedule on Preliminary Construction Schedule. Secure time commitments for performing critical construction activities from separate entities responsible for detention work.

1. Schedule construction operations in sequence required to obtain best results where installation of one part of detention work depends on installation of other components, before or after its own installation.
2. Coordinate sequence of detention work activities to accommodate tests and inspections.

D. Coordinate installation of anchorages and embedment for detention work. Obtain and distribute, to parties involved, setting drawings, templates, and

directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing detention work to comply with indicated requirements.

E. Coordinate type of security fasteners for detention work so no more than two different sets of tools are required to operate security fasteners for entire Project.

F. Coordinate temporary facilities and controls required by detention work.

G. Coordinate, schedule, and approve interruptions of existing utilities related to maintaining existing levels of security, including those necessary to make connections for temporary services.

1. Provide information necessary to adjust, move, or relocate existing detention utility structures affected by detention work.
2. Locate connection points to existing detention utility systems.

H. Coordinate protection of detention work.

1. Coordinate all detention work with the work of the Security Electronics Integrator. Review SE documents and submittals and correspondence for its impact on the Detention Equipment work. Integrate information from this process with the DE work throughout the project.

1.6 PROCEDURES

A. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of detention work. Such administrative activities include, but are not limited to, the following:
1. Preparation of detention work sub-schedule for Contractor's Construction Schedule.
2. Installation and removal of temporary facilities and controls for detention work.
3. Delivery and processing of detention work submittals.
4. Pre-installation conferences for detention work.
5. Project closeout activities for detention work.

B. Notifications: Prepare memoranda for distribution to each party involved with detention work, outlining special procedures required for coordination of detention work. Include such items as required notices, reports, and attendance at meetings.

C. Coordination Meetings: Conduct coordination meetings specifically for detention work at regular intervals. Coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings, submittal reviews and pre-installation conferences.
1. Attendees: In addition to representatives of Owner, Associate, Prime Contractors and Contractor, each subcontractor, supplier, and other entity concerned with progress or involved in planning, coordination, or performance of future detention work activities shall be represented at these meetings. All participants at conference shall be familiar with Project and authorized to conclude matters relating to detention

work.

2. Agenda: Review and correct or approve minutes of previous detention work coordination meeting. Review other items of significance that could affect progress of detention work. Include topics for discussion as appropriate to status of Project.
   a. Contractor's Construction Detention Work Sub-schedule: Review progress since last detention work coordination meeting. Determine whether each schedule item is on time, ahead of schedule, or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
   b. Schedule Updating: Revise Contractor's Construction Detention Work Subschedule after each detention work coordination meeting where revisions to schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
   c. Review present and future needs of each entity present, including the following:

1.7 PRODUCT HANDLING AND STORAGE

A. This Section shall comply with all requirements of Division 1 of the documents, the individual product specifications, as well as the CM/GC scope summary.

B. Deliver all components boxed or crated to provide protection during transit and job storage. Follow all manufacturers' recommendations regarding packaging and shipping. Comply with all specific requirements listed within each Product section of this specification.

C. Inspect all components upon delivery for damage. Minor damages may be repaired, provided the finish items are equal in all respects to new work and acceptable to the Consultant. Otherwise, remove and replace damaged items as directed.

D. Store all components at the building site under cover. The DEC shall provide locked storage for all components deemed necessary by the Consultant. Do not store any materials directly on the ground or concrete. Provide adequate ventilation and protection to ensure materials are kept dry, clean, and secure. Store all materials in the manner and order as prescribed by the manufacturer and in accordance with Division 1 requirements of the Specifications.

E. Packing and Marking: Each piece of security hardware, locks, accessories, security glass and other finished items furnished under this Section shall be packaged and clearly marked showing the contents and quantity. Locks and hardware shall be marked according to the hardware set and/or door numbers on the approved hardware schedule. Detention HM frames shall be permanently marked with the opening number for final placement

F. Damaged items: Inspect all components upon delivery for damage. Minor damages may be repaired, provided the finish work is equal in every way to new, undamaged items. Do not install damaged items in the work without written permission from the Consultant. The DEC shall immediately remove damaged items from the job site and shall expedite replacement.

1.8 PROJECT CLOSEOUT

A. General: Provide Operations / Maintenance manuals and other project close-out materials in accordance with procedures outlined

B. All project close-out materials shall be neatly organized, indexed, and placed in sets of 3-ring binders or other agreed-upon. Each Binder shall be clearly labeled on the cover and the spine to identify its contents. DEC shall provide both hard copies in the quantities called for in Division 1, but in no case shall that quantity be less than three complete sets. DEC shall provide one (1) CD ROM copy of all required materials in addition the hard copies required. Files on CD shall be organized the same as the hard copy version and shall be written in the latest versions of Word, Excel, Access software. Drawing files shall be included, and shall be written in latest version of AutoCad.

C. Provide the following:

1. Operations manual (s) for all components and any system as a whole.
2. Maintenance manual (s) for all components and system as a whole.
3. List of spare parts, materials and suppliers of components. Provide name, address telephone number and appropriate contact person for each supplier.
4. Emergency instructions for operational and maintenance requirements.
5. Copies of all warranties.
6. Delivery time frame for replacement of component parts from suppliers.
7. Recommended inspection schedule and procedures for all components and system as a whole.
8. Complete "Approved" shop drawings and product data for all components and system as a whole.
9. Eight (8) copies of O & M manuals required. Coordinate final distribution with GC and Owner.
10. Spare parts as required in each product section.

1.9 PROJECT SHAKEDOWN

A. The DEC shall coordinate with the CM/GC and the Owner to establish a shakedown period for the security systems. Shakedown period shall be a minimum of 30 days and shall be completed prior to substantial completion.

B. Prior to initiation of shakedown period, all work related to and supporting the security systems shall be complete. Such work shall include installation and operation of all locks and sliding door devices (emergency and daily operation). Coordinate shakedown period and hold in conjunction with shakedown period of Division 28 for Electronic Security Systems.

C. The DEC shall maintain a log of all anomalies, malfunctions, and repairs encountered during the shakedown period. The log shall be submitted to the Consultant for assessment at the conclusion of the shakedown period.

D. Training of Owner's staff may occur during the shakedown period.

1.10 RECORD DOCUMENTS

A. The Detention Equipment Contractor shall keep a complete set of all contract drawings, specifications, and the shop drawings /submittals in the job site office for use as Record Documents.

B. The DEC shall not use Record Documents for construction purposes. These documents shall be protected from deterioration and loss in a secure, fire-resistive location. The DEC shall provide access to Record Documents for the Consultant's reference during normal working hours.

C. As the work progresses, the DEC shall update the Record Documents to reflect changes in the work covered by this section. Note the following:

1. Use these sets of drawings for showing as constructed installation of security systems and equipment. Where shop drawings are used for mark-up, record a cross-reference at the corresponding location on the working drawings. Give particular attention to concealed work that would be difficult to measure and record at a later date.

2. Where any material, equipment, wiring or system components are installed differently from that shown, show such differences clearly and neatly using ink or indelible pencil.

3. Note related change-order and addendum number on all sheets where applicable.

4. Organize Record Drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on cover of each set.

D. Record Specifications: Maintain one complete copy of the Project Manual, including Addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in the actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on Work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related Record Drawing information and product data, where applicable.

E. At project completion, submit the record set of contract drawings to the Consultant (see Division 1).

F. At project completion, make corrections to the shop drawings on the original media and submit the corrected Mylar reproducible drawings to the Consultant (see Division 1). Where the shop drawings were created on a computer aided drafting system, furnish AutoCAD-compatible electronic drawing files of all corrected shop drawings.

## 1.11 WARRANTIES

A. This Section shall comply with Division 1, as well as specified herein.

B. DEC warrants all materials furnished by the DEC under this Section to be free from defects in material and workmanship for a minimum of two (2) years after Substantial Completion of the project. Should the CM/GC serve written notice on the DEC during the warranty period of such defect, (for the convenience of the Construction Manager, the DEC will accept such written notice directly from the Owner,) the DEC shall make good the defect at its own expense.

C. Glass breakage other than breakage caused by the DEC personnel is excluded.

D. The DEC agrees to maintain full time employees trained in and devoted to the maintenance and repair of this equipment during the entire warranty period.

E. The DEC will also provide any extended warranties that may be required by this specification under a particular product section.

1.12 TRAINING

A. The DEC shall, without additional cost of the Owner, provide a representative specially trained in operation of security equipment and systems with a thorough knowledge of its mechanisms, for a five continuous work day instruction and training period. The representative must be capable of training the owner's personnel in operation, repair, and upkeep. The DEC shall provide a minimum of 40 hours of training.

B. DEC shall video key operational and maintenance instruction sessions, performed on site with the Owner's personnel. The video shall be turned over to the Owner with the project closeout documents.

C. The video shall be saved on a standard DVD, removable disk or hard drive, describing operational sequences and instructions for proper use and maintenance of hardware, locking devices, control and monitoring systems and panels. The material content shall be in simple layman's terminology, step-by-step physical operations necessary for proper operation and necessary equipment adjustments, thereby assuring the Owner's ability to provide for a continuing source for training of new custodians, and optimum performance of the equipment.

D. The video shall be segmented and properly identified according to the content. As a minimum, the following shall be provided:

1. Operational Instructions: Locks and locking devices.
2. Maintenance and Equipment Adjustments:
   a. Locks, locking devices, closers, door position switches, and similar items.
   b. Glass replacement and maintenance.
   c. Furniture and accessories.
   d. Protective padding system.
   e. All others items and systems provided under this contract.

F. The DEC shall coordinate the training period to coincide and/or complement the training period provided by the ESS and the training schedule of the Owner.

1. Detention work interface requirements.
2. Sequence of detention work operations.
3. Status of detention work submittals.
4. Access to detention work.
5. Temporary facilities and controls required by detention work.
6. Quality and work standards of detention work.
7. Change Orders for detention work.

   a. Reporting: Record meeting results and distribute copies to everyone in attendance and

to others affected by decisions or actions resulting from each meeting.

b. The DEC shall provide 3 full sets of the Edited and organized training videos to the Owner.

## PART 2- EXECUTION

### 2.1 EXAMINATION

A. Prior to installation of work covered under this section, examine and inspect surfaces, anchors, and grounds that are to receive materials, fixtures, assemblies, and equipment specified. Check location, "rough in", and field dimensions prior to beginning work. Report unsatisfactory conditions in writing to the Architect and CM/GC. Begin installation only after unsatisfactory conditions have been corrected.

B. Verify all field dimensions and be responsible for their correctness. No extra compensation will be allowed for differences between actual field measurements and dimensions indicated on the drawings.

C. Inspect built-in and cast-in anchor installations before installing detention work to verify that anchor installations comply with requirements. Prepare inspection reports.

1. Where inspections indicate that anchors do not comply with specified requirements, re-inspect after repairs or replacements are made.
2. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.

D. Verify locations of detention work with those indicated on Coordination Drawings.

E. Comply with all installation requirements listed in individual specification sections under this contract.

### 2.2 FIELD QUALITY CONTROL

A. Install all fixtures, materials, assemblies, and equipment as specified herein and as indicated in the contract documents, and in strict compliance with manufacturer's recommendations and instructions.

B. All devices shall be mounted tight to ceiling, walls, etc., capable of supporting reasonable load.

C. Provide for anchorage of the type(s) shown, coordinated with the supporting structure. Fabricate and space anchoring devices to provide adequate support for the intended use of the work. Where anchor types are not specified and/or conflict with field conditions, inform the Architect and CM/GC to obtain approval of alternate anchoring system(s).

D. Install all components and complete system as indicated and in accordance with manufacturer's recommendation and instructions.

E. Set all work accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After surrounding construction is complete, remove temporary braces and spreaders leaving surfaces smooth and undamaged.

F. Pre-assemble items in the shop to the greatest extent possible, so as to minimize field splicing and assembly of units at the project site. Disassemble units only to the extent necessary for shipping and handling limitations. Clearly mark units for re-assembly and coordinated installation.

G. Nuts of all bolted work shall be drawn tight and threads battered, and/or field welded. Bolting may be used in the fabrication and installation of detention equipment provided that the nuts are not accessible to inmates or exposed to view. Bolts shall be special; oval head or flat head security type. Other types of bolts are unacceptable unless specifically approved by the Architect.

H. All Exposed fasteners shall be Approved Security Fasteners as specified in Section 05 05 10 of this specification.

I. Observe installation and startup checks of detention work according to manufacturer's written instructions.

J. Inspect installed detention work to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.

1. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
2. Prepare field quality-control certification that states installed detention work and its installation comply with requirements in the Contract Documents.

K. Testing: After installing electrified detention work and after electrical circuitry has been energized, test detention work for compliance with requirements.
1. When testing reveals detention work not in compliance with requirements, perform additional random testing to determine extent of noncompliance.
2. Where test results indicate that detention work does not comply with specified requirements, retest after repairs or replacements are made.
3. Perform additional testing and inspecting, at Contractor's expense, to determine compliance of replaced or additional work.

END OF SECTION 11 19 00

# SECTION 11 19 20 – SECURITY LOCKS AND HARDWARE

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, as well as Section 11 19 00, DETENTION EQUIPMENT apply to this Section.

B. See Detention Door Schedule in Section 11 19 40.

C. See Sht A0.30 for Door and Frame types.

D. Detention Hardware and Security Hardware are interchangeable terms. Reference to either DH or SH in the documents shall reference material specified under this section.

### 1.2 SUMMARY

A. General
1. This section consists of providing the Detention locks and hardware required to complete the building.
2. The specification together with the drawings and schedules cover the required units.
3. Security hardware shall be provided for any units not included in the specification, but required per drawings and/or schedules. Hardware furnished shall be of character, serviceability, quality and finish consistent with that specified for similar or same use.
4. All detention hardware shall be provided per this specification section except as noted elsewhere in the construction documents.

B. Work includes, but is not limited to: The work to be performed consists of furnishing the security hardware and specific finish hardware as shown on the drawings and described in these specifications, including but not limited to the following:
1. All detention locks, keys, and other security hardware and accessories for all detention doors.
2. Supply at the jobsite for installation by others: All imbedded metal items such as anchor bolts and anchoring.
3. All finish hardware indicated in this section.

C. Related work specified elsewhere includes, but is not limited to:

1. Section 04 20 00 Unit Masonry
2. Section 05 09 60 Security Fasteners
3. Section 09 90 00 Painting and Staining
4. Section 11 19 00 Detention Equipment - General
5. Section 11 19 10 Detention Hollow Metal
6. Section 11 19 40 Detention Schedules
7. Section 11 19 50 Security Glass and Glazing
8. Section 11 19 60 Detention Furniture and Accessories

1.3 PERFORMANCE REQUIREMENTS

A. Swinging Detention Door Assemblies: Provide detention door hardware as part of a detention door assembly that complies with security grade indicated, when tested according to ASTM F 1450, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project.

1.4 QUALITY ASSURANCE

A. In addition to the requirements of these specifications, comply with manufacturer's instructions and recommendations for all phases of work.

B. The Manufacturer of this work shall have been in business for the last ten (10) years and have provided security hardware on at least three (3) projects of comparable size during those ten (10) years. He shall have in his employ personnel with adequate prison hardware experience to qualify as an expert in this field. The material to be furnished shall be made by a manufacturer who specializes in security hardware.

C. Furnish a complete system to properly function as specified. Wiring diagrams for locks – DPS furnished.

D. Detention Hardware Manufacturer and Contractor shall guarantee the material provided by them and the workmanship performed by them on this project for two years from the date of Substantial Completion. Security Hardware Contractor shall repair or replace, within 48 hours, any defective work performed by them when given written notice during the warranty period. This obligation is limited to the replacement or repair. Security Hardware Supplier agrees to pass on all guarantees provided by their suppliers. Vandalism or excessive abuse is excluded from this warranty.

E. One security hardware manufacturer and one contractor shall provide the security hardware required for this work as indicated on the hardware sets.

F. Security hardware shall conform to the requirements of government authorities having jurisdiction except as dictated by more stringent project requirements.
   1. Standards
      a. A.I.A. (NBFU) Pamphlet No. 80
      b. Federal Specifications FF-H-00106, FF-H-00111, FF-H-121, and FF-H-0016.
      c. NBHA "Recommended Locations for Builders Hardware"
      d. ANSI/BHMA Standards A 156 Series, latest edition
      e. Americans with Disabilities Act (ADA) Accessibility guidelines for Buildings and Facilities/Federal Register Vol. 56, No. 144/July 26, 1991 - Closers and Lever Handles and Locksets.
      f. All hardware shall conform to OBBC.
   2. Fire-rated Openings
      a. Provide hardware for fire-rated openings in compliance with NFPA standards.
      b. Provide only hardware which has been tested and listed by UL for the types and sizes of doors required.
      c. Provide label where required.

1.5 SUBMITTALS

A. Product Data: Submit Manufacturer's technical product data for each item of finish hardware. Show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finish.

B. Samples
1. Submit one actual unit of each piece of finish hardware, tagged with full description for coordination with the Schedule. If Samples conform to the Contract Documents, they will be returned for inclusion in the Project.
2. Submit Samples of each metal finish, on an actual piece of the metal specified.

C. Shop Drawings
1. Submit Shop Drawings showing quality, type, and location of security hardware.
a. Wiring Diagrams: Detail power, signal, and control wiring and differentiate between manufacturer-installed and field-installed wiring for electrified detention door hardware. Include the following:
1) System schematic.
2) Point-to-point wiring diagram, including location of connections.
3) Riser diagram.
4) Elevation of each detention door.
2. Provide template to door/frame manufacturer after contract and hardware schedule are complete and acceptable.

D. Hardware Schedule
1. Contractor shall prepare and submit a working schedule of finish hardware for Associate's review. This schedule shall list all items of finish hardware that are to be furnished. The format of the finish hardware schedule shall be "vertical type". Group all items of finish hardware so as to correspond to their areas of use and be readily identifiable.
2. Show required hardware and accessories for each door using door numbers indicated on Drawings.
3. List all other items required and the location in the building.
4. Establish degree of opening for doors with overhead holder, closer, etc.; include on hardware schedule.
5. The schedule shall be checked and approved by the Contractor prior to submittal to Associate.

E. Operation/Maintenance Manuals
1. Operation Manual covering parts, maintenance, and operation. Refer to Division 1 for submittal procedure.

F. Product Certificates: For each type of electrified detention door hardware, signed by product manufacturer.
1. Certify that detention door hardware approved for use on types and sizes of labeled fire doors complies with listed fire door assemblies.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Tag each item or package separately, with identification related to the Hardware Schedule, and include installation instructions. Deliver individually packaged hardware items at the proper times to the Shop or Project Site for installation.

B. Delivery of Materials
1. Furnish finish hardware in such quantities and at such times so as not to delay the progress of the building. Label or tag finish hardware for its intended use in such a manner that application will be easily understood. Label with set numbers according to the approved hardware schedule.

C. Assembling of Materials
1. Prime Contractor shall arrange open shelving for assembling finish hardware before application so that it can be checked, and to enable all parties concerned to investigate discrepancies pertaining to quality and character. Keep finish hardware in a locked, dry, room until ready for final application. Prime Contractor shall control this space and shall be responsible for protection of hardware after receiving it on the job.

D. Lock Cylinders and Keying
1. Control and limit use of keys. Turn keys over to Owner at date of Substantial Completion, or when directed.

1.7 JOB CONDITIONS

A. Field Service
1. The hardware supplier shall assign a competent representative to be at the job site each time a major shipment of security hardware is received. Such representatives shall assist in "checking in" these shipments and shall secure a receipt covering the contents of each shipment. In addition, such representative shall be available for immediate call to the job site when, in the opinion of the Associate, his presence is necessary.
2. Supplier shall provide 3 separate site visits by a competent manufacturer’s representative for keying meeting(s) and project coordination.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of detention door hardware.

B. Tool Kit: Provide six sets of tools for use with security fasteners, each packaged in a compartmented kit configured for easy handling and storage.

1.9 SPARE PARTS

A. Provide the following Spare parts for Owner’s Attic Stock:
1. One (1) Lock assembly for each type/hand provided on the project.
2. Two (2) Cylinders for each type provided
3. Two (2) Closer / Dps units of each type provided

4. Four (4) sets of limit switches for each type provided on the project.
5. One (1) each of all miscellaneous hardware items provide to include, pulls, thresholds, strikes, Weatherstripping, covers/escutcheons, and Lever sets, etc.

B. Packaging and Delivery:
1. All items for Attic Stock shall be neatly packaged for long-term storage.
2. All packages shall be clearly and permanently labeled.
   a. Contents name and part number(s)
   b. Manufacturer Name, address and telephone
   c. Date of delivery to Owner
   d. Packaging shall include written information on replacement instructions
3. DEC shall prepare a shipping transmittal for Spare parts in this section and shall obtain a receipt from the Owner for these items. DEC shall provide copies of these documents within the Maintenance Manuals and shall provide copies to the CM/GC, The Owner, and the Architect.

## PART 2 - PRODUCTS

### 2.1 DETENTION HARDWARE

A. Manufacturer: Except as otherwise specified, the equipment and materials of this Section shall be products of the listed here-in: Other manufacturers seeking approval shall do so in writing per the requirements of this section and shall list exact catalog numbers and description of the items proposed to furnish.

| | |
|---|---|
| 1. Hinges: | Brookfield, FA, , SSCo, and Stanley. |
| 2. Push, | Pulls: NS, FA, Brink, and SSCo. |
| 3. Closers: | LCN, Norton. |
| 4. Closers/DPS: | LCN, . |
| 5. Door Position Switch: | NS, FA, Brink, SSCo, , Airteq. |
| 6. Monitoring Switches: | NS, FA, Brink, SSCo, and Airteq. |
| 7. Thresholds: | Reese, Pemko. |
| 8. Weather-strip: | Reese, Pemko. |
| 9. Smoke Gasket: | Reese, Pemko. |
| 10. Silencers: | GJ, Ives. |
| 11. Doorstops: | Stanley, GJ, Ives, Airteq. |

B. DESIGNATIONS: Following abbreviations identify listed manufacturers:

| | |
|---|---|
| 1. Brookfield | Brookfield Industries, Inc., Thomaston, CT |
| 2. Brink | R.R. Brink, Shurwood, IL |
| 3. FA | Folger Adam Co.; Lemont, IL |
| 4. GJ | Glynn-Johnson Corp.; Chicago, IL |
| 5. Hiawatha | Metalcraft, Inc.; Minneapolis, MN |
| 6. Ives | H. B. Ives Div.; New Haven, CT |
| 7. LCN | LCN Closers; Princeton, IL |
| 8. Norton | Norton Closer Div.; Charlotte, NC |
| 9. Pemko | Pemko Mfg. Co.; Emeryville, CA |
| 10. Reese | Reese Enterprises; Rosemount, MN |
| 11. Stanley | Stanley Hardware, |
| 12. SSCo | Southern Steel Co.; San Antonio, TX |

C. FINISHES:

1. All hardware shall be US26D or US32D finish unless otherwise specified here-in. This requirement applies to all exposed hardware, including strikes, coverplates, switch covers, cylinders, etc which are exposed when the door is open as well as when closed.

2. Provide hardware in the finish(es) listed. Notify Architect immediately if scheduled hardware is not available in selected finsh(es).

D. HARDWARE (use where scheduled):

1. Stainless Steel Institutional Hinge (examples- NS 4.5 FMWS; SSCo 204 MSS): Butts to be full-mortise unit, 4-1/2" x 4-1/2" x hospital tip x 0.180 minimum thickness. Pins shall be hardened, stainless steel, free to rotate in the barrel, concealed and non-removable. The knuckles shall be welded, the leafs shall be provided with a ½" diameter prison stud. Each butt shall be supplied with eight ¼-20 flat head security fastener. Screw holes in each leaf shall be countersunk All hinges to be stainless steel.
2. Electric Transfer Hinge (examples- NS 4.5 EFM; SSCo 204 E): Butts to be full-mortise unit, 4-1/2" x 4-1/2" x hospital tip x 0.180 minimum thickness. Pins shall be hardened, stainless steel, free to rotate in the barrel, concealed and non-removable. The knuckles shall be welded, the leafs shall be provided with a ½" diameter prison stud. Each butt shall be supplied with eight ¼-20 flat head security fasteners. Screw holes in each leaf shall be countersunk All hinges to be investment - cast brass with US26D finish.
3. Access Door Hinge (examples- NS-603; SSCO 203FS; FA #2): Butt to be 3" x 4" with 0.210" minimum leaf thickness, fabricated from bonderized steel and prime painted. Hinge barrels shall be solid and no pin line shall be visible. When door is closed the hinge presents a curved surface with no sharp angle pieces exposed. Pin is fully welded. Each butt shall be supplied with four ¼ 20 flat head security fasteners. Screw holes in each leaf shall be countersunk. Finish shall be USP.
4. Food Pass Hinge (examples- NS-603FP; SSCO 203FP; FA #3FP): Butt to be 3" x 4" with .210" minimum leaf thickness, fabricated from bonderized steel and prime painted. Butts are provided with an applied stop capable of restricting the hinge from rotating more than 90 degrees, thus becoming a bracket and causing the food pass door to act as a shelf. Pin is fully welded. Each butt shall be countersunk and provided with four ¼-20 flat head security fasteners. Finish shall be USP.

5. Raised Door Pull (examples- NS-602; SSCo212S; FA #2): Pull shall be cast of brass, bronze or stainless steel. Overall length, 8-3/4"; hand hold, 5-1/4"; grip clearance, 1-1/2"; attachment holes, 7-3/4" O.C. Provide two 3/8-16 x 5/8" oval head security fasteners. Provide clear lacquer finish baked for 15 min. at 350 degrees and allow cooling before packaging. Integral finish shall be US26D or US32D.

6. Flush Door Pull (examples- NS-604; SSCo214C; FA #4): Pull shall be cast of brass, bronze or stainless steel. Size, 4" x 5" x 1/8" x pocket grip 1" deep. Provide four ¼-20 x 5/16" oval head security fasteners. Provide 4553D clear lacquer finish, baked for 15 minutes at 350 degrees and allow cooling before packaging. Integral finish shall be US26D or US32D.

7. Magnetic Reed Door Position Switch (examples- NS6200; SSCo 200MRS): The position sensor shall be a magnet mortised type assembly used for remotely monitoring the door status/position. The device shall be moisture resistant and fit within 2" hollow metal doorjamb. The device shall be field adjustable on two axis and supplied with a 3' vinyl jacketed lead wire and a 3 pin Molex connector. The device shall be steel construction. The switch and magnet shall be encased in epoxy resin. The overall dimension shall be 1-1/4" x 4 7/8" x 1". Provide four ¼-20 flat head security fasteners for each piece.

8. Surface mounted Door Position Switch (examples- SSCo 220 and 220S dps) The door position switch shall be enclosed in a 10GA steel housing. The unit shall mount to the head of the door frame and shall include a pivoting operator that mounts to the top of the door face. Provide the 220S for frames with 2" heads, and 220 for frames with 4" heads. Provide with all necessary mounting plates and security fasteners. Finish of housing shall be USP.

9. Lock Keeper Monitoring Switch (by Lock manufacturer): The Lock keeper switch shall be enclosed in a 10GA steel housing. The lock keeper switch shall be provided by the lock manufacturer. The lock keeper switch shall be designed specifically for the lock in the opening in which it is used. Provide with all necessary mounting plates and security fasteners. Finish of recessed housing shall be USP. Finish of strike plate shall be US32D.

10. Mortised High Security Closer/Door Position Switch (examples- LCN #2210/dps AVB): Doors as detailed shall be controlled by overhead-concealed closers that have been tested to 10,000,000 opening-closing cycles. Closers shall have full hydraulic rack and pinion action with high strength cast iron cylinder. Spring power shall be adjustable from size III through size V. Hydraulic fluid shall be of a type requiring no seasonal adjustment for temperatures ranging from 120 degrees F to -30 Degrees F. Separate tamper-proof screw valves shall provide independent regularization of latch speed, general speed, and hydraulic back check. Regulating screws shall be accessible through a heavy duty mounting plate when finish plates are removed. Closers shall have an integral electromechanical device rated not less than 24VAC at 10 amperes to detect and signal rotation of the closer pinion. This device shall be field adjustable to allow setting for each door and fitting with a protective shield. Installation of the finish plate shall conceal adjustment mechanisms. Closer shall have an extra heavy duty forged steel concealed arm. The low friction track roller shall be attached to the arm by a threaded mounting. Closers shall have a metal track designed to prevent jamming and to eject foreign objects placed in the track mortised into the top of the door. Provide with all necessary mounting plates, covers and security fasteners. Finish of all exposed parts shall be US32D.All closers shall include advanced variable backcheck (AVB) feature.

11. Surface mounted High Security Closer (examples- LCN #4510-AVB): Doors as detailed shall be controlled by surface mounted closers that have been tested to 10,000,000 opening-closing cycles. Closers shall have full hydraulic rack and pinion action with high strength cast iron cylinder. Spring power shall be adjustable from size III through size V. Hydraulic fluid shall be of a type requiring no seasonal adjustment for temperatures ranging from 120 degrees F to -30 Degrees F. Separate tamper-proof screw valves shall provide independent regularization of latch speed, general speed, and hydraulic back check. Regulating screws shall be accessible through a heavy duty mounting plate when finish plates are removed. Installation of the finish plate shall conceal adjustment mechanisms. Closer shall have an extra heavy duty forged steel parallel arm. The low friction track roller shall be attached to the arm by a threaded mounting. Closers shall have a metal track designed to prevent jamming and to eject foreign objects placed in the track mounted onto the top of the door. Provide with all necessary mounting plates, covers and security fasteners. Finish of all exposed parts shall be US32D.All closers shall include advanced variable back-check (AVB) feature.

12. Aluminum Threshold (examples - Pemko 2005AS): Provide aluminum thresholds in the appropriate sizes shown in the Detention Door and/or Security Hardware Schedule. Provide all accessories and security fasteners required to provide complete, weatherproof installation. Finish shall be clear anodized aluminum.

13. Pass-proof Threshold (examples - Pemko 121A with 66A hook) : Provide aluminum pass-proof thresholds in the appropriate sizes shown in the Detention Door and/or Security Hardware Schedule. Provide all accessories and security fasteners required to provide complete, secure installation. Finish shall be clear anodized aluminum.

14. Weather-stripping / Smoke Gasket (examples Pemko S88AS): Provide continuous silicone smoke gasket / weather-stripping assembly as scheduled within the Detention Door and/or Security Hardware Schedule. Provide all accessories and security fasteners required to provide complete, weatherproof installation.

15. Detention Doorstops (examples Stanley: 3001 /3002) Provide wall or floor versions of Detention Doorstop for ALL swinging doors. Stop unit to be constructed of heavy neoprene rubber with 90 durometer hardness. Unit shall have 5/8" dia x 2 /1/2" long integral mounting post for floor installation and approved security fastener for wall installation. Floor Unit shall be approximately 2” dia x 2 ½” high. Wall Unit shall be approximately 2" dia. X 1 ¼" high. Note: Final determination of wall vs. floor type installation shall be made at the time of installation to fit each individual condition.

E. Special SECURITY HARDWARE SETS

NOTE: Standard Security Hardware sets are scheduled within the DETENTION DOOR SCHEDULE and in Part 4 of this section.

The following Special Security Hardware Sets are also required as follows:

**Set 80 a: ( Special - Food Passes)**

1 lock SSCo 1010M - 1 (w/keeper)
1 hinge Heavy-Duty piano hinge

Note: provide wherever Food Passes are scheduled. Provide to DHM manufacturer. Add to DEC hardware schedule. Include these locks in the Detention Keying Schedule

**Set 80 b: ( Special - Cuff Passes)**

1 lock SSCo 1010M - 1 (w/keeper)
1 hinge Heavy-Duty piano hinge

Note: provide wherever Cuff Passes are scheduled. Provide to DHM manufacturer. Add to DEC hardware schedule. Include these locks in the Detention Keying Schedule

**Set 80c: ( Special – Lockable Paper Passes)**

1 lock SSCo 1017M - 1 (w/keeper)
1 hinge Heavy-Duty piano hinge

Note: provide wherever Lockable Paper Passes are scheduled. Provide to DHM manufacturer. Add to DEC hardware schedule. Include these locks in the Detention Keying Schedule

**Set 81: ( Special – Security Access Panels)**

1 lock SSCo 1017M - 1 (w/keeper)
1 hinge Heavy-Duty piano hinge

Note: provide wherever Security Access Panels are scheduled. Provide to Panel manufacturer. Add to DEC hardware schedule. Include these locks in the Detention Keying Schedule

**Set 82: ( Special - Roof Hatches)**

NOT USED

**Set 83: ( Special – Fire Cabinets)**

1 lock SSCo 1017M - w/housing and keeper switch
2 hinges By cabinet mfr.

Note: provide to cabinet manufacturer. Add to DEC hardware schedule.
Include these locks in the Detention Keying Schedule

-End of Special Hardware Sets-

F. CYLINDERS, KEYS AND KEYING:

A. SPECIAL CONDITION: The Security Hardware Supplier shall furnish only ASSA cylinders and Keys on this project for all "builder's –type" and mogul cylinders. The Owner has a licensed ASSA key-way exclusively assigned to Snohomish County. The hardware supplier will be required to purchase the cylinders under this agreement. (paracentric keyways will be provided as part of the locks affected).

1. Keying: The security locks will incorporate three (3) separate keying systems; one for lever tumbler (Paracentric), one for pin tumbler (mogul cylinder) and one for commercial (builder cylinder) locks. Each keying system's keys shall be dye stamped for identification; corresponding to the hardware supplier's final keying schedule.
2. Lever tumbler locks shall be keyed alike or different as directed. Provide cut keys as required. Paracentric prison locks shall be keyed in sets as coordinated with Owner, and provided with five keys for each set.
3. Builders cylinders and mogul type cylinders shall be keyed in sets and master keyed, grand master keyed, and similar items. to level as coordinated with Owner. Provide five keys per key change and five keys per master level.
4. Key Schedule: The DEC will prepare a proposed keying schedule for the security locks, showing their recommendations for the system layout. (See 1.03; Submittals, this section). The DEC will provide copies of the keying schedule sorted by both door number and key change. The DEC shall provide Keying Plans, consisting of floor plans showing the location of each key code. The DEC shall coordinate the keying plans with the commercial as required by the Architect.

a. The Architect and Owner will review the schedule and make desired modifications. The DEC, and Owner shall meet to finalize the keying of the project.

5. Cylinders:

General

a. Provide all cell doors with 1 cylinder each on hinge side unless otherwise noted in Detention Door Schedule.
b. Provide all other doors with cylinders on both sides unless otherwise noted in Detention Door Schedule.
c. Provide cylinders for all manual release functions for sliding locking devices as required by the device manufacturer.
d. Provide cylinders for all electric key-switches called for in the ES documents (see ES drawings and Division 13) unless combined with locks specified to have the 'LEK' type function.
e. All cylinders shall be US26D or US32D to match other hardware unless otherwise noted.

Commercial (Builders) cylinders

a. All builders cylinders provided under this contract shall be ASSA High Security Cylinders with 5C interchangeable cores.
b. Provide construction keys and cores during the construction period. Construction, control, and operating keys shall not be part of the Owner's permanent keying system.

Mogul cylinders

a. Provide all mogul cylinders by ASSA.

Paracentric key-ways

a. Provide all paracentric keyways by the same manufacturer as that of the locks requiring them.

2.2 DETENTION LOCKS (for swing doors)

1. Acceptable Manufacturers: Except as otherwise specified, the equipment and materials of this Section shall be products of the following manufacturers:
    a. Electric Mechanical Locks: FA, Brink, SSCo,, and Airteq.
    b. Wide Jamb Electric Locks: FA, Brink, SSCo, and Airteq. .
    c. Narrow Jamb Electric Locks: FA, Brink, SSCo, , and Airteq.
    d. Mortise Locks: FA, Brink, SSCo, , and Airteq.
2. All locks shall be standard products of the approved manufacturers, specifically designed for use in detention and corrections facilities.
3. All Detention locks on the project shall be by a single, approved manufacturer.
4. All exterior locks and locks for shower doors and chase doors shall be galvanized.
5. All motorized locks shall be provided with both full cycle and ½ cycle functions unless specifically scheduled to have only one or the other.
6. All motorized locks shall be provided with “no latch-back” feature unless otherwise specified.
7. All emergency exit doors shall be provided with “EED” function and shall be 115VAC-solenoid type.
8. All locks shall be furnished complete with key-ways and cylinders specifically designed for use in the corrections environment as required by the Detention Door Schedule. The DEC shall provide all required roses, escutcheons, cylinder extensions, etc to provide complete installation.
9. All locks shall be provided complete with mounting plates, covers, housings and other accessories or options as are required for scheduled installation and to comply with good industry practices.
10. Install lock cover plates with approved security fasteners on "secure" side of door unless otherwise specified. Request clarification from Architect where cover location is in doubt.
11. Provide electric transfer hinge for electromechanical locks/devices mortised in doors. This electric transfer hinge shall be provided in addition to the hinges required by the hardware sets. The transfer hinge shall be mounted as the center hinge.
12. Provide lock keeper switch for mechanical locks where monitoring is required by Detention Door Schedule.

B. LOCK TYPES:

1. General:
    a. Lock descriptions below are general. Specific features may vary by opening. SEE DETENTION DOOR SCHEDULE in the SCHEDULE Manual.. The lock "types" (ie: A-2, B-1, etc.) are shown in a master list in the LOCK TYPE KEY with the Detention Door Schedule. The following locks are to be provided.
    b. The Security Hardware Sets are shown at the end of this section.
    c. The DEC shall immediately notify the Consultant of any conflicts between the Detention Door Schedule and these specifications.
2. LOCK TYPE D: Paracentric mechanical deadlock (examples; FA 80 series, SSCo #1080 series.):
    a. Lock case to be malleable iron with cold rolled steel cover. Latchbolt to be milled steel with hardened tool steel inserts unless otherwise specified.

b. Lock to operate by inserting paracentric key into matching polished alloy bronze cylinder and rotating key to align five or six spring temper hardened brass lever tumblers. Lever tumblers to be held in position by flat phosphor bronze springs.

c. Lock size to be approximately 5-1/2" x 1-1/2" x 3-3/4". Lockbolt to be used 3/4" x 2" milled steel with 3/4" throw. Deadbolt locking and unlocking activated by key only.

d. Lock to be mortised into door thickness.

3. LOCK TYPE F: Paracentric Mechanical Deadlatch (examples SSCo 1070; FA 70): or LOCK FK (examples SSCo 1070K; FA 70K):

a. Lock case to be malleable iron with cold rolled steel cover. Latchbolt to be milled steel with hardened tool steel inserts unless otherwise specified.

b. Lock to operate by inserting paracentric key into matching polished alloy bronze cylinder and rotating key to align five or six spring temper hardened brass lever tumblers. Lever tumblers to be held in position by flat phosphor bronze springs.

c. Lock size to be approximately 8-3/4" x 1-1/2" x 5". Beveled latchbolt to be 3/4" x 2 with 3/4" throw. Beveled latchbolt to be retracted by key operation only.

d. Lockbolt to spring lock on closing. Provide automatic deadlock actuator for deadlocking of latchbolt.

e. Lock to be mortised into door thickness.

4. LOCK TYPE VD: Paracentric Mechanical Deadlock (examples SSCo 1030D; FA 30) for sliding door:

a. Lock case to be malleable iron with cold rolled steel cover. Hookbolt to be milled steel with hardened tool steel inserts unless otherwise specified.

b. Lock to operate by inserting paracentric key into matching polished alloy bronze cylinder and rotating key to align five or six spring temper hardened brass lever tumblers. Lever tumblers to be held in position by flat phosphor bronze springs.

c. Lock size to be approximately 10" x 1-1/2" x 3 1/2". Hookbolt to be 1 1/2" high x 1/2" thick. hookbolt to be retracted by key operation only.

d. Lock to be mortised into door thickness.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Examine detention doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance of detention door hardware.
   1. Examine roughing-in for embedded and built-in anchors to verify actual locations of detention door hardware connections before detention door hardware installation.
   2. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of detention door hardware.

B. Inspect built-in and cast-in anchor installations before installing detention door hardware to verify that anchor installations comply with requirements. Prepare inspection reports.
   1. Remove and replace anchors where inspections indicate that they do not comply with specified requirements. Re-inspect after repairs or replacements are made.
   2. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.

C. Verify locations of detention door hardware with those indicated on Coordination Drawings.

D. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified detention door hardware installation.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

A. Examine doors, frames, and hardware for damage, defects, and suitability for intended use. Restore all parts or items found damaged, defective or inadequate, or replace with good material before installation.

### 3.3 INSTALLATION

A. Mounting Heights: Heights given are center line heights up from finish floor unless stated; heights given "Number to Number" indicates that all shall be at one height within limits given. Where heights of items are not listed, mount in accord with recommendations of DHI.
   1. Bottom Hinge: 10 to 13 inches
   2. Top Hinge: 6 to 8 inches down from hd.
   3. Intermediate Hinges: Equally spaced
   4. Door Knob: 36 to 40-5/16 inches
   5. Door Pull: 42 to 45 inches
   6. Deadlocks: 54 inches from floor to centerline

B. Fitting
   1. Fit all hardware accurately and properly. Remove exposed parts until after painters finishing is completed, then reinstall. Securely fasten all fixed parts. Fit faces of mortised parts snug and flush. Make sure operating parts move freely and smoothly without binding, sticking, or excessive clearance.

C. Adjusting and Finishing
   1. After work has been otherwise completed, examine all hardware for complete and proper installation. Lubricate bearing surfaces of moving parts. Adjust latching and holding devices to proper function. Adjust door control devices to proper speed and power. Test keys for conformance to approved keying system. Clean all exposed surfaces, check for surface damage and polish.

D. Thresholds
   1. Install in one continuous piece, full width of opening. Set in full bed of mastic and fasten with countersunk anchors at 6 inches on center.

3.4 DEFECTIVE WORK

A. Where hardware is found defective in materials or installation; rework, restore, replace, or otherwise correct as directed.

B. Following will be considered as defective materials:
   1. Unauthorized substitutes.
   2. Items delivered with missing, broken, damaged, or defaced parts.
   3. Items of incorrect hand or function.

C. Following will be considered as defective installation:
   1. Items broken, damaged, or defaced after delivery.
   2. Items incomplete, misaligned or incorrectly located.

D. All expenses incurred by the Architect or Owner in troubleshooting security hardware problems, caused by inadequate workmanship or other form of poor performance on the part of a contractor, shall be borne by that contractor.

## PART 4 - SECURITY HARDWARE SETS

4.1 HARDWARE SETS

A. Keying is as per "KEY SIDE" in Detention Door Schedule. Provide the quantity of Cylinders as required for the keying listed for each opening.

B. Locks are Scheduled Separate from the Hardware Sets. See "LOCK TYPE" in Door Schedules and as specified herein.

C. Provide Bi-directional cylinder with internal Key-switch function where Electric Key is scheduled.

D. Doorstops shall be wall or floor mounted at each location as conditions require.

E. Provide Sets as follows:

**SET: S20F**
Description: Interior – 2h/1p

| Item | Example | Description | Qty |
|---|---|---|---|
| Lock w Cylinder (s) | See Detention Door Schedule | | 1 |
| Hinges | SSCo - 204FM SS | | 2 |
| Pull - Recessed | SSCo - 214C | | 2 |
| Closer | | Required where fire rated | 1 |

Function: Manual operation. Access Panels. Cylinders as required by "Key Side" in Detention Door Schedule.

**SET: S21A**
Description: Interior – 3h/1p/cl-dp

| Item | Example | Description | Qty |
|---|---|---|---|
| Lock w Cylinder (s) | See Detention Door Schedule | | 1 |
| Hinges | SSCo - 204FM SS | | 3 |
| Pull - Raised | SSCo - 212C | | 1 |
| Doorstop | Stanley 3001 / 3002 | | 1 |

Function: Manual operation. Provide Cylinders as required by "Key Side" in Detention Door Schedule.

**SET: S21B**
Description: Interior – 3h/2p

| Item | Example | Description | Qty |
|---|---|---|---|
| Lock w Cylinder (s) | See Detention Door Schedule | | 1 |
| Hinges | SSCo - 204FM SS | | 3 |
| Pull - Raised | SSCo - 212C | | 2 |
| Pull - Recessed | SSCo - 214C | | 2 |
| Doorstop | Stanley 3001 / 3002 | | 1 |

Function: Manual operation. Provide Cylinders as required by “Key Side” in Detention Door Schedule.

**SET: S60B**

Description: Interior – Slide/2p/Man

| Item | Example | Description | Qty |
|---|---|---|---|
| Device | See Detention Door Schedule | | 1 |
| Pull - Raised | SSCo - 212C | | 1 |
| Pull - Recessed | SSCo - 214C | | 1 |

Function: Manual operation. Provide Cylinders as required by “Key Side” in Detention Door Schedule.

**END OF SECTION 11 19 20**

# SECTION 11 19 30 - DETENTION LOCKING DEVICES

## PART I-GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division I, as well as Section 11 19 00, DETENTION EQUIPMENT apply to this Section.

### 1.2 SUMMARY

A. General
1. This section consists of furnishing the electro-mechanical Locking Devices as shown
2. The specification together with the drawings and schedules cover the required units.

B. Work includes, but is not limited to: The work to be performed consists of furnishing the electro-mechanical Locking Devices as shown on the drawings and described in these specifications, including but not limited to the following:
1. All detention sliding door devices complete.
2. Supply at the jobsite for installation by others: All imbedded metal items such as anchor bolts and anchoring.
3. All finish hardware and accessories indicated in this section.

C. Related work specified elsewhere includes, but is not limited to:
1. Section 04 20 00 - Unit Masonry
2. Section 05 05 10 - Tamper-Proof Metal Fasteners
3. Section 09 90 00 - Painting and Staining
4. Section 08 71 00 - Door Hardware
5. Section 11 19 00 - Detention Equipment - General
6. Section 11 19 10 - Detention Hollow Metal
7. Section 11 19 20 - Security Locks and Hardware.
8. Section 11 19 40 - Detention Schedules
9. Section 11 19 50 - Security Glass and Glazing
10. Section 11 19 60 - Detention Furniture and Accessories
11. Section 11 19 70 - Security Metal Ceilings
12. Div. 28, Electronic Safety and Security

### 1.3 PERFORMANCE REQUIREMENTS

A. Sliding Detention Door Assemblies:
1. Provide detention devices as part of a detention door assembly that complies with security grade indicated, when tested according to ASTM F I450, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project.

### 1.4 QUALITY ASSURANCE

A. In addition to the requirements of these specifications, comply with manufacturer's instructions and recommendations for all phases of work.

B. The Manufacturer of this work shall have been in business for the last ten (10) years and have provided security hardware on at least three (3) projects of comparable size during

those ten (10) years. He shall have in his employ personnel with adequate prison hardware experience to qualify as an expert in this field. The material to be furnished shall be made by a manufacturer who specializes in security hardware.

C. Furnish a complete system to properly function as specified. Wiring diagrams for locks – DPS furnished.

D. Detention Device Manufacturer and Contractor shall guarantee the material provided by them and the workmanship performed by them on this project for two years from the date of Substantial Completion. Security Hardware Contractor shall repair or replace, within 48 hours, any defective work performed by them when given written notice during the warranty period. This obligation is limited to the replacement or repair. Security Hardware Supplier agrees to pass on all guarantees provided by their suppliers. Vandalism or excessive abuse is excluded from this warranty.

E. Devices shall conform to the requirements of government authorities having jurisdiction except as dictated by more stringent project requirements.

2. Standards
   a. A.I.A. (NBFU) Pamphlet No. 80
   b. Federal Specifications FF-H-00106, FF-H-00111, FF-H-121, and FF-H-0016.
   c. NBHA "Recommended Locations for Builders Hardware"
   d. ANSI/BHMA Standards A 156 Series, latest edition
   e. Americans with Disabilities Act (ADA) Accessibility guidelines for Buildings and Facilities/Federal Register Vol. 56, No. 144/July 26, 1991 - Closers and Lever Handles and Locksets.
   f. All hardware shall conform to OBBC.

3. Fire-rated Openings
   a. Provide hardware for fire-rated openings in compliance with NFPA standards.
   b. Provide only hardware which has been tested and listed by UL for the types and sizes of doors required.
   c. Provide label where required.

## 1.5 SUBMITTALS

A. Product Data:
1. Submit Manufacturer's technical product data for each item of finish hardware. Show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finish.

B. Samples

1. Submit one actual unit of each piece of finish hardware, tagged with full description for coordination with the Schedule. If Samples conform to the Contract Documents, they will be returned for inclusion in the Project.
2. Submit Samples of each metal finish, on an actual piece of the metal specified.

C. Shop Drawings

1. Submit Shop Drawings showing quality, type, and location of security hardware.
   a. Wiring Diagrams: Detail power, signal, and control wmng and differentiate

between manufacturer-installed and field-installed wiring for electrified detention door hardware. Include the following:

1) System schematic.
2) Point-to-point wiring diagram, including location of connections.
3) Riser diagram.
4) Elevation of each detention door.

2. Provide template to door/frame manufacturer after contract and hardware schedule are complete and acceptable.

3. Provide information to the DEC for Device Coordination Drawing submittal.

D. Operation/Maintenance Manuals

1. Operation Manual covering parts, maintenance, and operation. Refer to Division I for submittal procedure.

E. Product Certificates: For each type of electrified detention door hardware, signed by product manufacturer.

1. Certify that detention door hardware approved for use on types and sizes of labeled fire doors complies with listed fire door assemblies.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Tag each item or package separately, with identification related to the Hardware Schedule, and include installation instructions. Deliver individually packaged hardware items at the proper times to the Shop or Project Site for installation.

1.7 JOB CONDITIONS

A. Field Service

1. The Device supplier shall assign a competent representative to be at the job site each time a major shipment of security hardware is received. Such representatives shall assist in "checking in" these shipments and shall secure a receipt covering the contents of each shipment. In addition, such representative shall be available for immediate call to the job site when, in the opinion of the Associate, his presence is necessary.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of detention door hardware.

B. Tool Kit: Provide six sets of tools for use with security fasteners, each packaged in a compartmented kit configured for easy handling and storage.

PART 2- PRODUCTS

2.1 ELECTRO/MECHANICAL LOCKING DEVICES (for sliding doors)

A. Acceptable manufacturer: Except as otherwise noted, the equipment in this Section

shall be provided by one of the following manufacturers:
I. Southern I Folger Company.
2. Folger Adam.
3. RR Brink
4. Airteq

B. The equipment and materials of this Section are products of the Southern Steel Company (called SSCO below), unless otherwise noted.

C. THE LOCK TYPES REFERENCED ARE SCHEDULED IN THE DETENTION DOOR SCHEDULE. And listed in the LOCK TYPE KEY. The only Sliding Devices used on this project are LOCK TYPE Q I and Ul.

D. Device Type Pl: Fully Electric Sliding Cell Door Operator, SSCO #3150 Series (rack/pinion) and fully electric sliding cell door operator. This device shall employ an stationary motor with a pinon gear engaging with a rack gear attached to the door. Types P2 (Chaindrive) and P3 (pnuematic)- Not Used.

I. Features. The device shall have the following features:

a. Unlock, open and lock open a 2'-0" door in not more than five seconds.

b. Unlock, close and deadlock close a 2'-0" door in not more than five seconds.

c. Stop the movement of any door in mid-travel so that it may be manually opened or closed by applying approximately 35 lb. of pressure on the door.

Instantly reverse the direction of the door. In the even the door is blocked, the door shall automatically continue to the open or closed position when the obstruction is removed.

d. Normal force exerted by a door in travel is 40 lb. This force shall be field adjustable from
15 lb. to 110 lb. to accommodate various door conditions.

e. Device shall hold preset pressure on door at times of operation regardless of voltage.

f. The locking device shall be designed so that there are no projecting lugs on the receiver column or the door. Door shall automatically deadlock close at two points at rear of door. Front locking shall not be acceptable.

g. Where scheduled, each Device shall be equipped with an electric key-switch to allow the device to be operated from one or both sides electrically as indicated. The electric key- switch shall be located on the secure side of the device.

h. In the event of a power failure, each cell door shall have capabilities ofbeing unlocked with a paracentric key, from one or both sides of door as scheduled. Once unlocked, this action shall enable door to be moved manually to an open position.

2. Device Components:

a. Motors shall be 1/10 horsepower, single phase, 115 volt, 60 hertz, as manufactured by a nationally recognized manufacturer.

b. Door Hanger guides shall be min 114" thick steel plate. Door Hanger shall interlock with track support with a clearance of not more than 114".

c. Hanger support rollers shall be milled from solid steel 3-3/4" O.D. grooved 3/8" deep to engage 1/2" cold drawn track.

d. Rollers shall have anti-friction ball bearings with hardened members and grease shields on both sides.

e. Roller studs shall be high alloy steel with eccentric bushing for adjustment and an automatic self-locking nut.

f. Device shall Include rubber bumpers to cushion device movement at both open and closed position.

g. Paint assembly, except track, rollers and drive mechanism with rust inhibitive primer before shipment. Final painting by others.

h. Door guide shall be 7 gauge. Steel (min).

3. Housings and Covers:

a. The horizontal mechanism housing shall be constructed of 3116" mild steel plate. All openings thru the housing(s) shall be baffled.

b. Housing covers shall be constructed of 10 gauge sheet steel. All Housing covers shall be hinged with a continuous piano hinge; inaccessible when the cover is closed.

c. Housing covers shall be locked to the track box with button head security fasteners. d. The vertical lock bar housing and cover shall be constructed of 7 gauge sheet steel.

e. The vertical lock cover shall be removable only when the horizontal cover has been removed.

f. All Housings shall include all trim and fasteners to provide a complete and finished installation.

g. Where several Devices are grouped together, the housing covers shall be constructed to appear continuous; without gaps or holes between the housings.

E. Device Type Ql :Fully Electric Sliding Corridor Door Operator, SSCO #3165 Series (rack/pinion) and fully electric sliding cell door operator. This device shall employ an stationary motor with a pinon gear engaging with a rack gear attached to the door. Types Q2 (Chaindrive) and Q3 (pnuematic)- Not Used.

1. Features. The device shall have the following features:

a. Unlock, open and lock open a 2'-0" door in not more than five seconds.

b. Unlock, close and deadlock close a 2'-0" door in not more than five seconds.

c. Stop the movement of any door in mid-travel so that it may be manually opened or closed by applying approximately 35 lb. of pressure on the door.

d. Instantly reverse the direction of the door. In the even the door is blocked, the door shall automatically continue to the open or closed position when the obstruction is removed.

e. Normal force exerted by a door in travel is 40 lb. This force shall be field adjustable

from
15 lb. to 110 lb. to accommodate various door conditions.

f. Device shall hold preset pressure on door at times of operation regardless of voltage.

g. The locking device shall be designed so that there are no projecting lugs on the receiver column or the door. Door shall automatically deadlock close at two points at rear of door. Front locking shall not be acceptable.

h. Where scheduled, each Device shall be equipped with an electric key-switch to allow the device to be operated from one or both sides electrically as indicated. The electric key- switch shall be located on the secure side of the device.

i. In the event of a power failure, each cell door shall have capabilities of being unlocked with a paracentric key, from one or both sides of door as scheduled. Once unlocked, this action shall enable door to be moved manually to an open position.

4. Device
Components:

a. Motors shall be 1/10 horsepower, single phase, 115 volt, 60 hertz, as manufactured by a nationally recognized manufacturer.

b. Door Hanger guides shall be min 1/4" thick steel plate. Door Hanger shall interlock with track support with a clearance of not more than 1/4".

c. Hanger support rollers shall be milled from solid steel 3-3/4" O.D. grooved 3/8" deep to engage 1/2" cold drawn track.

d. Rollers shall have anti-friction ball bearings with hardened members and grease shields on both sides.

e. Roller studs shall be high alloy steel with eccentric bushing for adjustment and an automatic self-locking nut.

f. Device shall Include rubber bumpers to cushion device movement at both open and closed position.

g. Paint assembly, except track, rollers and drive mechanism with rust inhibitive primer before shipment. Final painting by others.

h. Door guide shall be 7 gauge. Steel (min).

5. Housings and
Covers:

a. The horizontal mechanism housing shall be constructed of 3/16" mild steel plate. All openings thru the housing(s) shall be baftled.

b. Housing covers shall be constructed of 10 gauge sheet steel. All Housing covers shall be hinged with a continuous piano hinge; inaccessible when the cover is closed.

c. Housing covers shall be locked to the track box with button head security

fasteners. d. The vertical lock bar housing and cover shall be constructed of7

gauge sheet steel.

e. The vertical lock cover shall be removable only when the horizontal cover has been removed.

f. All Housings shall include all trim and fasteners to provide a complete and finished installation.

g. Where several Devices are grouped together, the housing covers shall be constructed to appear continuous; without gaps or holes between the housings.

Devices U thru Z: Not Used

PART 3- EXECUTION

3.1 EXAMINATION

A. Examine detention doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance of detention door hardware.
   1. Examine roughing-in for embedded and built-in anchors to verify actual locations of detention door hardware connections before detention door hardware installation.
   2. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of detention door hardware.

B. Inspect built-in and cast-in anchor installations before installing detention door hardware to verify that anchor installations comply with requirements. Prepare inspection reports.
   1. Remove and replace anchors where inspections indicate that they do not comply with specified requirements. Reinspect after repairs or replacements are made.
   2. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.

C. Verify locations of detention door hardware with those indicated on Coordination Drawings.

D. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified detention door hardware installation.

E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Examine doors, frames, and hardware for damage, defects, and suitability for intended use.

Restore all parts or items found damaged, defective or inadequate, or replace with good material before installation.

3.3 INSTALLATION

A. Fitting
   1. Fit all Devices accurately and properly. Remove exposed parts until after painters finishing is completed, then reinstall. Securely fasten all fixed parts. Fit faces of mortised parts snug and flush. Make sure operating parts move freely and smoothly without binding, sticking, or excessive clearance.

B. Adjusting and Finishing

1. After work has been otherwise completed, examine all Devices for complete and proper installation. Lubricate bearing surfaces of moving parts. Adjust latching and holding devices to proper function. Adjust door control devices to proper speed and power. Test keys for conformance to approved keying system. Clean all exposed surfaces, check for surface damage and polish.

3.4 DEFECTIVE WORK

A. Where devices are found defective in materials or installation; rework, restore, replace, or otherwise correct as directed.

B. Following will be considered as defective materials: I. Unauthorized substitutes.
2. Items delivered with missing, broken, damaged, or defaced parts.
3. Items of incorrect hand or function.

c. Following will be considered as defective installation:
1. Items broken, damaged, or defaced after delivery.
2. Items incomplete, misaligned or incorrectly located.

D. All expenses incurred by the Architect or Owner in troubleshooting security hardware problems, caused by inadequate workmanship or other form of poor performance on the part of a contractor, shall be borne by that contractor.

3.5 SPARE PARTS

A. Provide the following Spare parts for Owner's Attic Stock:
I. One (1) motor assembly for each type provided on the project.
2. Two (2) rack/pinon assemblies
3. Four (4) sets of carriage wheels/bearings
4. Four (4) sets of limit switches for each type provided on the project.

B. Packaging and Delivery:
1. All items for Attic Stock shall be neatly packaged for long-term storage.
2. All packages shall be clearly and permanently labeled. a. Contents name and part number(s)
b. Manufacturer Name, address and telephone c. Date of delivery to Owner
d. Packaging shall include written information on replacement instructions
3. DEC shall prepare a shipping transmittal for Spare parts in this section and shall obtain a receipt from the Owner for these items. DEC shall provide copies of these documents within the Maintenance Manuals and shall provide copies to the CM/GC, The Owner, and the Architect.

END OF SECTION 11 19 30

# SECTION 11 19 40 - DETENTION SCHEDULES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Special Conditions and Division 1, as well as Section 11 19 00, DETENTION EQUIPMENT apply to this Section.

### 1.2 SUMMARY

A. General
1. This section consists of Schedules listing Detention Doors and Windows
2. The specification together with the drawings and schedules cover the required units.

B. Related work specified elsewhere includes, but is not limited to:
1. Section 11 19 00 Detention Equipment -General
2. Section 11 19 10 Detention Hollow Metal
3. Section 11 19 20 Security Locks and Hardware
4. Section 11 19 50 Security Glass and Glazing
5. Division 13 80 00 Electronic Security

### 1.3 SUMMARY: The following Schedules are bound into the specifications immediately following this Section:

A. Detention Door Schedule (DDS)

B. Detention Window Schedule (DWS)

### 1.4 ABBREVIATIONS and TERMS

The following Abbreviations are used in the Detention Schedules

A. Materials and Miscellaneous

1. AL Aluminum
2. CH Chainlink
3. GR Grating
4 HM Hollow Metal
5. PL Steel Plate
6. SHM Security Hollow Metal
7. SS Stainless Steel
8. SG Security Glass
9. SH Security Hardware
10. SWD Security Wood
11. WD Wood
12. WW Woven Wire Mesh

13. EXT Exterior
14. INT Interior
15. SW Swinging Door
16. SL Sliding Door
17. FIX Fixed opening (DWS Only)
18. OP Operable (DWS Only)
19. DDS Detention Door Schedule
20. DWS Detention Window Schedule

B. Security Levels (See Section 11190)

1. 1 60 min. attack
2. 2 30 min. attack
3. 3 10 min. attack
4. 4 normal institutional construction
5. N none required
6. SP Special, See all documents
7. BR bullet resistant (44 mag) plus 60min attack

C. Fire Ratings (UL)

1. A 3 hr fire rating
2. B 1 ½ hr fire rating
3. C 60 min. fire rating
4. D. 20 min fire rating
6. X UL Construction – no label

D. Smoke Protectrion

1. N No rating required
2. Y Requires gasketing

E. LOCK TYPES / HARDWARE

1. The Lock Types listed in the Door Schedules are specified in section 11 19 20 – SECURITY LOCKS AND HARDWARE.

2. The **Lock Type / Hardware Set / Key Side** columns constitute the description of the Security Hardware Set. (ie: A2/SH-02/BS)

3. Security Hardware Sets are scheduled in section 11 19 20.

F. KEY SIDE

1. BS Key Both Sides
2. HS Key on Hinge Side only

3. SS Key on Stop Side only

4. SP Special, requires special condition described in section 11 19 20

5. N No key required

G. SECURITY GLASS TYPES

1. 'SG'-X designates Security Glass type specified in section 11 19 50 – SECURITY GLASS AND GLAZING.

2. "GL"-X designates Glass type specified in section 08 80 00 – GLASS and GLAZING.

3. N No glass required

4. X Glass by others

5. SP Special, requires special condition described in section 11 19 50

H. ANCHORS

1. The designations listed under ANCHORS in the Detention Door and Windows Schedules are shown on Sht. A0.31.

I. ACCESSORIES

1. The accessories section of the Detention Schedules indicates items / special conditions for each opening. The item is to be provided when the column is checked in the schedule for that opening.

2. DETENTION DOOR SCHEDULES

a. Food Pass Provide Food Pass: See section 11 19 10 / 11 19 20

b. Spkg. Dev. Provide Speaking Dev: See section 11 19 10 /11 19 60

c. Shutter Provide Vision Shutter: See section 11 19 10

d. Cuff Pass Provide Cuff Pass: See section 11 19 10 / 11 19 20

e. Louver Provide Louver: See section 11 19 10

f. Galvanize Entire Unit to be galvanized: See section 11 19 10

g. Thermal Break Unit to be Thermally- broken: See section 11 19 10 / 11 19 20

3. DETENTION WINDOW SCHEDULES

a. Spkg. Dev. Provide Speaking Dev: See section 11 19 10 /11 19 60

b. Talk Thru.. Provide Talk-Thru Framing: See section 11 19 10

c. Paper Pass. Provide Paper Pass: See section 11 19 10 /11 19 60

d. Trans. Dwr. Provide Transaction Drawer: See section 11 19 10 /11 19 60

e. Pkg Pass. Provide Package Pass: See section 11 19 10 /11 19 60

d. SS Screen Provide SS Screen: See section 11 19 60

d. Galvanize Entire Unit to be galvanized: See section 11 19 10

d. Thermal Break Unit to be Thermally- broken: See section 11 19 10 / 11 19 20

J. ELECTRONICS

1. **Access Control** – Schedules checked in this column indicate that the opening has access control (card reader, push-pad, biometrics, etc) and must be coordinated with division 13 80 00.
2. **Electric Key** – Schedules checked in this column indicate that the opening has electric key control at the opening. See division 13 80 00 documents and Section 11 19 20.
3. **Pushbutton** – Schedules checked in this column indicate that the frame has a pushbutton device required in one or both sides. key control at the opening. See division 13 80 00 documents and Section 11 19 20.
4. **Emergency Release** – Schedules checked in this column indicate that the opening is required by be on the emergency release function. See division 13 80 00 documents and Section 11 19 20. (Note Division 13 80 00 requirements shall control this feature, whether or not a particular opening is thus scheduled).
5. **Intercom** – Schedules checked in this column indicate that the frame has an intercom device required in one or both sides. See division 13 80 00 documents .
6. **Interlock** – Schedules checked in this column indicate that the opening is interlocked with other openings. See division 13 80 00 documents and Section 11 19 20.
7. **Monitor** – Schedules checked in this column indicate that the opening is monitored from a remote location. See division 13 80 00 documents and Section 11 19 20.
8. **Remote** – Schedules checked in this column indicate that the opening is remotely controlled. See division 13 80 00 documents and Section 11 19 20.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

PART 4 - SCHEDULES

**SEE FOLLOWING DETENTION DOOR SCHEDULE.**

**For Detention Windows, see Sheet A0.40**

# SECTION 11 19 50 – SECURITY GLASS AND GLAZING

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

1. Furnish all labor, materials, tools, equipment, and services for all detention equipment work as indicated, in accord with provisions of these specifications and all Contract Documents.
2. Comply with all requirements as outlined in General, Special, and Supplemental Conditions and Division 1 of these documents.
3. See Detention Door & Window SCHEDULES in Section 11 19 40.
4. See Architectural Drawings.

### 1.2 SUMMARY

A. This Section includes the following:
   1. Security glazing.
   2. Glazing accessories.

B. Related Sections: The following Sections contain requirements that relate to this Section.
   1. Section 11 19 00 Detention Equipment - General
   2. Section 11 19 10 Detention Hollow Metal
   3. Section 11 19 20 Security Locks and Hardware.
   4. Section 11 19 40 Detention Schedules
   5. Section 11 19 60 Detention Furniture and Accessories

### 1.3 SUBMITTALS

A. Product data for each security glazing type, including type of materials, thickness, method of test, and performance.

B. Test reports showing compliance with specified requirements.

C. Certification by manufacturer that products supplied comply with performance requirements specified.

D. Maintenance data covering cleaning and protection requirements.

### 1.4 QUALITY ASSURANCE

A. Certified Safety Glazing: Category II products complying with test requirements of 16 CFR 1201 and ANSI Z97.1, certified by Safety Glazing Certification Council, and permanently labeled.

B. Ballistics-Resistant and Forced-Entry Resistant Performance: Provide products identical to those tested for compliance with requirements indicated per tests specified for specific glazing types.
   1. Have tests performed by qualified independent testing agency.
   2. Testing Agency Qualifications: Demonstrate to Associate's satisfaction, based on evaluation of laboratory-submitted criteria conforming to ASTM E 699, that it has the

experience and capability to satisfactorily conduct the testing indicated without delaying the Work.

3. Testing Agencies: Subject to compliance with requirements, acceptable testing agencies are:
   a. ETL Testing Laboratories, Inc.
   b. H. P. White Laboratory, Inc.
   c. Underwriters Laboratories, Inc.
   d. Warnock-Hersey International, Inc.
   e. Wiss, Janney, Elstner Associates, Inc.

C. UL Test: Underwriters Laboratories, Inc., UL 752--Standard for Bullet Resisting Equipment. Provide UL-labelled products.

D. Manufacturer Qualifications: Firm experienced in manufacturing security glazing products that are similar to those indicated for this Project and that have a record of successful in-service performance.

E. Installer Qualifications: Engage an experienced Installer who has specialized in installing security glazing similar to that required for this Project.

F. Security Fasteners: All equipment specified herein shall utilize only security-type fasteners where removable fasteners are allowed in the construction of the item or required for anchorage.

1. For Approved Security Fasteners on this project see Division 05 05 10. Where security fasteners are references within this specification they shall be of the type and style listed in section 05 05 10. See each subsection and/or product for the sizes of fasteners required.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect products according to manufacturer's recommendations. Specifically, avoid damage to glass edges, and prevent damage from temperature changes, sunlight, and moisture.

1.6 PROJECT CONDITIONS

A. Keep at the Project site, for the duration of glazing operations, a copy of the each referenced document that applies to installation and each manufacturer's installation instructions.

B. Environmental Conditions: Do not install glazing when either air or substrate temperature exceeds the range recommended by sealant manufacturer or when substrate is wet, damp, or covered with snow, ice, or frost.

C. Install bulk sealants only at air and substrate temperatures above 40 deg F.

1.7 WARRANTY - MODIFIED IONOMER PRODUCTS

A. Warranty: Submit a written warranty, executed by manufacturer, agreeing to replace modified ionomer laminates that delaminate within 7 years from date of Final Inspection and Acceptance. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
   1. Laminated Glass and Polycarbonate/Glass Laminate Products:
      a. Falconer Glass Inc.
      b. Globe-Amerada Glass Co
      c. Laminated Glass Corporation
      d. GE Insulgard,
      e. Viracon Inc.
      f. Saint Gobain, Sully

2.2 BASIC SECURITY GLAZING PRODUCTS

A. Float Glass: Type I (transparent glass, flat), Quality q3 (glazing select), complying with the following standards.
   1. Clear Tempered Glass: ASTM C 1048, Condition A (uncoated surfaces), Class 1 (clear), Kind FT (fully tempered).

B. Polycarbonate Sheet: Rigid, flat polycarbonate sheet; thicknesses as indicated.
   1. Relative Burning Characteristics: Average extent of burning less than 1 inch, when tested per ASTM D 635, using the thickness of material indicated for Project.
   2. Mar-Resistant Coating: Apply on surfaces exposed to air.

C. Laminated Units: Multiple plies laminated together with interlayer, using heat and pressure, without air pockets or contaminants between plies.
   1. Interlayer for All-Glass Units: Polyvinyl butyral interlayer specifically designed for lamination and with demonstrated long-term ability to maintain physical and visual properties under installed conditions.
   2. Interlayer for Polycarbonate Units: Polyurethane or other material recommended by glazing manufacturer, specifically designed for lamination and with demonstrated long-term ability to maintain physical and visual properties under installed conditions.

D. Sealed Insulating Units: Factory-assembled multiple lites, separated by and sealed to spacers forming air-tight, dehydrated air spaces(s), complying with ASTM E 774, Class CBA, certified by Insulating Glass Certification Council.
   1. Spacer Seals: Dual seal; polyisobutylene primary seal and silicone secondary seal or other combination acceptable to glazing manufacturer.
   2. If units are fabricated at an elevation significantly different from that of the Project site, temporarily vent internal air space, then subsequently seal vents.

## 2.3 SECURITY GLAZING TYPES

A. Security Glazing Types:

General: The master glazing type list is shown on both Detention Door Schedule and Detention Window Schedule. Security Glass types used on this project are described as follows:

1. SECURITY GLASS CATEGORY SG01 (60 MINUTE ATTACK RATING)
   a. Types SG-01a, SG-01c, and SG-01d are Not Used on this Project
   b. Type **SG-01b**: (Laminated Polycarbonate); Shall be PoweR-Lite LP 750 laminated polycarbonate glazing as manufactured by Global Security Glazing or equal. The security glazing unit is constructed as follows:
      1) 1/8-inch polycarbonate sheet. (abrasive resistant)
      2) Clear urethane laminating interlayer 15 mils or less thick.
      3) 1/2-inch polycarbonate sheet.
      4) Clear urethane laminating interlayer 15 mils or less thick.
      5) 1/8-inch polycarbonate sheet. (abrasive resistant)
      6) Overall thickness (Nominal) = 3/4”
      7) Color = Clear

   PROVIDE AS LISTED IN THE DETENTION DOOR SCHEDULE and DETENTION WINDOW SCHEDULE (see SCHEDULES Manual).
2. SECURITY GLASS CATEGORY SG02 (40 MINUTE ATTACK RATING)
   a. NOT USED
3. SECURITY GLASS CATEGORY SG03 (20 MINUTE ATTACK RATING)
   a. NOT USED
4. SECURITY GLASS CATEGORY SG04 (15 MINUTE ATTACK RATING)
   a. NOT USED
5. SECURITY GLASS CATEGORY SG05 (20 MIN UL FIRE RATING)
   a. NOT USED.
6. SECURITY GLASS CATEGORY SG06 (45 MIN UL FIRE RATING)
   a. NOT USED
7. SECURITY GLASS CATEGORY SG07b (1/2” Tempered Glass)
   a. NOT USED
8. SECURITY GLASS CATEGORY SG08 (60 MINUTE ATTACK w/ BALLISTICS)
   a. NOT USED
9. SECURITY GLASS CATEGORY SG09 (60 MIN ATTACK w/ BALLISTICS, Plus 45 MIN UL)
   a. NOT USED

## 2.4 FABRICATION

A. Cut tempered glass to size and shape and drill holes prior to tempering.

B. Fabricate glazing with bite and edge clearance dimensions, including tolerances, as recommended by manufacturer and FGMA "Glazing Manual." Exception: Where specific bite dimensions are indicated on drawings, as required for proper securement of glazing in frames, comply with those dimensions.

C. Cut or drill holes in laminated units.

D. Grind exposed edges smooth, using methods recommended by manufacturer.

2.5 GLAZING ACCESSORIES

A. Installation Materials--General: Select products that have appropriate performance characteristics as recommended by glazing manufacturer and that are compatible with materials they will contact.

B. Glazing Tape: Precured, 100 percent solids, butyl polyisobutylene rubber with internal spacer rod, complying with AAMA 807.1 tape, as described in AAMA 800-86.

C. Glazing Sealant: Neutral-curing silicone complying with ASTM C 920, Grade NS, Type S or M, Class 25, Uses NT, A, G, and O--as applicable to glazing substrates indicated.
1. Color: As selected by the Associate from manufacturer's standard colors.

D. Dense Compression Gaskets: Preformed neoprene, EPDM, or thermoplastic polyolefin rubber, complying with ASTM C 864; style and size so that soft gasket will be compressed at least 25 percent when glazing is fully installed.

E. Glazing Blocks: Neoprene, EPDM, or silicone.
1. Setting Blocks: 80 to 90 Shore A hardness.
2. Spacers: As required to provide face and edge clearances recommended by glazing manufacturer.

F. Backer Rods: Flexible, nonabsorbent, compressible polyurethane foam, either open-cell or nongassing closed-cell, unless otherwise restricted by sealant manufacturer; preformed to appropriate size and shape.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine frames and rabbets in which glazing is to be installed for possible damaging conditions. In particular, check for conditions that would void the manufacturer's warranty.

B. Submit Installer's report describing unacceptable conditions.

C. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean surfaces to receive glazing just before installing glazing.

3.3 INSTALLATION - GENERAL

A. Comply with recommendations for installation contained in the FGMA "Glazing Manual" and "Sealant Manual" except when specifically not recommended or prohibited by the glazing or glazing accessory manufacturer; comply with manufacturers' recommendations.

B. Protect glazing from edge and surface damage during handling and installation.

C. Do not install glazing that has edge or surface damage or defects that reduce glazing strength or diminish appearance.

D. Install unsymmetrical laminates with proper side out, according to their tested configuration.

E. Permanently adhere setting and edge blocks to frame.

F. Do not block weep holes.

G. Applied Stops: Fasten as indicated, after glazing has been set in frame. Do not exert excess force on glazing and glazing spacers.

3.4 GASKET GLAZING (DRY)

A. Secure compression gaskets so they will not work out under normal movement.

B. Install gaskets so they fit tightly at corners, allowing for stretch during installation.

C. Do not use joints in gaskets, except at corners.

D. Miter-cut corners and seal joint with sealant.

E. Install gaskets so they protrude slightly past face of frame.

3.5 TAPE GLAZING

A. Install tape continuously, placed so that when compressed the exposed face will be flush with the face of the framing.

B. Do not use joints in tape, except at corners; seal joints with compatible sealant.

C. After installation of stops, apply fillet bead of glazing sealant over exposed tape on both sides of glazing.

3.6 PROTECTION AND CLEANING

A. Apply warning tape or bands across opening without touching glazing, immediately after installing glazing in frames.

B. for Substantial Completion.

3.7 OWNER PERSONNEL INSTRUCTION

A. Have manufacturers' maintenance instructions on hand at time of instruction.

B. Instruct designated Owner personnel on maintaining security glazing.

END OF SECTION 11195

# SECTION 11 19 60 - DETENTION FURNITURE AND ACCESSORIES

## PART 1- GENERAL

### 1.1 OVERALL

A. General:

1. Furnish all labor, materials, tools, equipment, and services for all detention furniture and accessories work as indicated, in accord with provisions of these specifications and all Contract Documents.
2. Comply with all requirements as outlined in General, Special, and Supplemental Conditions and Division I of these documents, including section 11 19 00.
3. See Architectural Drawings.

B. Abbreviations

1. See Abbreviations in Detention Door and Window Schedules.
2. DEC: Detention Equipment Contractor.
3. ESS: Electronics Systems Subcontractor. (See Division 28)
4. CM/GC: Construction Manager and/or General Contractor.

C. Security Fasteners:

1. All equipment specified herein shall utilize only security-type fasteners where removable fasteners are allowed in the construction of the item or required for anchorage.
2. For Approved Security Fasteners on this project see Division 05 05 10. Where security fasteners are references within this specification they shall be of the type and style listed in section 05 05 10. See each subsection and/or product for the sizes of fasteners required.
3. Furnish exposed fasteners in color and finish to match item fastened. Furnish fasteners of the same metal as item fastened, except use plated brass or stainless steel for all aluminum items.

## PART 2- PRODUCTS

### 2.1 SECURITY FURNITURE AND ACCESSORIES

A. Acceptable Manufacturers: Except as otherwise specified, the equipment and materials of this Section shall be products of the following

manufacturers: Furniture

1 ) Norshield, Montgomery, AL
2) Southem I Folger Company, San Antonio, TX
3) Chief industries, Inc., Grand Island, NE
4) KLN Corp., San Antonio, TX
5) Bob Barker Company, Fuquay-Varina, NC

6) Wil lo Products, Decatur, AL

7) Peterson Industries, CA Accessories

8) Insulgard Corp., Hyattsville, MD (Pass-thru units)

9) C. R. Laurence, Las Angeles, CA (Pass-thru units)

10) Safer Inc., Olympia, WA (inmate grab-bars)

11) Creative Industries, Indianapolis, IN

12) Viking Products, Orange, CA

B. Finishes: All work under this section shall be delivered to the jobsite with one of the following finishes (as specified in the article)

1. Factory Primed: Finish work shall be cleaned of rust, oil and impurities, and phosphate coated to condition the surfaces to resist and inhibit corrosion and promote paint adhesion. Surfaces shall be coated with Sherwin Williams universal Primer #B50NZ6, or equal. Thickness shall be not less than 3 mil dry.

2. Factory Plated /Stainless: All parts scheduled to be stainless steel shall be type 304 stainless in gauges listed with #2 finish. All parts scheduled by manufacturer to be plated shall be US26D orUS32D.

3. Parts or items scheduled for "Factory finish" shall have baked-enamel finish or powder coat finish as per manufacturers' recommendations -See individual Item.

C. FURNITURE and ACCESSORIES ITEMS

1. SD, Talk-Thru Device: (Creative Industries #CLD103 or equal) Provide stainless steel talk- thru device for talking through security glass. Unit shall be 6" dia. Unit shall be constructed of heavy stainless steel and shall be designed to allow natural voice transmission while pre- venting the passage of contraband. DEC shall coordinate requirements with Detention Glass types. Provide spacer rings as required. Note: Provide (1) speaking device centered above any of the following passthu devices: Paper pass; Transaction Drawer, Package Pass, or Revolv- ing Pass-thru unit.

2. PP, Paper Pass: (Creative Industries #BRT3I6, or equal). Provide stainless steel deal tray thru the security HM framing. See plans and window elevations for locations. Tray unit shall be I2" wide x IO" deep x 2" high. Finish shall be #304, brushed stainless.

3. LPP, Lockable Paper Pass: This unit is NOT a furniture/Accessories item. This unit is integral to the hollow metal construction as shown in the documents.

4. TD, Transaction Drawer: Not Used

5. PK, Package Pass: Not Used

6. RP, Revolving Pass-Thru: Not Used

7. KD, Key Drop Unit: Not Used.

8. CP, Secure Clothing Pass-Thru: Not Used.

9. FP, Thru- Wall Food Pass: Not Used

10. SAP, Security Access Panel: This unit is NOT a furniture/Accessories item. Provide

where shown on the detention plans and/or Detention Schedules.

11. GB, (a,b,c) Detention Grab-bar: ( Safebar grab bar Models 3600S-G, and 4800S-G) Shall be provided as shown on the drawings (NOTE: For locations, see Detention Floor Plans). Pro- vide bullnose section at the ends of all bars. Provide continuous outside and/or outside comers as required or miter bars to fit field conditions.
12. DT, Pedestal Dayroom Table: Not Used
13. M, Mirrors: (SSCo 432,or equal): Provide detention mirrors where shown on drawing. Mirror shall be 20 gauge stainless steel face plate polished to a mirror finish with separate I6 gauge chrome plated steel frame having satin chrome finish. Mirror size(s) as detailed. Mirror frame to be attached with I/4" security screws, heads to have same chrome finish as frame. If mirror is mounted on concrete or masonry walls provide 3/I6" thick steel back plate embedded in wall, sized to receive attachment of mirror assembly.
    a. 1M indicates one mirror. 2M indicates two mirrors.
14. SH, Safety Clothing Hook: Not Used.
15. WD, Wall Mounted Desk I Stool: Not Used.
16. FB, Floor Mounted Bench: Not Used..
17. VS: Visiting Shelves: (See Details): Provide 12ga Stainless Steel shelves with support brack- ets and wall trim as shown on the Detention Drawings. Shelf to be 12 gauge stainless steel, type 304 with No. 2 finish. Shelves to be lengths shown on drawings x 12" wide. Shelf sup- port angles shall be 10 gauge x 2 1/2" x 2 1/2" Attached to the walls with 3/8" dia. Expansion Bolts at 16"oc (max). Welds to be of neat appearance. Required anchor bolts to be provided by installer.
18. TS: Toilet Shield: (See Details): Provide 14ga Steel Toilet Shield units with support brack- ets and wall trim as shown on the Detention Drawings. (See details on dwg A8.54) Shield to be 14 gauge steel panel construction. Shields to be lengths shown on drawings x 2"thick. Shield supports shall be as detailed. Units shall be attached to the walls /floors with 3/8" dia. Expansion Bolts at 16"oc (max). Welds to be of neat appearance. Required anchor bolts to be provided by installer.
19. BS, Book Shelf: Not Used
20. SS, Shower Seat: Not used

PART 3- EXECUTION

A. Inspect surface to receive work under this section. Notify the Architect in writing if surface is not satisfactory for application of materials. Commencement of work constitutes acceptance of surface.

B. Comply with manufacturer’s instructions.

C. Comply with Section 11 19 00.

END OF SECTION 11 19 60

# SECTION 11 97 00 - SECURITY METAL CEILINGS

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes medium [Grades 3 & 4] security single skin plank type acoustical and non-acoustical ceiling systems, as applicable, and installation where indicated.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 REFERENCES

A. ASTM International (ASTM)

1. A 1008, Specification for Steel, Sheet and Strip, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability.
2. A 1011, Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability.
3. A 653, Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot Dipped Process (Commercial Steel).
4. A 666, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar.
5. B 117, Standard Practice for Operating Salt Spray (Fog) Apparatus.
6. D 610, Standard Test Method for Evaluating Degree of Rusting on Painted Steel Surfaces.
7. D 714, Standard Test Method for Evaluating Degree of Blistering of Paints
8. D 1735, Standard Practice for Testing Water Resistance of Coatings Using Water Fog Apparatus.
9. C 635, Standard Specification for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
10. C 636, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
11. C 423, Standard Test Method for Sound Absorption and Sound Absorption Coefficient by the Reverberation Room Method.
12. F2696, Standard Test Methods for Physical Assault on Overhead Horizontal Fixed Barriers for Detention and Correctional Facilities.
13. E-84, Standard Test Method for Surface Burning Characteristics of Building Materials.

B. International Standards Organization (ISO)

1. 9001 - Standards for Quality Management.

C. Ceilings & Interior Systems Construction Association (CISCA)

1. Guidelines.

D. Abbreviations:

1. Detention Equipment Contractor (DEC)

1.4 TESTING AND PERFORMANCE

A. Security grades for each security ceiling type shall be indicated on the reflected ceiling plan (RCP).

B. Acoustical Performance: (Confirm with Architect)

1. Single skin plank ceiling system shall provide a NRC of not less than 0.80 when tested in accordance with ASTM C 423 and a Sound Transmission Class (STC) of not less than 19 when tested in accordance with ASTM E 90 and ASTM E 413.
2. Acoustical fill flame spread index shall not exceed 15 with smoke developed value not exceeding 5 when tested in accordance with ASTM C 84.

C. Security Performance:

These test methods are not to provide a measure of resistance for ceiling assemblies subjected to attack by corrosive agents. These test methods are intended to evaluate simulated forced exit resistance of a ceiling assembly to attacks using battering devices and static loading.
The primary purpose of these test methods is to approximate the levels of abuse to which ceiling assemblies may be subjected in the course of a forced exit in a correctional facility. The desired result of its use is to help provide insurance of protection and safety of the inhabitants or occupants of the facility where these ceiling assemblies will ultimately be used.
It is recommended that the Architect determines which security rating is required for each opening as described in Table 1.

1. Test Samples:

a. A ceiling assembly covering an 8 feet-0 inch x 12 feet-0 inch area using the desired ceiling panel system shall be in accordance with ASTM F2697 and installed in accordance with the manufacturer’s instructions.
b. The manufacturer shall permanently mark the test samples and retain them at the manufacturing facility for future reference for a period of one (1) year from the date tested. All tests will be verified using an independent agency. Test reports shall include photographs of the testing apparatus and installation instructions including templates for the items of hardware used.

2. Specimen Preparation:

   a. The construction and size of the test ceiling assemblies consisting of single skin ceiling panels, wall mounting channels and angles, hangers, and fasteners shall be representative of the application under investigation and the desired security classification needed for the application.
   b. The test assembly shall be installed in a fixture constructed using structural steel tubing, channel and plate to provide a means for mounting a test section of ceiling in the horizontal position, and for applying the required series of impacts and static load applied upward at the target areas specified in the ASTM F2697 standard.
   c. Mount the ceiling assembly under test in the rough opening in accordance with the manufacturer's installation instructions.

3. Test Procedures:

   a. Ceiling Assembly Impact Testing:

      1) Impact testing under this Section is performed using the methods and testing equipment described in ASTM F2697.
      2) Scope: These tests are designed to evaluate a ceiling assembly's ability to resist repetitive impact forces at the designated critical areas. The same assembly used for the static load tests may be reused for this test, or another assembly may be used if so desired.
      3) Significance of use: This test method is intended to closely simulate a sustained battering ram-style attack and provide an evaluation of the assembly's capability to prevent, delay and frustrate forced exit. This impacting simulates a person using a sledgehammer or another battering implement to escape or exit through the ceiling system.
      4) Apparatus: The test fixture described in paragraph 1.4.,C, 1, a, and shown in Figure 1 in ASTM F2697 shall be used in this test.
      5) Ram: The impact device shall consist of a portable see-saw type impactor as shown in Figure 2 in ASTM F2697. The device shall be capable of delivering impacts of 200 ft. lbf. Against the test ceiling and be able to be positioned under the required target locations designated in Table 1 in F2697. The device shall be constructed such that a blunt impactor (Figure 3 in F2697) or sharp impactor (Figure 4 in F2697) can be attached. Both impactors are to be fabricated from C101-1020 carbon steel. The blunt impactor shall have a striking surface area of 4 ± .04 sq. in. (2580 $mm^2$ ± 25.8 $mm^2$) and shall have rounded edges similar to a 10 lb. sledge hammer head. The sharp impactor shall have a point similar to the end of a new Fireman's axe at the beginning of the test sequence.
      6) Procedure: With the exposed (room) side of the ceiling facing downward, subject each location on the sample ceiling to the number of blows at the required impact energy and locations found in Table 1 in ASTM F2697. Staring with the blunt

impactor, followed by the sharp impactor, deliver the required impacts at the specified foot pounds per impact in cyclic sequences of 50 impacts each. Repeatability of impact location during each series shall be no more than +/- 2 inches horizontally and vertically from the designated impact target. Specimen fails if a 5 inches x 8 inches x 8 inches rigid rectangular box can pass through the ceiling following impacts.

b. Static Load Testing (uplift):

1) Scope: This test is designed to evaluate the capability of a ceiling assembly to resist a steadily increasing force applied at corner points, joints between ceiling panels, and the ceiling assembly's central point.
2) Significance of Use: This test method is intended to simulate a ceiling assembly's resistance to uplift at vulnerable locations.
3) Apparatus: The test fixture described in paragraph 1.4, C, 1, a, and shown in Figure 1 in ASTM F2697 shall be used in this test.

   A hydraulic ram and pump equipped with a gauge or load cell shall be used to provide the static load. The pump ram and gauge shall be calibrated by the testing laboratory and a chart provided that converts pounds-force per square-inch gauge (kilograms per square meter) to pounds-force (Newtons). If a load cell is used, it shall be certified by the testing laboratory prior to use. (see Figure 5 Static Load Apparatus)
4) Procedure: Apply static load to the attack side of the component at the locations and magnitude appropriate to the security rating desired in accordance with that specified in Table 1 in F2697 and using a 1/4 in. thick by 12 in. square contact plate. Specimen fails when 1) the desired load cannot be achieved without physical failure, or 2) if a 5 in. x 8 in. x 8 in. rigid rectangular box can pass through the ceiling or, 3) if the permanent deflection exceeds the criteria in F2697 (25% of L180).
5) Record the pass / fail results at 200 lb. increments to produce a graph, static load versus failure. Increase the load until target loads for each sample are reached.

Table 1: Security Grades and Load Requirements for Ceiling Panels

| Grade Number | Recommended Ceiling Panel Face Sheet Thickness B in. gauge | Number of Impacts at Each Target Location | Static Load - lbf (N) Lbf (N) |
|---|---|---|---|
| 3 | 0.093 12 Single Skin Plank Panel | 200 | 1000 |
| 4 | 0.067 14 Single Skin Plank Panel | 100 | 750 |
| Refer to ASTM F2697 for Target Locations for Ceiling Impact Test and Ceiling Static Load Test | | | |

## 1.5 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to the Drawings, and other Specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected

B. Manufacturer's Qualification:

1. Manufacturer shall provide evidence of having personnel and plant equipment capable of fabricating ceiling assemblies of the type specified herein. Manufacturer shall provide current documentation of the number of employees, a listing of their production equipment, and a description of their manufacturing facility.
2. Manufacturers shall be ISO 9001 certified and shall be required to present their Certificate of Registration upon request. The manufacturer's registrar shall be nationally recognized and shall provide the manufacturer with periodic factory follow up audits reaffirming the manufacturer's continuing compliance with their written quality program.
3. Manufacturers shall have a minimum of five (5) years of experience successfully producing security ceiling systems of the types and sizes required in the contract documents. Upon request the manufacturer shall provide a list of successfully completed projects and the dates they were completed.
4. Manufacturers shall have written test reports of their having passed the testing requirements of Paragraph 1.4 and using their current materials and production processes.
5. Products other than those specified or approved will be considered if the following items are submitted to the Architect at least 10 days prior to bid due date.

    a. Physical samples
    b. Test reports; the manufacturer shall submit to the architect an independent testing laboratory report certifying that ceiling assemblies meet the performance requirements of Paragraph 1.4 and are constructed in accordance with Paragraphs 2.1 of these specifications.
    c. Qualifications: the manufacturer shall submit to the Architect his qualifications as described in Paragraph 1.5, B.
    d. Catalog and technical information.
    e. References (including name and telephone number or person to contact)
    f. Notarized certification that the product conforms to the requirements, quality, and durability of the products specified herein
    g. Notarized certification that manufacturer conforms to the manufacturer's qualifications required in this specification
    h. Agreement to reimburse the Architect or Owner for costs associated with changing from the specified products. If a substitution is approved, it will be in the form of an addendum to the bidding documents.

C. Acceptable Manufacturers:

1. Trussbilt, LLC, Huron, SD; Phone: (605) 352-5283.

2. Other manufacturers must submit their qualifications, test reports and product deviations to the Architect ten (10) days prior to the bid for approval and comply with Division 01 Section “Project Management and Coordination” regarding substitutions in order to be considered.

D. Installer Qualifications:

1. The installing contractor shall provide a list of three (3) projects where at least one project was 100 cells and has been in operation for at least five (5) years.
2. Technically qualified and experienced in furnishing and installing detention security acoustical panel.
3. Have full time employees with a minimum of 5 years of experience in furnishing and installing detention equipment and detention security systems.
4. Direct distributor or dealer for the manufacturer of detention security acoustical panel system specified or approved.
5. Submit evidence of prior experience in the installation of metal security ceiling systems.
6. Welders and tackers shall be qualified by the American Welding Society’s procedure AWS D1.3.

E. Quality Criteria:

1. All ceiling construction shall be in accordance with construction of assemblies which meet the testing requirements of Paragraph 1.5.
2. Fabrication methods and product quality shall meet standards specified herein.

1.6 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: Submit manufacturer's technical data for each type of security panel and suspension system required.

C. Shop Drawings:

1. Provide detailed drawings including layout of ceiling systems, details of construction, gauges of metal, anchoring details, conditions at openings, installation details and methods, and other data pertinent to the installation, including illustration of sequence of installation to accomplish interlocking panels.
2. Do not begin fabrication of material until shop drawings have been reviewed by the Architect.

D. Samples (if required):

1. Supply a 1 feet-0 inch x 1 feet-0 inch section of each ceiling system being supplied showing wall mounting members and panel sections.
2. All samples submitted shall be of the production type and shall represent in all respects the minimum quality of work to be furnished by the manufacturer. No work represented by the samples shall be fabricated until the samples are

approved, and any downgrading of quality demonstrated by the samples can be cause for rejection of the work.

1.7 DELIVERY, STORAGE AND HANDLING

A. Protect panels from damage during transit to job storage.

B. Inspect panels upon delivery for damage. Minor damage may be repaired provided the finish items are equal in respect to new work and acceptable to Architect/Engineer. Otherwise, remove and replace with new material.

C. The installing contractor shall see that materials are properly stored on planks or dunnage in a climate controlled location. Panels shall be stored in a horizontal position and spaced by blocking. Materials shall be covered to protect them from damage but in such a manner as to permit air circulation.

1.8 WARRANTY

A. All ceiling systems work shall be warranted from defects in workmanship and quality for a period of one (1) year from shipment.

PART 2 - PRODUCTS

2.1 SECURITY CEILING SYSTEMS

A. C4 - Security Metal Ceiling:

1. Description: Security Metal Ceiling
2. Manufacturer: Trussbilt
3. Style: Barrierdek
4. Color: Manufacturer’s standard TBD
5. Size: 2 feet x up to 12 feet
6. Location: Holding Cells and Secure Areas
7. Remarks: Welded 10 GA

B. MATERIAL

1. Panel face sheet minimum thicknesses shall be as follows:

a. Grade 3 - 0.093 in.
b. Grade 4 - 0.067 in.

2. Panel face sheets shall be made of commercial quality, level, hot or cold-rolled steel conforming to ASTM A 1008 CS Type B or ASTM A 1011 CS Type B and shall have a zinc coating applied by the hot-dip process conforming to ASTM A 653 Commercial Steel (CS), coating designation A60 . The steel shall be free of scale, pitting, coil breaks or other surface blemishes. It shall also be free of buckles, waves or any other defects caused by the use of improperly leveled sheets.
3. For severely corrosive conditions and where specified, face sheets and components shall be stainless steel conforming to ASTM A 666, Type 304.

C. CONSTRUCTION

1. Single Skin Inter-Locking Plank Ceiling System - Security Grades 3 and 4.

a. Ceiling Planks: Shall be 24 in. wide and supplied in manufacturer's standard lengths of 8 ft., 10 ft., and 12 ft. All ceiling planks shall have factory formed inter-locking edges and may be perforated with 0.125 in. diameter holes, staggered 0.218 in on center for a 29% open area or non-perforated.

b. Wall Perimeter Angles: Shall be formed angles 0.094 in. minimum thickness and punched 16 in. on center for 3/8 in. diameter anchors. Panels shall be secured to the wall angles using 12 ga. concealed angle clips that can span panel joints.

c. Interim Tee Supports: Tee supports shall be two wall mounting angles bolted back-to-back using 3/8 - 16 bolts, 24 12 in. on center.

d. Suspension for tee supports shall be 3/8 in. galvanized threaded rod, bolted to the above structure and the tee support, 36 in. on center.

e. Fasteners: Any exposed fasteners shall be 1/4-28 pin Torx®, tamper-proof security screws or blind rivets. Wall anchor bolts shall be 3/8 in. diameter and shall be placed 16 in. on center. Anchors for securing the wall moldings to the wall shall be furnished by the ceiling manufacturer and shall meet the required seismic rating.

f. Acoustical material: The inside surface of all perforated ceiling pans shall be covered with a Class "A" black poly-encapsulated fiberglass insulation of sufficient thickness and density to provide the acoustical requirements as outlined in Section 1.4 of this specification.

g. MEP Penetrations: All light and air units are to be sized to fit into and trim off to full panel width openings and shall be independently supported from above by the trade requiring the opening. All panel penetrations are to be cut in the field by the ceiling installer. Lights shall be secured to the panel to stabilize the perimeter of the penetration in the panel by the ceiling installer.

h. Finish: All components of the panel and suspension system visible from the floor side shall have a factory applied finish. Prior to painting, all surfaces shall be cleaned of rust, oil and other impurities by receiving a multi-stage pre-treatment consisting of degrease and phosphate coating, clear water rinse and non-chromate sealer and rinse, to condition the surface of the metal to resist and inhibit corrosion and promote paint adhesion. Finish to be applied after perforation to ensure coating of the perforated holes. Panels and components shall be coated with TGIC Polyester or equal, white powder coat, applied at a minimum of 2 mils thickness (dry).

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. General:

1. Install the ceiling system using the approved submittal drawings and contract documents. Install using the manufacturer's installation instructions.

2. Accurately locate partitions, holes, cut outs and verify locations with other trades.
3. Set closures and steel supports with anchors to suit condition.
4. Erect true and level with close fitting tolerances.
5. Bearing at ends shall be a minimum of 1 in. unless noted otherwise in project drawings

B. Fastenings:

1. Fasten supporting members to each other and to building construction as detailed or as otherwise required to provide a secure, permanent installation.
2. Where fastening spacings and sizes are not shown, use spacings and sizes of bolts, screws and which will develop the full strength of the members before failure occurs in the fastenings.

C. Touch-up Painting:

1. Immediately after installation, areas where the prime or finish coat has been damaged shall be sanded smooth and touched up with same primer or finish touch up paint as supplied by the manufacturer.
2. Remove rust before touch up primer or finish paint touch up is applied.

## 3.2 FIELD QUALITY CONTROL

A. Hold a meeting with other trades to review installation procedures and workmanship with special emphasis on unusual conditions to ensure correct installation procedures.

B. The security panel system shall be installed in place under the supervision of a qualified supervisor, trained and furnished by the installer.

## 3.3 CLEANING AND REPAIR

A. Clean exposed surfaces of ceiling panels, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

B. Replace damaged and broken panels at no expense to Owner.

END OF SECTION

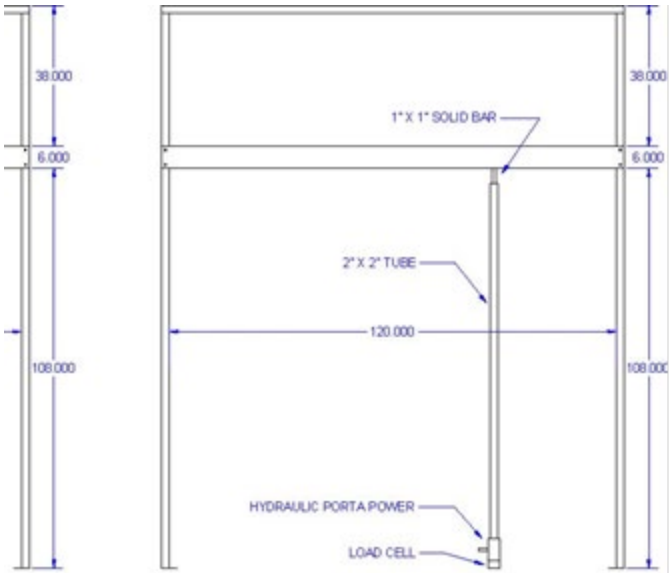


FIGURE 1
Test Assembly Elevation

# SECTION 11 98 12 - DETENTION METAL DOORS AND FRAMES

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, if any, apply to this Section.

### 1.2 SUMMARY

A. Section includes detention rated doors and door frames meeting ASTM F1450 Grades 1-4 for applications including the following as applicable to the project.

1. Detention rated doors and door frames with detention requirement as specified.
2. Fire ratings for doors, door frames and glazing available.
3. Ballistic ratings for doors, door frames and glazing available.

B. Related Sections: Work of all sections, including Division 01 Sections, as required to properly execute the work and as necessary to maintain satisfactory progress of the work.

### 1.3 REFERENCES

A. American National Standards Institute (ANSI)

1. ANSI Z97.1: Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.

B. ASTM International (ASTM)

1. E119, Methods for Fire Tests of Building Construction and Materials.
2. F1450, Standard Test Methods for Hollow Metal Swinging Door Assemblies for Detention and Correctional Facilities.
3. F1577, Standard Test Methods for Detention Locks for Swinging Doors.
4. F1915, Standard Test Methods for Glazing for Detention Facilities.

C. Consumer Product Safety Commission (CPSC)

1. 16 CFR 120, Safety Standard for Architectural Glazing Materials.

D. Glass Association of North America (GANA)

1. GANA - Glazing Manual.
2. FGMA - Sealant Manual.

E. International Building Code (IBC)

F. National Association of Architectural Metal Manufacturers/ Hollow Metal Manufacturers Association (NAAMM/HMMA)

1. 863, Guide Specifications for Detention Security Hollow Metal Doors and Frames.

G. National Fire Protection Association (NFPA)

1. 80, Fire Doors and Windows.
2. 251, Fire Tests of Building Construction and Materials.
3. 252, Fire Tests of Door Assemblies.

H. Underwriters Laboratories, Inc. (UL)

1. 752, Standard for Bullet-Resisting Equipment.
2. 10B, Standard for Safety of Fire Tests of Door Assemblies.
3. 10C, Standard for Safety of Positive Pressure Fire Tests of Door Assemblies.
4. 263, Fire Tests of Building Construction and Materials.

1.4 SYSTEM DESCRIPTION

A. Performance Requirements:

1. Detention Rating: Must meet ASTM F1450 Grades 1-4 and ASTM F1577 as specified. Detention rating of glazing must meet ASTM F1915 Grades 1-4 as indicated or required.
2. Fire Rating: must meet 20, 45, 60, 90 or 120 minutes as specified, if fire ratings are required.
3. Fire Resistive, Temperature Rise Door Assembly Certifications: must meet 60-90 minute fire resistive temperature rise door assemblies tested in accordance with NFPA 252, UL 10B, and UL 10C. Must meet 250 degrees F or 450 degrees F temperature rise door requirements if required.
4. Fire Protective Door Assembly Certifications: must meet 20-45 minute fire protective door assemblies shall be tested in accordance with NFPA 80, NFPA 252, UL 10B, and UL 10C if required.
5. Ballistic Rating and Certifications: Meets UL 752 Levels 1-3 as indicated or required.
6. Testing Laboratory: Test must be conducted by a nationally recognized independent testing laboratory.
7. If fire ratings are required, max. door opening sizes must meet up to 54 inches wide x 120 inches high for single doors. Continuous hinges required for max. door sizes.

B. Listings and Labels:

1. Detention rated doors and framing system shall be under current follow-up service by a nationally recognized independent laboratory approved by OSHA and maintain a current listing or certification. Assemblies shall be labeled in accordance with limits of listings.

C. Appearance:

1. Detention door and door frame assembly shall have a neat, finished appearance with minimum joints at decorative cover intersections.

1.5 SUBMITTALS

A. Submit under provisions of Division 01 Section "Submittal Procedures".

B. Product Data: Submit latest edition of manufacturer's product data providing product descriptions, technical data and installation instructions.

C. Shop Drawings: Submit shop drawings showing layout, profiles and product components.

D. Samples: Submit samples for finishes, colors and textures for Architect's review and approval.

1.6 QUALITY ASSURANCE

A. This Section outlines only minimum standards and requirements. Refer to the Drawings, and other Specifications for additional requirements. Bring all conflicts and discrepancies to the attention of the Architect and do not start work until such conflicts and discrepancies are clarified and corrected.

B. Detention rated doors and door frames must be provided by a single source.

1.7 DELIVERY, STORAGE AND HANDLING

A. General: Comply with Division 01 Section "Product Requirements".

B. Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

C. Delivery: Deliver materials to specified destinations in manufacturer's or distributor's packaging undamaged, complete with installation instructions.

D. Storage and Protection: Store off ground, under cover, protected from weather and construction activities and at temperature conditions recommended by manufacturer.

1.8 FABRICATION DIMENSIONS

A. Field Measurements: Verify actual measurements for openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.9 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document. The manufacturer's warranty is not intended to limit other rights that the Owner may have under the Contract Documents.

1. Warranty Period: Five (5) years from date of shipping.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Specifications are based on Titan Detention Rated Doors and Door Frames as manufactured and distributed by Titan Metal Products, a division of SAFTI FIRST® Fire Rated Glazing Solutions, Merced, CA; Phone: (866) 848-2667, or Architect approved equal. Other manufacturers must have a minimum of five (5) years of experience manufacturing products meeting or exceeding the specifications and comply with Division 01 Section "Product Requirements" regarding substitutions to be considered.

2.2 MATERIALS - DOORS AND DOOR FRAMES

A. Detention rated doors and door frames meeting ASTM F1450 Grades 1-4 and ASTM F1577 as specified. Detention rating of glazing must meet ASTM F1915 Grades 1-4 as indicated or required.

B. Properties:

1. Door profile: 5 inch rail and 2 inch frame standard. 10 inch ADA compliant bottom rail (can be modified with AHJ approval).
2. Maximum Sizes. Can be modified with AHJ approval:

    a. Door: Nominal 3 feet-0 inches wide x 7 feet-0 inches high x 2 inches thick.
    b. Door Frame: 42 inches wide x 86 inches high. Minimum 2 inch faced door frame (fully welded corners); jamb width prepared for 2 inch door. Overall door frame prepared for installation in a concrete block wall or masonry assembly. 4 inch minimum throat opening. Fabrication must comply with UL-63.

3. Door Vision Panel: Glazing must meet ASTM F1915 Grades 1-4 as indicated or required. Individual lites shall be permanently identified with a listing mark.
4. Internal framing: Internal tube steel framing shall conform to ASTM A501. Formed steel retainers shall be galvanized conforming to ASTM A527.
5. Fasteners: Type recommended by manufacturer.
6. Door constructed in accordance with the individual manufacturer's listings or in accordance with HMMA 861-06 and HMMA 850.
7. Insulation: If fire ratings are required, the framing system shall insulate against the effects of fire, smoke and heat transfer from either side. The perimeter of the framing system to the rough opening shall be firmly packed with mineral wool fire stop insulation or appropriately rated intumescent sealant.
8. Fire Rated Glazing: Must be supplied by SAFTI FIRST Fire Rated Glazing Solutions.
9. Glazing accessories: The glazing material perimeter shall be separated from the perimeter framing system with approved flame retardant glazing tape. The SuperLite™ glazing panel shall be caulked continuously around the edge to the tube steel frame utilizing neutral cure silicone. Silicone setting blocks are recommended.
10. 60-90 minute doors meet 250 degrees F/450 degrees F at 30 minutes.

11. Maximum door opening sizes are 54 in. x 120 inches for single doors and 108 inches x 120 inches for pair doors. No intermediate rails required. For max. door sizes, continuous hinges may be required.
12. Ballistic ratings: If required, must meet UL 752 Levels 1-3.

2.3 FABRICATION

A. Assemblies shall be furnished knocked down for field assembly and will be glazed in the field or assembled (should configurations and job site conditions allow).

B. Door assemblies shall be factory prepared for field mounting of hardware.

C. Fabrication Dimensions: Fabricate to approved dimensions. The general contractor shall guarantee dimensions within required tolerance. Obtain approved shop drawings prior to fabrication.

2.4 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designing finishes.

B. Covers shall be chemically cleaned and pretreated; then, finished with one of the following selected by the Architect:

1. High Performance Coraflon Fluoropolymer Finish by PPG. Solid color to be selected by Architect from Titan's Standard Color Chart. Mica, XL, Gloss & Exotics are available at an additional charge.
2. Stainless steel or aluminum clad.
3. Clear, Bronze or Black Anodized.
4. Acrylic urethane custom color.
5. Other.

C. Protect finishes on exposed surfaces from damage by applying strippable, temporary protective covering before shipping.

D. Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

2.5 DOOR HARDWARE

A. Allowed Hardware: All hardware must be listed and certified to Grade 1 ASTM F1450 and ASTM F1577. Note that detention door hardware manufacturers restrict the sale of their products to the end user, an approved manufacturer or a certified detention equipment contractor. Therefore, hardware must be supplied by others.

1. Latches/Locks: Remote manual or electro-mechanical rotary latch/manual or key operated latches.
2. Door (edge) Guards: Minimum 16 ga steel
3. Institutional Hinges: Min. 4-1/2 inches x 4-1/2 inches x 0.180 inch thick; steel; ball bearing type.
4. Door Closers: No security rating needed; must be covered with 16 ga steel cover.

5. Food Pass Drawer: Max. depth is 2.5 inches; Must be fully welded, 16 ga steel, with frame edges welded in place overlapping the door surfaces by 1 inch on all sides, must be lockable from corridor side of the door.

## PART 3 - EXECUTION

### 3.1 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data including product technical bulletins and installation instructions.

### 3.2 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions have been previously installed under other sections and are acceptable for product installation in accordance with the manufacturer's instructions. Openings shall be plumb, square and within allowable tolerances. The Architect shall be notified of any conditions that jeopardize the integrity of the proposed fire wall/door framing system. Do not proceed until such conditions are corrected.

### 3.3 INSTALLATION

A. Installation shall be by a licensed contractor and in strict accordance with the approved shop drawings.

### 3.4 CLEANING AND PROTECTION

A. Protect glass from contact with contaminating substances resulting from construction operations. Remove such substances by method approved by manufacturer.

B. Wash glass on both faces not more than four days prior to the date schedule for inspections intended to establish date of Substantial Completion. Wash glass by method recommended by glass manufacturer.

C. Remove temporary coverings and protection of adjacent work areas.

D. Remove construction debris from project site and legally dispose of debris.

END OF SECTION

**SECTION 21 05 29 – HANGERS AND SUPPORTS FOR FIRE SUPPRESSION PIPING AND EQUIPMENT**

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Pipe, and equipment hangers, supports and associated anchors.

B. Sleeves and seals.

C. Flashing and sealing equipment and pipe stacks.

1.02 RELATED WORK

A. Section 21 13 13 – Wet Pipe Sprinkler System.

1.03 REFERENCES

A. ANSI/ASME B31.1 - Power Piping.

B. NFPA 13 - Standard for the Installation of Sprinkler Systems.

1.04 QUALITY ASSURANCE

A. Supports for Sprinkler Piping: In conformance with NFPA 13.

1.05 SUBMITTALS

A. Submit shop drawings and product data under provisions of Division One.

B. Indicate hanger and support framing and attachment methods.

PART 2 - PRODUCTS

2.01 PIPE HANGERS AND SUPPORTS

A. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch Malleable iron, adjustable swivel, split ring.

B. Hangers for Pipe Sizes 2 to 4 Inches Carbon steel, adjustable, clevis.

C. Hangers for Pipe Sizes 6 Inches and Over: Adjustable steel yoke, cast iron roll, double hanger.

D. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods; cast iron roll and stand for pipe sizes 6 inches and over.

E. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.

F. Wall Support for Pipe Sizes 4 Inches and Over: adjustable steel yoke and cast iron roll.

G. Vertical Support: Steel riser clamp.

H. Floor Support for Pipe Sizes to 4 Inches: Cast iron adjustable pipe saddle, locknut nipple, floor flange, and concrete pier or steel support.

I. Floor Support for Pipe Sizes 6 Inches and Over: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.

J. For installation of protective shields refer to specification section 22 05 29 -3.03.

2.02 HANGER RODS

A. Galvanized Hanger Rods: Threaded both ends, threaded one end, or continuous threaded.

2.03 INSERTS

A. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.04 SLEEVES

A. Sleeves for Pipes through Non-fire Rated Floors: Form with 18 gage galvanized steel, tack welded to form a uniform sleeve.

B. Sleeves for Pipes through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Form with steel pipe, schedule 40.

C. Sleeves for Pipes through Fire Rated and Fire Resistive Floors and Walls, and Fireproofing: Prefabricated fire rated steel sleeves including seals, UL listed.

D. Fire Stopping Insulation: Glass fiber type, non-combustible, U.L. listed.

E. Caulk: Paintable 25-year acrylic sealant.

F. Pipe Alignment Guides: Factory fabricated, of cast semi-steel or heavy fabricated steel, consisting of bolted, two-section outer cylinder and base with two-section guiding spider that bolts tightly to pipe. Length of guides shall be as recommended by manufacturer to allow indicated travel.

2.05 FABRICATION

A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

B. Design hangers without disengagement of supported pipe.

C. Design roof supports without roof penetrations, flashing or damage to the roofing material.

2.06 FINISH

A. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

PART 3 - EXECUTION

3.01 INSERTS

A. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams. Coordinate with structural engineer for placement of inserts.

B. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.

C. Where concrete slabs form finished ceiling, provide inserts to be flush with slab surface.

D. Where inserts are omitted, drill through concrete slab from below and provide thru-bolt with recessed square steel plate and nut recessed into and grouted flush with slab. Verify with structural engineer prior to start of work.

3.02 PIPE HANGERS AND SUPPORTS

A. Support horizontal piping as follows:

| PIPE SIZE | MAX. HANGER SPACING | HANGER DIAMETER |
|---|---|---|
| (Steel Pipe) | | |
| 1/2 to 1-1/4 inch | 7’-0” | 3/8" |
| 1-1/2 to 3 inch | 10'-0" | 3/8" |
| 4 to 6 inch | 10'-0" | 1/2" |

B. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.

C. Place a hanger within 12 inches of each horizontal elbow and at the vertical horizontal transition.

D. Use hangers with 1-1/2 inch minimum vertical adjustment.

E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.

F. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.

G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

H. Support riser piping independently of connected horizontal piping.

I. Install hangers with nut at base and above hanger; tighten upper nut to hanger after final installation adjustments.

J. Portable pipe hanger systems shall be installed per manufactures instructions.

3.03 Insulated Piping: Comply with the following installation requirements.

A. Clamps: Attach galvanized clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ASME B31.9.

B. Saddles: Install galvanized protection saddles MSS Type 39 where insulation without vapor barrier is indicated. Fill interior voids with segments of insulation that match adjoining pipe insulation.

C. Shields: Install protective shields MSS Type 40 on cold and chilled water piping that has vapor barrier. Shields shall span an arc of 180 degrees and shall have dimensions in inches not less than the following:

| NPS | LENGTH | THICKNESS |
|---|---|---|
| 1/4 THROUGH 3-1/2 | 12 | 0.048 |
| 4 | 12 | 0.060 |
| 5 & 6 | 18 | 0.060 |

D. Piping 2” and larger provide galvanized sheet metal shields with calcium silicate at hangers/supports.

E. Insert material shall be at least as long as the protective shield.

F. Thermal Hanger Shields: Install where indicated, with insulation of same thickness as piping.

3.04 SLEEVES

A. Set sleeves in position in formwork. Provide reinforcing around sleeves.

B. Extend sleeves through floors minimum one inch above finished floor level. Caulk sleeves full depth with fire rated thermfiber and 3M caulking and provide floor plate.

C. Where piping penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with U.L. listed fire stopping insulation and caulk seal air tight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

D. Fire protection sleeves may be flush with floor of stairways.

**END OF SECTION**

# SECTION 21 13 13 - WET PIPE SPRINKLER SYSTEM

## PART 1 - GENERAL

### 1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. The Basic Materials and Methods, Section 22 02 00, are included as a part of this Section as though written in full in this document.

C. Refer to Section 21 00 00 for integral requirements.

### 1.02 SCOPE

A. Scope of the work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.

B. The scope and work shall include the extension and modification of the existing sprinkler system to accommodate the new work.

### 1.03 REGULATORY CODES

A. Work in accordance with:

1. NFPA.
2. Local municipal codes that have jurisdiction.

B. Products in accordance with:

1. United Laboratories (UL) listed.
2. Factory Mutual (FM) approved.

### 1.04 CERTIFICATE OF TESTING

A. Furnish Owner with test certificate certifying the system approved by:

1. City Fire Marshall.
2. Insurance Services Officials

## PART 2 - PRODUCTS

### 2.01 FIRE SPRINKLER SYSTEM

A. GENERAL:

1. Work Included:
   a. Design, coordination and installation of inside and outside piping, including sprinkler heads, valves, hangers and supports sleeves.

b. The sprinkler system is a wet type and is designed to provide coverage for entire building. The Contract Drawings indicate the extent and general arrangement, and the various occupancy classifications.
c. Sprinkler heads are not shown.
d. The plans provide a preliminary layout with riser assembly location, flow switch locations, valve locations, and fire department Siamese connections. These are a guide for subsequent preparation of the Contractor's detailed working drawings.
e. Interface system with building fire and smoke alarm system.

2. Quality Assurance: Equipment and installation to meet requirements of NFPA Number 13, latest edition and local authority having jurisdiction. All components of the completed system shall be UL listed for the intended service.

2.02 SUBMITTALS:

A. Submit shop drawings in accordance with Section 22 02 00.

B. Submit preliminary layout showing only head locations for review by Architect/Engineer. Furnish additional heads which may be required for coordinated ceiling pattern without added cost, even though number of heads may exceed minimum code requirements.

C. Submit shop drawings of entire sprinkler system including hydraulic calculations to Architect/Engineer.

D. Provide Architect with six complete sets of final approved shop drawings before starting the installation. Include details of the sprinkler system showing sections, light fixtures, air conditioning, ducts, and a plan giving fire department connections, location of all exposed structures within twenty feet of this structure, and other equipment to be used. Drawings shall bear the stamp of review of the local fire insurance rating organization having jurisdiction.

E. Service Utility Diagram: Furnish Architect with an accurately marked print showing location of underground pipes and valves as installed upon completion of underground Work.

F. Provide a printed sheet giving brief instructions relative to all necessary aspects of sprinkler controls and emergency procedures next to sprinkler riser mains. Instruction sheet to be protected by glass or a transparent plastic cover.

G. Materials:

1. Piping:
   a. All piping above grade shall be:
      - schedule 10 black steel pipe with a rolled groove ends, joined with mechanical coupling and cut groove cast iron fittings for pipe 2-1/2” and greater.
      - schedule 40 black steel threaded pipe and fittings for pipe 2” and smaller.
   b. Acceptable manufacturer:
      - American Tube

- Wheatland Tube
- Gem Sprinkler

c. Acceptable mechanical coupling manufacturer:
- Victaulic
- Grinnell
- Reliable
- Gruvlok

2. Sprinkler Heads:
a. Suspended Ceiling Type: Standard Concealed pendant type with white cover plate.
b. Exposed Area Type: Standard upright type with brass finish.
c. Sidewall Type: Chrome plated finish with matching escutcheon.
d. Temperature rating on fusible links to suit specific hazard area with minimum margin or safety 50 degrees F.
e. Sprinkler heads of the "O"-ring seal type are not acceptable.
f. In natatoriums and pool equipment rooms provide chrome plated or wax coated heads for corrosive environments.
g. Flexible type sprinkler head connection systems are not acceptable.
h. Acceptable manufacturer:
- Reliable
- Grinnell
- Viking

3. Valves:
a. 2" and smaller: bronze, rising stem, inside screw, solid wedge, U.L. listed valve.
b. 2-1/2" and larger: iron body, bronze trim, rising stem, OS&Y, solid wedge, U.L. listed valve.
c. Check valve: cast iron flanged body, bronze fitted, non-slam type.
d. Install valves with stems upright or horizontal, not inverted.
e. Acceptable manufacturer:
- Nibco
- Grinnell
- Stockham
- Victaulic

4. Products:
a. All piping, fitting, equipment, sprinkler heads, and valves shall be by a domestic manufacturer.

PART 3 - EXECUTION

3.01 All equipment shall be installed in accordance with the manufacturer's recommendations and printed installation instructions.

3.02 All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items as required by NFPA and installed as per manufacturer's recommendations.

3.03 DESIGN

A. Design spacing of sprinkler heads and selection sizes shall conform to the requirement of

NFPA 13 for the indicated occupancy.

B. Uniform discharge density design shall be based on hydraulic calculations utilizing the method outlined in NFPA 13. Density of discharge from sprinkler heads shall conform to NFPA 13.

C. Friction losses in pipe will be based on a value of "C" =120 in the Hazen - Williams formula.

D. Design and install the system so that no part will interfere with doors, windows, heating, plumbing, or electrical equipment. Do not locate sprinkler heads within 6 inches of lighting fixtures, HVAC diffusers and other obstructions. Sprinkler piping cannot penetrate ductwork or lighting fixtures.

E. The Contractor shall conform to the National Fire Protection Association's Fire Code No. 13, latest edition. Special attention shall be given to Article 1-9, working plans. It shall be the Registered Fire Protection Engineer’s responsibility to determine if any deficiency or deviations, such as an inadequate water supply, or any other item which would materially affect the acceptability of the system.

## 3.04 INSTALLATION

A. Install all items in accordance with applicable codes.

B. Install piping so that mains and branches are not located directly underneath HVAC equipment or other items needing access.

C. All sprinkler heads shall be located as near the center of ceiling tiles as is practical (±1/2”). Location shall present a uniform pattern with all heads aligned when completely installed.

D. Run piping concealed above furred ceilings and in joists to minimize obstructions. Expose only heads. Exact routing of piping shall be approved by Architect or relocated as required at no additional cost to Owner.

E. Wire guards on all pendant or upright sprinklers heads in mechanical rooms, gymnasiums, athletic areas, wood and metal shops.

F. Protect sprinkler heads against mechanical injury with standard guards.

G. Locate outside alarms on wall of building adjacent to siamese fire department connection.

H. Provide on wall near sprinkler valve, cabinet containing four extra sprinkler heads of each type and wrench suitable for each head type.

I. Provide 1 inch diameter nipple and 1 inch x 1/2 inch reducing fitting for each upright head.

J. Painting shall be as follows:

1. Exposed sprinkler riser, alarm valve and all related piping shall be painted red.
2. Exposed sprinkler piping in finished areas shall be painted as directed by Architect.

3.05 REPLACEMENT

Upon receipt of written notice of failure of any part of the guaranteed equipment during the guaranteed period, the Contractor will replace the affected part or parts promptly at no additional cost.

3.06 TESTING

A. Prior to testing, the entire sprinkler system shall be thoroughly flushed clean.

B. Upon completion of the installation and flushing, test the system and obtain approval of the local fire insurance rating organization having jurisdiction. Particular attention is called to the requirements of NFPA 13 pamphlet.

3.07 TRAINING

A. Owner's people shall be fully briefed in the normal start-up of the system, operation, normal and emergency shutdown, and maintenance of the system.

B. Routine maintenance, yearly maintenance, winterization, and spring start-up shall be fully discussed and documented.

C. Names of those instructed and dates, as well as a list of information handed over to the owner, shall be included in the final report.

**END OF SECTION**

**SECTION 22 02 00 - BASIC MATERIALS AND METHODS**

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all Work herein.

B. The Contract Drawings indicate the extent and general arrangement of the systems. If any departure from the Contract Drawings is deemed necessary by the Contractor, details of such departure and the reasons therefore shall be submitted to the Architect/Engineer for approval as soon as reasonably practicable. No such departures shall be made without the prior written approval of the Architect/Engineer.

C. Notwithstanding any reference in the Specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, such reference shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgment of the Architect/Engineer, expressed in writing, is equal to that specified.

1.02 SCOPE OF WORK

A. The Work included under this Contract consists of the furnishing and installation of all equipment and material necessary and required to form the complete and functioning systems in all of their various phases, all as shown on the accompanying Drawings and/or described in these Specifications. The Contractor shall review all pertinent Drawings, including those of other contracts, prior to commencement of Work.

B. This Division requires the furnishing and installing of all items as specified herein, indicated on the Drawings, or reasonably inferred as necessary for safe and proper operation; including every article, device or accessory (whether or not specifically called for by item) reasonably necessary to facilitate each system's functioning as indicated by the design and the equipment specified. Elements of the work include, but are not limited to: materials, labor, supervision, transportation, storage, equipment, utilities, all required permits, licenses and inspections. All work performed under this Section shall be in accordance with the Project Manual, Drawings and Specifications and is subject to the terms and conditions of the Contract.

C. The approximate locations of Plumbing and Fire Protection items are indicated on the Drawings. These Drawings are not intended to give complete and accurate details with regards to location of outlets, apparatus, etc. Exact locations are to be determined by actual measurements at the building/job-site, and will in all cases be subject to the Review of the Owner or Engineer, who reserves the right to make any reasonable changes in the locations indicated without additional cost to the Owner.

D. Items specifically mentioned in the Specifications but not shown on the Drawings and/or items shown on Drawings but not specifically mentioned in the Specifications shall be

installed by the Contractor under the appropriate section of work as if they were both specified and shown.

E. All discrepancies between the Contract Documents and actual job-site conditions shall be reported to the Owner or Engineer so that they will be resolved prior to bidding. Where this cannot be done at least seven (7) working days prior to bid; the greater or more costly of the discrepancy shall be bid. All labor and materials required to perform the work described shall be included as part of this Contract.

F. It is the intention of this Section of the specifications to outline minimum requirements to furnish the Owner with a turn-key and fully operating system in cooperation with other trades.

G. It is the intent of the above "Scope" to give the Contractor a general outline of the extent of the Work involved; however, it is not intended to include each and every item required for the Work. Anything omitted from the "Scope" but shown on the Drawings, or specified elsewhere, or necessary for complete and functioning plumbing systems shall be considered a part of the overall "Scope".

H. The Contractor shall rough-in fixtures and equipment furnished by others from rough-in and placement drawings furnished by others. The Contractor shall make final connection to fixtures and equipment furnished by others.

I. The Contractor shall participate in the Commissioning process as required; including, but not necessarily limited to: meeting attendance, completion of checklists, and participation in functional testing.

1.03 SCHEMATIC NATURE OF CONTRACT DOCUMENTS

A. The contract documents are schematic in nature in that they are only to establish scope and a minimum level of quality. They are not to be used as actual working construction drawings. The actual working construction drawings shall be the reviewed Shop Drawings.

B. All piping, fixture, or equipment locations as indicated on the documents do not indicate every transition, offset, or exact location. All transitions, offsets, clearances and exact locations shall be established by actual field measurements, coordination with the structural, architectural and reflected ceiling plans, and other trades. Submit Shop Drawings for review.

C. All transitions, offsets and relocations as required by actual field conditions shall be performed by the Contractor at no additional cost to the owner.

D. Additional coordination with Electrical Subcontractor may be required to allow adequate clearances of electrical equipment, fixtures, and associated appurtenances. Contractor to notify Architect and Engineer of unresolved clearances, conflicts, or equipment locations.

1.04 SITE VISIT AND FAMILIARIZATION

A. Before submitting a bid, it will be necessary for each Contractor whose work is involved to visit the site and ascertain for himself the conditions to be met therein in installing his work and make due provision for same in his bid. It will be assumed that this Contractor in submitting his bid has visited the premises and that his bid covers all work necessary to properly install the piping, fixtures and equipment shown. Failure on the part of the Contractor to comply with this requirement shall not be considered justification for the omission or faulty installation of any work covered by these Specifications and Drawings.

B. Understand the existing utilities from which services will be supplied; verify locations of utility services, and determine requirements for connections.

C. Determine in advance that equipment and materials proposed for installation fit into the confines indicated.

1.05 WORK SPECIFIED IN OTHER SECTIONS

A. Finish painting is specified. Prime and protective painting is included in the work of this Division.

B. Owner and General Contractor furnished equipment shall be properly connected to plumbing systems.

C. Furnishing and installing all required plumbing equipment, control relays and electrical interlock devices, conduit, wire and junction boxes are included in the Work of this Division.

1.06 PERMITS, TESTS, INSPECTIONS

A. Arrange and pay for all permits, fees, tests, and all inspections as required by governmental authorities.

1.07 DATE OF FINAL ACCEPTANCE

A. The date of final acceptance shall be the date of Owner occupancy, or the date all punch list items have been completed, or the date final payment has been received. Refer to Division 01 for additional requirements.

B. The date of final acceptance shall be documented in writing and signed by the Architect, Owner and Contractor.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

B. Deliver products to the project at such times as the project is ready to receive the equipment, pipe or valves - properly protected from incidental damage and weather damage.

C. Damaged equipment, valves or pipe shall be promptly removed from the site and new, undamaged equipment, valves and pipe shall be provided in its place promptly with no additional charge to the Owner.

1.09 NOISE AND VIBRATION

A. The plumbing systems and the component parts thereof shall be guaranteed to operate without objectionable noise and vibration.

B. Provide foundations, supports and isolators as specified or indicated, properly adjusted to prevent transmission of vibration to the building structure, piping and other items.

C. Carefully fabricate pipe and fittings with smooth interior finish to prevent turbulence and generation or regeneration of noise.

D. All equipment shall be selected to operate with minimum of noise and vibration. If, in the opinion of the Architect/Engineer, objectionable noise or vibration is produced or transmitted to or through the building structure by equipment, piping or other parts of the Work, the Contractor shall rectify such conditions without extra cost to the Owner.

1.10 APPLICABLE CODES

A. Obtain all required permits and inspections for all work required by the Contract Documents and pay all required fees in connection thereof.

B. Arrange with the serving utility companies for the connection, relocation, and upgrade of all required utilities and pay all charges, meter charges, connection fees and inspection fees, if required.

C. Comply with all applicable codes, specifications, local ordinances, industry standards, utility company regulations and the applicable requirements of the following nationally accepted codes and standards, including, but not necessarily limited to:

1. American Standards Association, ASA.
2. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., ASHRAE.
3. American Society of Mechanical Engineers, ASME.
4. American Society of Plumbing Engineers, ASPE.
5. American Society of Testing Materials, ASTM.
6. American Water Works Association, AWWA.
7. National Bureau of Standards, NBS.
8. National Fire Protection Association, NFPA.
9. UL, LLC (formerly Underwriters Laboratories).
10. FM Global.
11. International Energy Conservation Code, IECC.
12. International Fire Code.
13. International Gas Code.

D. Where differences exist between the Contract Documents and applicable state or city building codes, state and local ordinances, industry standards, utility company regulations and the applicable requirements of the above listed nationally accepted codes and standards, the more stringent or costly application shall govern. Promptly notify the Architect/Engineer in writing of all differences.

E. When directed in writing by the Architect/Engineer, remove all work installed that does not comply with the Contract Documents and applicable state or city building codes, state and local ordinances, industry standards, utility company regulations and the applicable requirements of the above listed nationally accepted codes and standards. Correct the deficiencies and complete the work at no additional cost to the Owner.

1.11 DEFINITIONS AND SYMBOLS

A. General Explanation: A substantial amount of construction and Specification language constitutes definitions for terms found in other Contract Documents, including Drawings which must be recognized as diagrammatic and schematic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in Contract Documents are defined generally in this article, unless defined otherwise in Division 01.

B. Definitions and explanations of this Section are not necessarily either complete or exclusive, but are general for work to the extent not stated more explicitly in another provision of the Contract Documents.

C. Indicated: The term "Indicated" is a cross-reference to details, notes or schedules on the Drawings, to other paragraphs or schedules in the Specifications and to similar means of recording requirements in Contract Documents. Where such terms as "Shown", "Noted", "Scheduled", "Specified" and "Detailed" are used in lieu of "Indicated", it is for the purpose of helping the reader locate cross-reference material, and no limitation of location is intended except as specifically shown.

D. Directed: Where not otherwise explained, terms such as "Directed", "Requested", "Accepted", and "Permitted" mean by the Architect or Engineer. However, no such implied meaning will be interpreted to extend the Architect's or Engineer's responsibility into the Contractor's area of construction supervision.

E. Reviewed: Where used in conjunction with the Engineer's response to submittals, requests for information, applications, inquiries, reports and claims by the Contractor the meaning of the term "Reviewed" will be held to limitations of Architect's and Engineer's responsibilities and duties as specified in the General and Supplemental Conditions. In no case will "Reviewed" by Engineer be interpreted as a release of the Contractor from responsibility to fulfill the terms and requirements of the Contract Documents.

F. Furnish: Except as otherwise defined in greater detail, the term "Furnish" is used to mean supply and deliver new to the project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.

G. Install: Except as otherwise defined in greater detail, the term "Install" is used to describe operations at the project site including unloading, unpacking, assembly, erection, placing,

anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance.

H. Provide: Except as otherwise defined in greater detail, the term "Provide" is used to mean "Furnish and Install", complete and ready for intended use, as applicable in each instance.

I. Installer: Entity (person or firm) engaged by the Contractor or its Subcontractor for performance of a particular unit of work at the project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance. It is a general requirement that such entities (Installers) be expert in the operations they are engaged to perform.

J. Imperative Language: Used generally in Specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by the Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or when so noted by other identified installers or entities.

K. Minimum Quality/Quantity: In every instance, the quality level or quantity shown or specified is intended as minimum quality level or quantity of work to be performed or provided. Except as otherwise specifically indicated, the actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable tolerance limits. In complying with requirements, indicated or scheduled numeric values are either minimums or maximums as noted or as appropriate for the context of the requirements. Refer instances of uncertainty to Owner or Engineer via a request for information (RFI) for decision before proceeding.

L. Abbreviations and Symbols: The language of Specifications and other Contract Documents including Drawings is of an abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self-explanatory nature have been included in text of Specifications and Drawings. Specific abbreviations and symbols have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of Specification requirements with notations on Drawings and in Schedules. These are frequently defined in Section at first instance of use or on a Legend and Symbol Drawing. Trade and industry association names and titles of generally recognized industry standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of Contract Documents so indicate. Except as otherwise indicated, graphic symbols and abbreviations used on Drawings and in Specifications are those recognized in construction industry for indicated purposes. Where not otherwise noted symbols and abbreviations are defined by 2009 ASHRAE Fundamentals Handbook, chapter 34 "Abbreviations and Symbols", ASME and ASPE published standards.

## 1.12 DRAWINGS AND SPECIFICATIONS

A. These Specifications are intended to supplement the Drawings. It will not be the province of the Specifications to mention any part of the work which the Drawings are competent

to fully explain in every particular and such omission shall not to relieve the Contractor from carrying out portions indicated on the Drawings only.

B. Should items be required by these Specifications and not indicated on the Drawings, they are to be supplied even if of such nature that they could have been indicated thereon. In case of disagreement between Drawings and Specifications, or within either Drawings or Specifications, the better quality or greater quantity of work shall be estimated and the matter referred to the Architect or Engineer for review with a request for information and clarification at least seven (7) working days prior to bid opening date for issuance of an addendum.

C. The listing of product manufacturers, materials and methods in the various sections of the Specifications, and indicated on the Drawings, is intended to establish a standard of quality only. It is not the intention of the Owner or Engineer to discriminate against any product, material or method that is equal to the standards as indicated and/or specified, nor is it intended to preclude open, competitive bidding. The fact that a specific manufacturer is listed as an acceptable manufacturer should not be interpreted to mean that the manufacturers' standard product will meet the requirements of the project design, Drawings, Specifications and space constraints.

D. The Architect or Engineer and Owner shall be the sole judge of quality and equivalence of equipment, materials and methods.

E. Products by other reliable manufacturers, other materials, and other methods, will be accepted as outlined, provided they have equal capacity, construction, and performance. However, under no circumstances shall any substitution by made without the written permission of the Architect or Engineer and Owner. Request for prior approval must be made in writing at least ten (10) days prior to the bid date without fail.

F. Wherever a definite product, material or method is specified and there is not a statement that another product, material or method will be acceptable, it is the intention of the Owner or Engineer that the specified product, material or method is the only one that shall be used without prior approval.

G. Wherever a definite material or manufacturer's product is specified and the Specification states that products of similar design and equal construction from the specified list of manufacturers may be substituted, it is the intention of the Owner or Engineer that products of manufacturers that are specified are the only products that will be acceptable and that products of other manufacturers will not be considered for substitution without approval.

H. Wherever a definite product, material or method is specified and there is a statement that "OR EQUAL" product, material or method will be acceptable, it is the intention of the Owner or Engineer that the specified product, material or method or an "OR EQUAL" product, material or method may be used if it complies with the specifications and is submitted for review to the Engineer as outline herein.

I. Where permission to use substituted or alternative equipment on the project is granted by the Owner or Engineer in writing, it shall be the responsibility of the Contractor or

Subcontractor involved to verify that the equipment will fit in the space available which includes allowances for all required Code and maintenance clearances, and to coordinate all equipment structural support, plumbing and electrical requirements and provisions with the Mechanical and Plumbing Design Documents and all other trades, including Division 26.

J. Changes in architectural, structural, electrical, mechanical, and plumbing requirements for the substitution shall be the responsibility of the bidder wishing to make the substitution. This shall include the cost of redesign by the affected designer(s). Any additional cost incurred by affected Subcontractors shall be the responsibility of this bidder and not the Owner.

K. If any request for a substitution of product, material or method is rejected, the Contractor will automatically be required to furnish the product, material or method named in the Specifications. Repetitive requests for substitutions will not be considered.

L. The Owner or Engineer will investigate all requests for substitutions when submitted in accordance with above and if accepted, will issue a written acceptance allowing the substitutions.

M. Where equipment other than that used in the design as specified or shown on the Drawings is substituted (either from an approved manufacturers list or by submittal review), it shall be the responsibility of the substituting Contractor to coordinate space requirements, building provisions and connection requirements with his trades and all other trades and pay all additional costs to other trades, the Owner, the Architect or Engineer, if any, due to the substitutions.

1.13 SUBMITTALS

A. Coordinate with Division 01 for submittal timetable requirements, unless noted otherwise within thirty (30) days after the Contract is awarded. The Contractor shall submit an electronic copy of a complete set of Shop Drawings and complete data covering each item of equipment or material. The submittal of each item requiring a submittal must be received by the Architect or Engineer within the above thirty (30) day period. The Architect or Engineer shall not be responsible for any delays or costs incurred due to excessive Shop Drawing review time for submittals received after the thirty (30) day time limit. The Architect and Engineer will retain a copy of all Shop Drawings for their files. All literature pertaining to items subject to Shop Drawing submittal shall be submitted at one time. Submittals shall be placed in one electronic file in PDF 8.0 format and bookmarked for individual specification sections. Individual electronic files of submittals for individual specifications shall not be permitted. Each submittal shall include the following items:

1. A cover sheet with the names and addresses of the Project, Architect, MEP Engineer, General Contractor and the Subcontractor making the submittal. The cover sheet shall also contain the section number covering the item or items submitted and the item nomenclature or description.
2. An index page with a listing of all data included in the Submittal.

3. A list of variations page with a listing all variations, including unfurnished or additional required accessories, items or other features, between the submitted equipment and the specified equipment. If there are no variations, then this page shall state "NO VARIATIONS". Where variations affect the work of other Contractors, then the Contractor shall certify on this page that these variations have been fully coordinated with the affected Contractors and that all expenses associated with the variations will be paid by the submitting Contractor. This page will be signed by the submitting Contractor.
4. Equipment information including manufacturer's name and designation, size, performance and capacity data as applicable. All applicable Listings, Labels, Approvals and Standards shall be clearly indicated.
5. Dimensional data and scaled drawings as applicable to show that the submitted equipment will fit the space available with all required Code and maintenance clearances clearly indicated and labeled at a minimum scale of 1/4" = 1'-0", as required to demonstrate that the alternate or substituted product will fit in the space available.
6. Identification of each item of material or equipment matching that indicated on the Drawings.
7. Sufficient pictorial, descriptive and diagrammatic data on each item to show its conformance with the Drawings and Specifications. Any options or special requirements or accessories shall be so indicated. All applicable information shall be clearly indicated with arrows or another approved method.
8. Additional information as required in other Sections of this Division.
9. Certification by the General Contractor and Subcontractor that the material submitted is in accordance with the Drawings and Specifications, signed and dated in long hand. Submittals that do not comply with the above requirements shall be returned to the Contractor and shall be marked "REVISE AND RESUBMIT".

B. Refer to Division 00 and Division 01 for additional information on Shop Drawings and submittals.

C. Equipment and materials submittals and Shop Drawings will be reviewed for compliance with design concept only. It will be assumed that the submitting Contractor has verified that all items submitted can be installed in the space allotted. Review of Shop Drawings and submittals shall not be considered as a verification or guarantee of measurements or building conditions.

D. Where Shop Drawings and submittals are marked "REVIEWED", the review of the submittal does not indicate that submittals have been checked in detail nor does it in any way relieve the Contractor from his responsibility to furnish material and perform work as required by the Contract Documents.

E. Shop Drawings shall be reviewed and returned to the Contractor with one of the following categories indicated:

1. REVIEWED: Contractor need take no further submittal action, shall include this submittal in the O&M manual and may order the equipment submitted on.

2. REVIEWED AS NOTED: Contractor shall submit a letter verifying that required exceptions to the submittal have been received and complied with including additional accessories or coordination action as noted, and shall include this submittal and compliance letter in the O&M manual. The Contractor may order the equipment submitted on at the time of the returned submittal providing the Contractor complies with the exceptions noted.
3. NOT APPROVED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is not approved, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or Drawings. Contractor shall not order equipment that is not approved. Repetitive requests for substitutions will not be considered.
4. REVISE AND RESUBMIT: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked revise and resubmit, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or provide as noted on previous Shop Drawings. Contractor shall not order equipment marked revise and resubmit. Repetitive requests for substitutions will not be considered.
5. CONTRACTOR'S CERTIFICATION REQUIRED: Contractor shall resubmit submittal on material, equipment or method of installation. The Contractor's stamp is required stating the submittal meets all conditions of the contract documents. The stamp shall be signed by the General Contractor. The submittal will not be reviewed if the stamp is not placed and signed on all Shop Drawings.
6. MANUFACTURER NOT AS SPECIFIED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked manufacturer not as specified, the Contractor will automatically be required to furnish the product, material or method named in the specifications. Contractor shall not order equipment where submittal is marked manufacturer not as specified. Repetitive requests for substitutions will not be considered.

F. Materials and equipment which are purchased or installed without Shop Drawing review shall be at the risk of the Contractor and the cost for removal and replacement of such materials and equipment and related work which is judged unsatisfactory by the Owner or Engineer for any reason shall be at the expense of the Contractor. The responsible Contractor shall remove the material and equipment noted above and replace with specified equipment or material at his own expense when directed in writing by the Architect or Engineer.

G. Shop Drawing Submittals shall be complete and checked prior to submission to the Engineer for review.

H. Submittals are required for, but not necessarily limited to, the following items:

1. Basic Materials.
2. Plumbing Fixtures and Valves.
3. Supports and Carriers.
4. Floor Drains, Roof Drains, and Cleanouts.

5. Interceptors/Traps (All Types).
6. Water Heaters and Boilers.
7. Expansion Tanks.
8. Water Softeners.
9. Water Treatment Equipment.
10. Water Filters.
11. Domestic Water Booster Pumps.
12. Fire Pumps and Jockey Pumps.
13. Storm, Sanitary, and Wastewater Pumps and Ejectors.
14. Fire Pump and Jockey Pump Controllers.
15. Domestic Water and Fire Protection Break Tanks.
16. Backflow Preventers.
17. Plumbing Piping.
18. Piping, Vessel, and Equipment Insulation.
19. Air Compressors and Air Dryers.
20. Expansion Fittings and Devices.
21. Variable Frequency Drives.
22. Noise and Vibration Controls.
23. Pipe and Equipment Hangers and Supports.
24. Plumbing Specialties.
25. Test, Adjust and Balance Reports.
26. Testing, Adjusting and Balancing Contractor Qualifications.
27. Coordination Drawings.

I. Refer to other Division 22 sections for additional Shop Drawing and submittal requirements. Provide samples of actual materials and/or equipment to be used on the Project upon request of the Owner or Engineer.

1.14 COORDINATION DRAWINGS

A. Prepare coordination drawings to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of plumbing equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:

1. Indicate the proposed locations of pipe, equipment, and other materials. Include the following:
   a. Wall locations and types.
   b. Clearances for installing and maintaining insulation.
   c. Locations of light fixtures and sprinkler heads.
   d. Clearances for servicing and maintaining equipment, including tube removal and space for equipment disassembly required for periodic maintenance.
   e. Equipment connections and support details.
   f. Exterior wall and foundation penetrations.
   g. Routing of storm, sanitary sewer piping and plumbing piping.
   h. Fire-rated wall and floor penetrations.

i. Sizes and location of required concrete pads and bases.
j. Valve stem movement.
k. Structural floor, wall and roof opening sizes and details.

2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.

B. This Contractor shall be responsible for coordination of all items that will affect the installation of the work of this Division. This coordination shall include, but not be limited to: voltage, ampacity, capacity, electrical and piping connections, space requirements, sequence of construction, building requirements and special conditions.

C. By submitting Shop Drawings on the project, this Contractor is indicating that all necessary coordination has been completed and that the systems, products and equipment submitted can be installed in the building and will operate as specified and intended, in full coordination with all other Contractors and Subcontractors.

1.15 RECORD DOCUMENTS

A. Prepare Record Documents in accordance with the requirements of Division 00 and Division 01, in addition to the requirements specified in Division 22.

B. The Contractor shall maintain a separate set of clearly and legibly marked Record Drawings on the job site to record all changes and modifications, including, but not limited to the following: work details, alterations to meet site conditions, and changes made by "Change Order" notices. Mark the drawings with colored pencil(s). These shall be available for review by the Owner, Architect or Engineer during the entire construction stage.

C. The Record Drawings shall be updated concurrently as construction progresses, and in no case less frequently than a daily basis. They shall indicate accurate dimensions for all buried or concealed work; precise locations of all concealed pipe; locations of all valves, controls and operable devices; and any deviations from the work shown on the Construction Documents. All dimensions shall include at least two dimensions to permanent structure points.

D. Record Drawings shall indicate, at a minimum, the following installed conditions:

1. Mains and branches of piping systems, with valves and control devices located and numbered, unions located, and with items requiring maintenance located (i.e., traps, strainers, expansion fittings, tanks, etc.). Valve location diagrams, complete with valve tag chart. Indicate actual inverts and horizontal locations of underground piping.
2. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
3. Approved substitutions, Contract Modifications, and actual equipment and materials installed.
4. Contract Modifications, actual equipment and materials installed.

E. Engage the services of a Land Surveyor or Professional Engineer registered in the state in which the project is located as specified herein to record the locations and invert elevations of underground installations.

F. If the Contractor does not keep an accurate set of Record Documents, the pay request may be altered or delayed at the request of the Architect. Delivery of Record Documents is a condition of final acceptance. Record Drawings shall be furnished in addition to Shop Drawings.

G. Upon completion of the Work, the Contractor shall submit three (3) full size sets of Record Drawing prints to the Architect or Engineer for review prior to scheduling the final inspection at the completion of the work. The drawings shall have the name(s) and seal(s) of the Engineer(s) removed or blanked out and shall be clearly marked and signed on each sheet as follows:

CERTIFIED RECORD DRAWINGS

DATE:

(NAME OF GENERAL CONTRACTOR)

BY:_____
(SIGNATURE)

(NAME OF SUBCONTRACTOR)

BY:_____
(SIGNATURE)

1.16 CERTIFICATIONS AND TEST REPORTS

A. Submit a detailed schedule for completion and testing of each system indicating scheduled dates for completion of system installation and outlining tests to be performed and scheduled dates for each test. This detailed completion and test schedule shall be submittal at least ninety (90) days before the projected Project completion date.

B. Test result reporting forms shall be submitted for review no later than the date of the detailed schedule submitted.

C. Submit four (4) copies of all certifications and test reports to the Architect or Engineer for review adequately in advance of completion of the Work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.

D. Certifications and test reports to be submitted shall include, but not be limited to those items outlined in other Sections of Division 22.

1.17 OPERATIONS AND MAINTENANCE MANUALS

A. Prepare Operations and Maintenance manuals in accordance with the requirements of Division 01 and Division 22. In addition to the requirements of other Sections, this shall include the following information for fixtures, specialties, and equipment items:

1. Identifying names, name tags designations and locations for all equipment.
2. Valve tag lists with valve number, type, color coding, location and function.
3. Reviewed Shop Drawing submittals with exceptions noted compliance letter.
4. Fabrication drawings.
5. Equipment and device bulletins and data sheets clearly highlighted to show equipment installed on the project and including performance curves and data as applicable, i.e., description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and model numbers of replacement parts.
6. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
7. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
8. Servicing instructions and lubrication charts and schedules.
9. Equipment and motor name plate data.
10. Wiring diagrams.
11. Exploded parts views and parts lists for all equipment and devices.
12. Color coding charts for all painted equipment and conduit.
13. Location and listing of all spare parts and special keys and tools furnished to the Owner.
14. Furnish recommended lubrication schedule for all required lubrication points with listing of type and approximate amount of lubricant required.

B. Coordinate with Division 01 for Operations and Maintenance manual requirements. Unless noted otherwise, bind together in “D ring type” binders by National model no. 79-883 or equal, binders shall be large enough to allow ¼” of spare capacity. Three (3) sets of all approved Shop Drawing submittals, fabrication drawings, bulletins, maintenance instructions, operating instructions and parts exploded views and lists for each and every piece of equipment furnished under this Specification. All sections shall be typed and indexed into sections and labeled for easy reference and shall utilize the individual specification section numbers shown in the Plumbing Specifications as an organization guideline. Bulletins containing information about equipment that is not installed on the project shall be properly marked up or stripped and reassembled. All pertinent information required by the Owner for proper operation and maintenance of equipment supplied by Division 22 shall be clearly and legibly set forth in memoranda that shall, likewise, be bound with bulletins.

C. Operating and Maintenance Manuals shall be turned over to the Owner or Engineer for review a minimum of fourteen (14) working days prior to the beginning of the operator training period.

D. Operating and Maintenance Manuals which the Engineer deems incomplete, poorly organized, or otherwise unacceptable will be rejected in writing. The Contractor will subsequently be required to again turn over Operating and Maintenance Manuals, with all deficiencies corrected, until deemed acceptable by the Engineer.

## 1.18 OPERATOR TRAINING

A. The Contractor shall furnish the services of factory trained specialists to instruct the Owner's operating personnel. The Owner's operator training shall include a minimum of 12 hours of on- site training in three (3) shifts of four (4) hours each.

B. Before proceeding with the instruction of Owner’s Personnel, prepare a typed outline in triplicate, listing the subjects that will be covered in this instruction, and submit the outline for review by the Owner. At the conclusion of the instruction period, obtain the signature of each person being instructed on each copy of the reviewed outline to signify that he or she has a proper understanding of the operation and maintenance of the systems and then resubmit the signed outlines.

C. Refer to other Sections of Division 22 for additional Operator Training requirements.

## 1.19 FINAL COMPLETION

A. At the completion of the work, all equipment, operable appurtenances, and systems shall be tested. All faulty equipment and material shall be repaired or replaced. Refer to other Sections of Division 22 for additional requirements.

B. Clean and adjust all fixtures, flushometers, valves and operable devices. Replace faulty or otherwise damaged parts immediately prior to final acceptance.

C. Touch up and/or refinish any scratched equipment and devices immediately prior to final acceptance. This shall be acceptable **only for minor superficial scratches**, the determination of which rests solely on the judgment of the Architect or Engineer.

## 1.20 CONTRACTOR'S GUARANTEE

A. Use of the Plumbing systems to provide temporary service during the construction period shall not be allowed without written permission from the Owner, and, if granted, shall not be cause for the warranty period to start, except as defined below.

B. Contractor shall guarantee to keep the entire installation in repair and perfect working order for a period of one (1) year after its completion and final acceptance, and shall furnish free of additional cost to the Owner all materials and labor necessary to comply with the above guarantee throughout the year beginning from the date of issue of Substantial Completion, Beneficial Occupancy by the Owner, or the Certificate of Final Payment as agreed upon by all parties.

C. This guarantee shall not include cleaning or changing filters except as required by testing, adjusting and balancing.

D. Refer to other Sections of Division 22 for additional guarantee or warranty requirements.

1.21 TRANSFER OF ELECTRONIC FILES

A. Project documents are not intended or represented to be suitable for re-use by Architect/Owner or others on extensions of this project or on any other project. Any such re-use or modification without written verification or adaptation by Engineer, as appropriate for the specific purpose intended, will be at Architect/Owner's risk and without liability or legal exposure to Engineer or its consultants from all claims, damages, losses and expense, including attorney's fees arising out of or resulting thereof.

B. Because data stored in electric media format can deteriorate or be modified inadvertently, or otherwise without authorization of the data's creator, the party receiving the electronic files agrees that it will perform acceptance tests or procedures within sixty (60) days of receipt, after which time the receiving party shall be deemed to have accepted the data thus transferred to be acceptable. Any errors detected within the sixty (60) day acceptance period will be corrected by the party delivering the electronic files. Engineer is not responsible for maintaining documents stored in electronic media format after acceptance by the Architect/Owner.

C. When transferring documents in electronic media format, Engineer makes no representations as to the long-term compatibility, usability or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by Engineer at the beginning of the Project.

D. Any re-use or modifications will be Contractor's sole risk and without liability or legal exposure to Architect, Engineer or any consultant.

E. The Texas Board of Architectural Examiners (TBAE) has stated that it is in violation of Texas law for persons other than the Architect of record to revise the Architectural drawings without the Architect's written consent.

1. It is agreed that "MEP" hard copy or computer-generated documents will not be issued to any other party except directly to the Architect/Owner. The Contract Documents are contractually copyrighted and cannot be used for any other project or purpose except as specifically indicated in AIA B-141 Standard Form of Agreement Between Architect and Owner.
2. If the client, Architect/Owner, or developer of the project requires electronic media for "record purposes", then an AutoCAD based compact disc ("CD") will be prepared. The "CD" will be submitted with all title block references intact and will be formatted in a "plot" format to permit the end user to only view and plot the drawings. Revisions will not be permitted in this configuration.

E. At the Architect/Owner's request, Engineer will prepare one "CD" of electronic media to assist the Contractor in the preparation of submittals. The Engineer will prepare and submit the "CD" to the Architect/Owner for distribution to the Contractor.

1. The “CD” will be prepared and all title blocks, names and dates will be removed. The “CD” will be prepared in a “.dwg” format to permit the end user to revise the drawings.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Provide materials and equipment manufactured by a domestic United States manufacturer and assembled in the United States for all local and Federal Government projects. These materials and equipment shall comply with “Buy American Act.”

B. Access Doors: Provide access doors as required for access to equipment, valves, controls, cleanouts and other apparatus where concealed. Access doors shall have concealed hinges and screw driver cam locks unless indicated otherwise.

C. All access panels located in wet areas such as toilet rooms, locker rooms, shower rooms, natatoriums, kitchens, and any other wet areas shall be constructed of stainless steel.

D. Access doors shall be as follows:

1. Plastic Surfaces: Milcor Style K.
2. Ceramic Tile Surfaces: Milcor Style M.
3. Drywall Surfaces: Milcor Style DW.
4. Install panels only in locations approved by the Architect.

2.02 EQUIPMENT PADS

A. Provide four (4) inch high concrete pads for indoor floor mounted equipment. Pads shall conform to the shape of the equipment with a minimum extension of six (6) inches beyond the equipment. Top and sides of pads shall be troweled to a smooth finish, equivalent to the floor. External corners shall be bull-nosed to a 3/4" radius, unless shown otherwise.

B. Provide six (6) inch high concrete pads for all exterior mounted equipment. Pads shall conform to the shape of the equipment with a minimum extension of six (6) inches beyond the equipment. Provide a four (4) foot monolithic extension to the pad in front of the equipment for service when mounted on a non-finished area (i.e. landscape, gravel, clay, etc.) Top and sides of pads shall be troweled to a smooth finish. External corners shall be bull-nosed to a 3/4" radius, unless shown otherwise.

PART 3 - EXECUTION

3.01 ROUGH-IN

A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected via reviewed submittals.

B. Refer to equipment specifications in other Divisions (10, 11, 12, 13, 21, 22, etc.) for additional rough-in requirements as necessary and provide accordingly.

3.02 PLUMBING INSTALLATIONS

A. General: Sequence, coordinate, and integrate the various elements of plumbing and fire systems, materials, and equipment. Comply with the following requirements:

1. Coordinate plumbing and fire protection systems, equipment, and materials installation with other building components.
2. Verify all dimensions by field measurements.
3. Arrange for chases, slots, leave-outs, and other openings in building components during progress of construction to allow for plumbing installations.
4. Coordinate the installation of required supporting devices, sleeves, and pathways to be set in poured-in-place concrete and other structural components, as they are constructed.
5. Sequence, coordinate, and integrate installations of plumbing materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
7. Coordinate connection of plumbing and fire protection systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
8. Install systems, materials, and equipment to conform with architectural action markings on submittal, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, resolve conflicts and submit proposed solution to the Architect for review.
9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
10. Install equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location and label.
11. Install access panels or doors where valves, operable devices, and equipment are concealed behind finished surfaces. Refer to Article 2.01 of this Section and to Architectural documents for specifications and locations.
12. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.
13. Provide roof curbs for all roof mounted equipment. Coordinate with roof construction for pitched roof. Provide roof curb to match roof slope. Refer to architectural drawings and details.
14. The equipment to be furnished under this Specification shall be essentially the standard product of the manufacturer. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer;

however, the component parts of the system need not be the product of the same manufacturer.

15. The architectural and structural features of the building and the space limitations shall be considered in selection of all equipment. No equipment shall be furnished which will not suit the arrangement and space limitations indicated.
16. Lubrication: Prior to start-up, check and properly lubricate all bearings as recommended by the manufacturer.
17. Where the word "Concealed" is used in these Specifications in connection with insulating, painting, piping, valves, etc., it shall be understood to mean hidden from sight as in chases, furred spaces or suspended ceilings. "Exposed" shall be understood to mean the opposite of concealed.
18. Identification of Plumbing Equipment:
    a. Plumbing equipment shall be identified by means of nameplates permanently attached to the equipment. Nameplates shall be engraved laminated plastic or etched metal. Shop Drawings shall include dimensions and lettering format for approval. Attachments shall be with escutcheon pins, self-tapping screws, or machine screws.
    b. Tags shall be attached to all valves, including control valves, with nonferrous chains. Tags shall be brass and at least 1-1/2 inches in diameter. Nameplate and tag symbols shall correspond to the identification symbols on the Record Drawings.

## 3.03 CUTTING AND PATCHING

A. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.

B. Perform cutting, fitting, and patching of plumbing equipment and materials required to:

1. Uncover Work to provide for installation of ill-timed Work.
2. Remove and replace defective Work.
3. Remove and replace Work not conforming to requirements of the Contract Documents.
4. Remove samples of installed Work as specified for testing.
5. Install equipment and materials in existing structures.
6. Upon written instructions from the Engineer, uncover and restore Work to provide for Engineer/Owner's observation of concealed Work, without additional cost to the Owner.
7. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers; refer to the materials and methods required for the surface and building components being patched; Refer to Article 1.11 DEFINITIONS AND SYMBOLS for definition of "Installer."

C. Cut, remove and legally dispose of selected plumbing equipment, components, and materials as indicated, including but not limited to removal of plumbing piping, equipment, plumbing fixtures and trim, and other plumbing items made obsolete by the new Work.

D. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.

E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

3.04 WORK SEQUENCE, TIMING, COORDINATION WITH OWNER, ARCHITECT AND ENGINEER

A. The Owner will cooperate with the Contractor, however, the following provisions must be observed:

1. A meeting will be held at the project site, prior to any construction, between the Owner's Representative, the General Contractor, the Subcontractors and the Architect/Engineer to discuss Contractor's employee parking space, access, storage of equipment or materials, and use of the Owner's facilities or utilities. The Owner's decisions regarding such matters shall be final.
2. During the construction of this project, normal facility activities will continue in existing buildings until renovated areas are completed. Plumbing, fire protection, lighting, electrical, communications, heating, air conditioning, and ventilation systems will have to be maintained in service within the occupied spaces of the existing building.

B. Start-up for major plumbing and fire protection equipment shall be performed by a factory authorized technician. Such equipment shall include, but not necessarily be limited to, the following: domestic water boilers and packaged water heating systems, water softeners, ultra-pure water equipment systems, domestic water booster pumps, fire pumps, and break tank level alarm systems. Refer to other Sections of Divisions 21 and 22 for additional requirements.

3.05 DEMOLITION AND WORK WITHIN EXISTING BUILDINGS

A. In the preparation of these documents every effort has been made to show the approximate locations of, and connections to the existing piping, utilities, equipment and other apparatus related to this phase of the work. However, this Contractor shall be responsible for verifying all of the above information. This Contractor shall visit the existing site to inspect the facilities and related areas. This Contractor shall inspect and verify all details and requirements of all the Contract Documents, prior to the submission of a proposal. All discrepancies between the Contract Documents and actual job-site conditions shall be resolved by this Contractor, who shall produce drawings that shall be submitted to the Architect/Engineer for review. All labor and materials required to perform the work described shall be a part of this Contract.

B. All equipment and/or systems noted on the Drawings "To Remain" shall be inspected and tested on site to certify its working condition. A written report on the condition of all equipment to remain, including a copy of the test results and recommended remedial actions and costs shall be made by this Contractor to the Architect/Engineer for review.

C. All equipment and/or systems noted on the Drawings "To Be Removed" shall be removed including, associated pipe, supports, and hangers. Where pipe is to be capped for future or end of line use, it shall be properly tagged with its function or service appropriately identified. Where existing equipment is to be removed or relocated and has an electric motor or connection, the Electrical Contractor shall disconnect motor or connection, remove wiring to a safe point and this Contractor shall remove or relocate motor or connection along with the equipment.

D. Ensure existing piping and equipment to remain that is adjacent to and impacted by the scope of Work is properly supported, fastened, and secure.

E. During the construction and remodeling, portions of the Project shall remain in service. Construction equipment, material tools, extension cords, etc., shall be arranged so as to present minimum hazard or interruption to the occupants of the building. None of the construction work shall interfere with the proper operation of the existing facility or be so conducted as to cause harm or danger to persons on the premises. All fire exits, stairs or corridors required for proper access, circulation or exit shall remain clear of equipment, materials or debris. The General Contractor shall maintain barricades, other separations in corridors and other spaces where work is conducted.

F. Certain work during the demolition phase of construction may require overtime, night time, or weekend shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time with the Owner at least seventy-two (72) hours in advance in writing.

G. Any salvageable equipment as determined by the Owner, shall be delivered to the Owner, and placed in storage at the location of his choice. All other debris shall be removed from the site immediately and disposed of lawfully.

H. Equipment, piping or other potential hazards to the working occupants of the building or the general public shall not be left overnight outside of the designated working or construction area.

I. Make every effort to minimize damage to the existing building and the Owner's property. Repair, patch or replace as required any damage that occurs as a result of work at the site. Care shall be taken to minimize interference with the Owner's activities during construction and to keep construction disrupted areas to a minimum. Coordinate with the Owner and other trades in scheduling and performance of the work.

J. Include in the contract price all rerouting of existing pipe, utilities, etc., and the reconnecting of the existing equipment and plumbing fixtures as necessitated by field conditions to allow the installation of the new systems regardless of whether or not such rerouting, reconnecting or relocating is shown on the Drawings. Provide all temporary pipe, utilities, controls, etc., as required to maintain heating, cooling, ventilation and plumbing services for the existing areas with a minimum of interruption.

K. All existing plumbing fixtures, pipe, utilities, materials, equipment, controls and appurtenances not included in the remodel or alteration areas are to remain in place.

L. Pipe, utilities, equipment and controls serving mechanical, plumbing and owner's equipment, etc., which is to remain but which is served by pipe, utilities, equipment and controls that are disturbed by the remodeling work, shall be reconnected in such a manner as to leave this equipment in proper operating condition.

M. No portion of the **fire protection systems** shall be turned off, modified or changed in any way without the express knowledge and written permission of the Owner's representative in order to protect systems that shall remain in service.

N. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and operating system in cooperation with other trades with a minimum of disruption or downtime.

O. Refer to Architectural Demolition and/or Alteration plans for actual locations of walls, ceiling, etc., being removed and/or remodeled.

**END OF SECTION**

**SECTION 22 02 01 - COORDINATION DRAWINGS**

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions 013100 and Supplementary Conditions apply to all Work herein.

1.02 COORDINATION DRAWINGS

A. The Mechanical Contractor shall take the lead in coordinating the Mechanical, Electrical, Plumbing, and Fire Protection systems within the building.

B. The Mechanical Contractor shall coordinate a three dimensional (3D) model of the building which includes the Mechanical, Electrical, Plumbing, and Fire Protection systems. The Electrical, Plumbing, and Fire Protection Contractors shall prepare their work and generate 3D models which will be given to the Mechanical Contractor for coordination. The Contractor will be provided with the REVIT model that was used to generate the contract documents, this file may be used as the background file. The Contractor shall replace the systems drawn with the actual shop drawing models. The Contractor is not limited to using REVIT, but may use any 3-D software in generating and combining the coordination model.

C. Submitting the contract drawings as coordination drawings will not be acceptable.

D. The model shall include detailed and accurate representations of all equipment to be installed based upon the reviewed equipment submittals.

E. The Mechanical Contractor shall hold a 3-D coordination meeting with all sub-contractors present to review the model and discuss coordination of the installation of the building systems.

F. Upon completion of the coordination meeting, the Contractor shall submit the 3-D model and ¼" scale drawings for review.

G. The model shall detail major elements, components, and systems in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:

1. Indicate the proposed locations of pipe, duct, equipment, and other materials. Include the following:

   a. Wall and type locations.

   b. Clearances for installing and maintaining insulation.

   c. Locations of light fixtures and sprinkler heads.

   d. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.

   e. Equipment connections and support details.

   f. Exterior wall and foundation penetrations.

   g. Routing of storm and sanitary sewer piping.

h. Fire-rated wall and floor penetrations.

i. Sizes and location of required concrete pads and bases.

j. Valve stem movement.

k. Structural floor, wall and roof opening sizes and details.

2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.

3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.

4. Prepare reflected ceiling plans to coordinate and integrate installations, air distribution devices, light fixtures, communication systems components, and other ceiling-mounted items.

A. Sequence of Coordination

Below is hierarchy of model elements and the sequencing by which the models will be coordinated.

1. Structural and Architectural model
2. Miscellaneous steel
3. Perform preliminary space allocation
4. Identify hard constraints (locations of access panels, lights, A/V space requirements, etc.)
5. Main and medium pressure ducts from the shaft out
6. Main graded plumbing lines and vents
7. Sprinkler mains and branches
8. Cold and hot water mains and branches
9. Lighting fixtures and plumbing fixtures
10. Smaller sized ducts and flex ducts
11. Smaller size cold water and hot water piping, flex ducts, etc.

B. The Contractor and Sub-Contractors shall not install any item until the coordination has been completed and reviewed by the Construction Manager, Owner, and A/E team.

C. This Contractor shall be responsible for coordination of all items that will affect the installation of the work of this Division. This coordination shall include, but not be limited to: voltage, ampacity, capacity, electrical and piping connections, space requirements, sequence of construction, building requirements and special conditions.

D. By submitting shop drawings on the project, this Contractor is indicating that all necessary coordination has been completed and that the systems, products and equipment submitted can be installed in the building and will operate as specified and intended, in full coordination with all other Contractors and Subcontractors.

**END OF SECTION**

**SECTION 22 03 00 - PLUMBING DEMOLITION FOR REMODELING**

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Mechanical demolition.

B. The drawings do not show all demolition work required. The contractor shall make himself familiar with the required scope of work to accomplish the work required by these documents. All demolition work implied or required shall be included in the scope of this contract.

C. Outages of services as required by the new installation will be permitted but only at a time approved by the Owner. The contractor shall allow the Owner 2 weeks in order to schedule required outages. The time allowed for outages will not be during normal working hours unless otherwise approved by the Owner. All costs of outages, including overtime charges, shall be included in the contract amount.

1.02 RELATED SECTIONS

A. Section 01120 – Alteration Project Procedures.

B. Section 02072 – Minor Demolition for Remodeling.

1.03 WORK SEQUENCE, TIMING, COORDINATION WITH OWNER

A. The Owner will corporate with the Contractor, however, the following provisions must be observed:

1. During the construction of this project, normal facility activities will continue in existing buildings until new buildings or renovated areas are completed. Plumbing, fire protection, lighting, electrical, communications, heating, air conditioning, and ventilation systems will have to be maintained in service within the occupied spaces of the existing building.
2. A meeting will be held at the project site, prior to any construction, between the Owner's Representative, the General Contractor, the Sub-Contractors and the Engineer to discuss Contractor's employee parking space, access, storage of equipment or materials, and use of the Owner's facilities or utilities. The Owner's decisions regarding such matters shall be final.

1.04 DEMOLITION AND WORK WITHIN EXISTING BUILDINGS

A. In the preparation of these documents every effort has been made to show the approximate locations of, and connections to the existing piping, duct, equipment and other apparatus related to this phase of the work. However, this Contractor shall be responsible for verifying all of the above information. This Contractor shall visit the existing site to inspect the facilities and related areas. This Contractor shall inspect and verify all details and requirements of all the Contract Documents, prior to the submission of a proposal. All discrepancies between the Contract Documents and actual job-site

conditions shall be resolved by his contractor, who shall produce drawings which shall be submitted to the Architect/Engineer for review. All labor and materials required to perform the work described shall be a part of this Contract.

B. All equipment and/or systems noted on the Drawings "To Remain" shall be inspected and tested on site to certify its working condition. A written report on the condition of all equipment to remain, including a copy of the test results and recommended remedial actions and costs shall be made by this Contractor to the Architect/Engineer for review.

C. All equipment and/or systems noted on the Drawings "To Be Removed" should be removed including, associated pipe and duct pipe and duct hangers and/or line supports. Where duct or pipe is to be capped for future or end of line use, it shall be properly tagged with its function or service appropriately identified. Where existing equipment is to be removed or relocated and has an electric motor or connection, the Electrical Contractor shall disconnect motor or connection, remove wiring to a safe point and this Contractor shall remove or relocate motor or connection along with the equipment.

D. During the construction and remodeling, portions of the Project shall remain in service. Construction equipment, material tools, extension cords, etc., shall be arranged so as to present minimum hazard or interruption to the occupants of the building. None of the construction work shall interfere with the proper operation of the existing facility or be so conducted as to cause harm or danger to persons on the premises. All fire exits, stairs or corridors required for proper access, circulation or exit shall remain clear of equipment, materials or debris. The General Contractor shall maintain barricades, other separations in corridors and other spaces where work is conducted.

E. Certain work during the demolition and construction phases of construction may require overtime or night time shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time with the Project Administrator at least seventy-two (72) hours in advance in writing.

F. Any salvageable equipment as determined by the Owner, shall be delivered to the Owner, and placed in storage at the location of his choice. All other debris shall be removed from the site immediately.

G. Equipment, piping or other potential hazards to the occupants of the building shall not be left overnight outside of the designated working or construction area.

H. Make every effort to minimize damage to the existing building and the owner's property. Repair, patch or replace as required any damage which might occur as a result of work at the site. Care shall be taken to minimize interference with the Owner's activities during construction and to keep construction disrupted areas to a minimum. Corporate with the Owner and other trades in scheduling and performance of the work.

I. Include in the contract price all rerouting of existing pipe, duct, etc., and the reconnecting of the existing equipment and plumbing fixtures as necessitated by field conditions to allow the installation of the new systems regardless of whether or not such rerouting, reconnecting or relocating is shown on the drawings. Furnish all temporary pipe, duct, controls, etc., as required to maintain heating, cooling, ventilation and plumbing services for the existing areas with a minimum of interruption.

J. All existing plumbing fixtures, pipe, duct, materials, equipment, controls and appurtenances not included in the remodel or alteration areas are to remain in place.

K. Pipe, duct, equipment and controls serving mechanical, plumbing and owner's equipment, etc., which is to remain but which is served by pipe, duct, equipment and controls that are disturbed by the remodeling work, shall be reconnected in such a manner as to leave this equipment in proper operating condition.

L. No portion of the **fire protection systems** shall be turned off, modified or changed in any way without the express knowledge and written permission of the Owner's representative in order to protect systems that shall remain in service.

M. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and operating system in cooperation with other trades with a minimum of disruption or downtime.

N. Refer to Architectural "Demolition and/or Alteration" plans for actual location of walls, ceiling, etc., being removed and/or remodeled.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual Sections.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Field verify measurements and piping arrangements are as shown on Drawings.

B. Verify that abandoned piping and equipment serve only abandoned facilities.

C. Demolition Drawings are based on casual field observation and existing record documents. Report discrepancies to Owner before disturbing existing installation.

D. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

A. Disconnect plumbing systems in walls, floors, and ceilings scheduled for removal.

B. Coordinate utility service outages with Utility Company.

C. Provide temporary connections to maintain existing systems in service during construction. When work must be performed on energized equipment, use personnel experienced in such operations.

D. Existing Service: Maintain existing system in service until new system is complete and

ready for service. Disable system only to make switchovers and connections. Obtain permission from Owner at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

E. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Notify Owner and local fire service at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

3.03 DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK

A. Demolish and extend existing mechanical work under provisions of Section 01120, Section 02072, and this Section.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned piping to source of supply.

D. Remove exposed abandoned piping systems, including abandoned systems above accessible ceiling finishes. Cut systems flush with walls and floors, and patch surfaces.

E. Repair adjacent construction and finishes damaged during demolition and extension work.

F. Maintain access to existing installations which remain active. Modify installation or provide access panels as appropriate.

G. Extend existing installations using materials and methods compatible with existing installations, or as specified.

3.04 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment which remain or are to be reused.

3.05 INSTALLATION

A. Install relocated materials and equipment under the provisions of Section 01120.

3.06 REMOVAL OF MATERIALS

A. The contractor shall modify, remove, and/or relocate all materials and items so indicated on the drawings or required by the installation of new facilities. All removals and/or dismantling shall be conducted in a manner as to produce maximum salvage. Salvage materials shall remain the property of the Owner, and shall be delivered to such destination as directed by the Owner. Materials and/or items scheduled for relocation and which are damaged during dismantling or reassembly operations shall be repaired and restored to good operative condition. The contractor may, at his discretion and upon the approval of the Owner, substitute new materials and/or items of like design and quality in

lieu of materials and/or items to be relocated.

B. All items which are to be relocated shall be carefully removed in reverse to original assembly or placement and protected until relocated. The contractor shall clean and repair and provide all new materials, fittings, and appurtenances required to complete the relocations and to restore to good operative order. All relocations shall be performed by workmen skilled in the work and in accordance with standard practice of the trades involved.

C. When items scheduled for relocation are found to be in damaged condition before work has been started on dismantling, the contractor shall call the attention of the Owner to such items and receive further instructions before removal. Items damaged in repositioning operations are the contractor's responsibility and shall be repaired or replaced by the contractor as approved by the Owner, at no additional cost to the Owner.

D. Service lines and wiring to items to be removed, salvaged, or relocated shall be removed to points indicated on the drawings, specified, or acceptable to the Owner. Service lines and wiring not scheduled for reuse shall be removed to the points at which reuse is to be continued or service is to remain. Such services shall be sealed, capped, or otherwise tied-off or disconnected in a safe manner acceptable to the Owner. All disconnections or connections into the existing facilities shall be done in such a manner as to result in minimum interruption of services to adjacent occupied areas. Services to existing areas or facilities which must remain in operation during the construction period shall not be interrupted without prior specific approval of the Owner as hereinbefore specified.

E. Certain work during the demolition phase of construction may require overtime or nighttime shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time with the Owner's Representative at least 72 hours in advance.

F. Make every effort to minimize damage to the existing building and the Owner's property. Repair, patch, or replace as required any damage which might occur as a result of work at the site. Care shall be taken to minimize interference with the Owner's activities during construction. Cooperate with the Owner and other trades in scheduling and performance of the work.

G. Include in the contract price all rerouting of existing conduits, wiring, outlet boxes, fixtures, etc., and the reconnecting of existing fixtures as necessitated by field conditions to allow the installation of the new systems. Furnish all temporary conduit, wiring, boxes, etc., as required to maintain lighting and power service for the existing areas with a minimum of interruption. Remove wire and conduit back to nearest accessible active junction box and extend to existing homeruns as required.

H. The contractor shall be responsible for loss or damage to the existing facilities caused by him and his workmen, and shall be responsible for repairing such loss or damage. The contractor shall send proper notices, make necessary arrangements, and perform other services required for the care, protection and in-service maintenance of all electrical services for the new and existing facilities. The contractor shall erect temporary barricades, with necessary safety devices, as required to protect personnel from injury, removing all such temporary protection upon completion of the work.

I. Where existing construction is removed to provide working and extension access to existing utilities, contractor shall remove doors, piping, conduit, outlet boxes, wiring, light fixtures, air conditioning ductwork and equipment, etc., to provide this access and shall reinstall same upon completion of work in the areas affected.

J. Where partitions, walls, floors, or ceilings of existing construction are being removed, all contractors shall remove and reinstall in locations approved by the Architect all devices required for the operation of the various systems installed in the existing construction.

**END OF SECTION**

**SECTION 22 05 16 – EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING**

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Flexible pipe connections.

B. Expansion joints and compensators

C. Pipe loops, offsets, and swing joints.

1.02 RELATED WORK

A. Section 22 05 29 – Hangers and Support for Plumbing Piping and Equipment.

B. Section 22 10 00 – Plumbing Piping.

1.03 PERFORMANCE REQUIREMENTS

A. Provide structural work and equipment required to control expansion and contraction of piping. Verify that anchors, guides, and expansion joints provided, adequately protect system.

B. Expansion Calculations:

1. Installation Temperature: 50 degrees F (10 degrees C).
2. Hot Water Heating: 210 degrees F (99 degrees C).
3. Domestic Hot Water: 140 degrees F (60 degrees C).
4. Safety Factor: 30 percent.

C. Pipe sizes indicated are to establish a minimum quality of compensator. Refer to manufacturers' literature for model series for different pipe sizes.

1.04 SUBMITTALS

A. Submit shop drawings under provisions of Division One.

B. Product Data:

1. Flexible Pipe Connectors: Indicate maximum temperature and pressure rating, face-to-face length, live length, hose wall thickness, hose convolutions per foot (meter) and per assembly, fundamental frequency of assembly, braid structure, and total number of wires in braid.
2. Expansion Joints: Indicate maximum temperature and pressure rating, and maximum expansion compensation.

C. Design Data: Indicate selection calculations.

D. Manufacturer's Installation Instructions: Indicate special procedures, and external

controls.

1.05 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Division One.

B. Record actual locations of flexible pipe connectors, expansion joints, anchor, and guides.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Division One.

B. Maintenance Data: Include adjustment instructions.

1.07 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

B. Design expansion compensation system under direct supervision of a Professional Engineer experienced in design of this work and licensed in the state where the project is located.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, project and handle products to site under provisions of Division One.

B. Accept expansion joints on site in factory packing with shipping bars and positioning devices intact. Inspect for damage.

C. Protect equipment from exposure by leaving factory coverings, pipe end protection, and packaging in place until installation.

1.09 WARRANTY

A. Provide five year warranty under provisions of Division One.

B. Warranty: Include coverage for leak free performance of packed expansion joints.

1.10 EXTRA MATERIALS

A. Furnish under provisions of Division One.

PART 2 - PRODUCTS

2.01 FLEXIBLE PIPE CONNECTORS

A. Steel Piping (Based on 2" Pipe):

1. Manufacturers:

a. Amber/Booth Metal-Flex, Model Type SS-PM or FW
b. Triplex, Model Flexonics Series 400M
c. Mercer Rubber Company, Model BSS-EM (Mason Industries)

2. Inner Hose: Type 321, stainless steel, corrugated metal.
3. Exterior Sleeve: Type 321, single braided stainless steel.
4. Pressure Rating: 350 psig WOG and 70 degrees F. For 4 inch pipe - 200 psig WOG and 70 degrees F.
5. Joint: Schedule 40 steel, threaded with male nipple and hex boss each end and Union. Flanged joints for pipe sizes 2½ inch and larger.
6. Size: Use pipe sized units.
7. Maximum offset: 1/2 inch on each side of installed center line.
8. Application: Air handling units cooling and heating coils.

B. Copper Piping (Based on 2" Pipe):

1. Manufacturers:
a. Amber/Booth Metal-Flex, Model Type BR-SM
b. Triplex, Model Flexonics Series 300
c. Mercer Rubber Company, Type BFF (Mason Industries)
2. Inner Hose: Corrugated Bronze
3. Exterior Sleeve: Braided bronze.
4. Pressure Rating: 250 psig WOG and 70 degrees F.
5. Joint: Threaded with male nipple and hex boss each end with Union. Flanged joints for pipe sizes 2½ inch and larger.
6. Size: Use pipe sized units.
7. Maximum offset: 1/2 inch on each side of installed center line.
8. Application: Air handling units cooling and heating coils.

## 2.02 EXPANSION JOINTS

A. Bellows Type (Based on 4" Pipe):

1. Manufacturers:
a. Amber/Booth, Style EB
b. Triplex, Model Resistoflex R6905
c. Mercer Rubber Company, Style 803 or 805 (Mason Industries)
2. Body: Monel wire reinforced molded TFE teflon bellows, multiple arch.
3. Pressure Rating: 70 psig WSP and 250 degrees F (66 degrees C).
4. Maximum Compression: 1 inch.
5. Maximum Extension: 1 inch.
6. Maximum Offset: 1/2 inch.
7. Joint: ASA standard ductile iron flanges, integral molded gasket.
8. Size: Use pipe sized units.
9. Accessories: Control rod limit bolts.
10. Application: Steel piping 8 inch and under.

## 2.03 ACCESSORIES

A. Pipe Alignment Guides to Direct Axial Movement:

1. Manufacturers:

a. Triplex, Model Flexonics
b. Metraflex, Style II

2. Two piece welded steel with shop paint, bolted, with spider to fit standard pipe, frame with four mounting holes, clearance for minimum 1 inch thick insulation, minimum 3 inch travel.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Construct spool pieces to exact size of flexible connection for future insertion.

C. Install flexible pipe connectors on pipes connected to equipment supported by vibration isolation. Provided line size flexible connectors.

D. Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor other end. Install in horizontal plane unless indicated otherwise.

E. Provide miscellaneous metals to rigidly anchor pipe to building structure. Provide pipe guides so that movement takes place along axis of pipe only. Erect piping such that strain and weight is not on cast connections or apparatus.

F. Provide support and equipment required to control expansion and contraction of piping. Provide loops, pipe offsets, and swing joints, or expansion joints where required.

3.02 MANUFACTURER'S FIELD SERVICES

A. Prepare and start systems under provisions of Division One.

B. Provide inspection services by flexible pipe manufacturer's representative for final installing and certify installation is in accordance with manufacturer's recommendations and connectors are performing satisfactorily.

**END OF SECTION**

**SECTION 22 05 29 – HANGERS AND SUPPORT FOR PLUMBING PIPING AND EQUIPMENT**

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Pipe, and equipment hangers, supports, and associated anchors.

B. Sleeves and seals.

C. Flashing and sealing equipment and pipe stacks.

1.02 RELATED WORK

A. Section 22 05 29 – Hangers and Support for Plumbing Piping and Equipment.

B. Section 22 07 19 – Plumbing Piping Insulation.

C. Section 22 07 16 – Plumbing Equipment Insulation.

D. Section 21 00 00 - Fire Protection and 21 13 13 Wet Pipe Sprinkler System.

E. Section 22 10 00 - Plumbing System.

F. Section 23 21 13 – Above Ground Hydronic Piping.

G. Section 23 23 00 – Refrigerant Piping

1.03 REFERENCES

A. ANSI/ASME B31.1 - Power Piping.

B. NFPA 13 - Standard for the Installation of Sprinkler Systems.

C. NFPA 14 - Standard for the Installation of Standpipe and Hose Systems.

1.04 QUALITY ASSURANCE

A. Supports for Sprinkler Piping: In conformance with NFPA 13.

B. Supports for Standpipes: In conformance with NFPA 14.

1.05 SUBMITTALS

A. Submit shop drawings and product data under provisions of Division One.

B. Indicate hanger and support framing and attachment methods.

PART 2 - PRODUCTS

## 2.01 PIPE HANGERS AND SUPPORTS

A. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch Malleable iron, adjustable swivel, split ring.

B. Hangers for Pipe Sizes 2 to 4 Inches Carbon steel, adjustable, clevis.

C. Hangers for Pipe Sizes 6 Inches and Over: Adjustable steel yoke, cast iron roll, double hanger.

D. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods; cast iron roll and stand for pipe sizes 6 inches and over.

E. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.

F. Wall Support for Pipe Sizes 4 Inches and Over: adjustable steel yoke and cast iron roll.

G. Vertical Support: Steel riser clamp.

H. Floor Support for Pipe Sizes to 4 Inches: Cast iron adjustable pipe saddle, locknut nipple, floor flange, and concrete pier or steel support.

I. Floor Support for Pipe Sizes 6 Inches and Over: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.

J. Roof Pipe Supports and Hangers: Galvanized Steel Channel System as manufactured by Portable Pipe Hangers, Inc. or approved equal.

For pipes 2-1/2” and smaller – Type PP10 with roller
For pipes 3” through 8” – Type PS
For multiple pipes – Type PSE - Custom

K. Copper Pipe Support and Hangers: Electro-galvanized with thermoplastic elastomer cushions; Unistrut “Cush-A-Clamp” or equal. Hangers: Plastic coated; Unistrut or equal.

L. For installation of protective shields refer to specification section 22 07 19 -3.03.

M. Shields for Vertical Copper Pipe Risers: Sheet lead.

N. Pipe Rough-In Supports in Walls/Chases: Provide preformed plastic pipe supports, Sioux Chief “Pipe Titan” hold rite or equal.

## 2.02 HANGER RODS

A. Galvanized Hanger Rods: Threaded both ends, threaded one end, or continuous threaded.

## 2.03 INSERTS

A. Inserts: Malleable iron case of galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.04 FLASHING

A. Metal Flashing: 20 gage galvanized steel.

B. Lead Flashing: 4 lb./sq. ft. sheet lead for waterproofing; 1 lb./sq. ft. sheet lead for soundproofing.

C. Caps: Steel, 20 gage minimum; 16 gage at fire resistant elements.

D. Coordinate with roofing contractor/architect for type of flashing on metal roofs.

2.05 SLEEVES

A. Sleeves for Pipes Through Non-fire Rated Floors: Form with 18 gage galvanized steel, tack welded to form a uniform sleeve.

B. Sleeves for Pipes Through Non-fire Rated Beams, Walls, Footings, and Potentially Wet Floors: Form with steel pipe, schedule 40.

C. Sleeves for Pipes Through Fire Rated and Fire Resistive Floors and Walls, and Fireproofing: Prefabricated fire rated steel sleeves including seals, UL listed.

D. Sleeves for Round Ductwork: Form with galvanized steel.

E. Sleeves for Rectangular Ductwork: Form with galvanized steel.

F. Fire Stopping Insulation: Glass fiber type, non-combustible, U.L. listed.

G. Caulk: Paintable 25-year acrylic sealant.

H. Pipe Alignment Guides: Factory fabricated, of cast semi-steel or heavy fabricated steel, consisting of bolted, two-section outer cylinder and base with two-section guiding spider that bolts tightly to pipe. Length of guides shall be as recommended by manufacturer to allow indicated travel.

2.06 FABRICATION

A. Size sleeves large enough to allow for movement due to expansion and contraction. Provide for continuous insulation wrapping.

B. Design hangers without disengagement of supported pipe.

C. Design roof supports without roof penetrations, flashing or damage to the roofing material.

2.07 FINISH

A. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

PART 3 - EXECUTION

3.01 INSERTS

A. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams. Coordinate with structural engineer for placement of inserts.

B. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.

C. Where concrete slabs form finished ceiling, provide inserts to be flush with slab surface.

D. Where inserts are omitted, drill through concrete slab from below and provide thru-bolt with recessed square steel plate and nut recessed into and grouted flush with slab. Verify with structural engineer prior to start of work.

3.02 PIPE HANGERS AND SUPPORTS

A. Support horizontal piping as follows:

| PIPE SIZE | MAX. HANGER SPACING | HANGER DIAMETER |
|---|---|---|
| (Steel Pipe) | | |
| 1/2 to 1-1/4 inch | 7’-0” | 3/8" |
| 1-1/2 to 3 inch | 10'-0" | 3/8" |
| 4 to 6 inch | 10'-0" | 1/2" |
| 8 to 10 inch | 10'-0" | 5/8" |
| 12 to 14 inch | 10'-0" | 3/4" |
| 15 inch and over | 10'-0" | 7/8" |
| (Copper Pipe) | | |
| 1/2 to 1-1/4 inch | 5'-0" | 3/8" |
| 1-1/2 to 2-1/2 inch | 8'-0" | 3/8" |
| 3 to 4 inch | 10'-0" | 3/8" |
| 6 to 8 inch | 10'-0" | 1/2" |
| (Cast Iron) | | |
| 2 to 3 inch | 5'-0" | 3/8" |
| 4 to 6 inch | 10'-0" | 1/2" |
| 8 to 10 inch | 10'-0" | 5/8" |
| 12 to 14 inch | 10'-0" | 3/4" |
| 15 inch and over | 10'-0" | 7/8" |
| (PVC Pipe) | | |
| 1-1/2 to 4 inch | 4'-0" | 3/8" |
| 6 to 8 inch | 4'-0" | 1/2" |
| 10 and over | 4'-0" | 5/8" |

B. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.

C. Place a hanger within 12 inches of each horizontal elbow and at the vertical horizontal

transition.

D. Use hangers with 1-1/2 inch minimum vertical adjustment.

E. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.

F. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.

G. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

H. Support riser piping independently of connected horizontal piping.

I. Install hangers with nut at base and above hanger; tighten upper nut to hanger after final installation adjustments.

J. Portable pipe hanger systems shall be installed per manufactures instructions.

3.03 Insulated Piping: Comply with the following installation requirements.

A. Clamps: Attach galvanized clamps, including spacers (if any), to piping with clamps projecting through insulation; do not exceed pipe stresses allowed by ASME B31.9.

B. Saddles: Install galvanized protection saddles MSS Type 39 where insulation without vapor barrier is indicated. Fill interior voids with segments of insulation that match adjoining pipe insulation.

C. Shields: Install protective shields MSS Type 40 on cold and chilled water piping that has vapor barrier. Shields shall span an arc of 180 degrees and shall have dimensions in inches not less than the following:

| NPS | LENGTH | THICKNESS |
|---|---|---|
| 1/4 THROUGH 3-1/2 | 12 | 0.048 |
| 4 | 12 | 0.060 |
| 5 & 6 | 18 | 0.060 |
| 8 THROUGH 14 | 24 | 0.075 |
| 16 THROUGH 24 | 24 | 0.105 |

D. Piping 2” and larger provide galvanized sheet metal shields with calcium silicate at hangers/supports.

E. Insert material shall be at least as long as the protective shield.

F. Thermal Hanger Shields: Install where indicated, with insulation of same thickness as piping.

3.04 FLASHING

A. Provide flexible flashing and metal counter flashing where piping and ductwork penetrate weather or waterproofed walls, floors, and roofs.

B. Flash vent and soil pipes projecting 8 inches minimum above finished roof surface with lead worked one inch minimum into hub, 8 inches minimum clear on sides with 24 x 24 inches sheet size. For pipes through outside walls, turn flanges back into wall and caulk, metal counter flash and seal.

C. Flash floor drains in floors with topping over finished areas with lead, 10 inches clear on sides with minimum 36 x 36 inch sheet size. Fasten flashing to drain clamp device.

D. Seal floor shower mop sink and all other drains watertight to adjacent materials.

E. Provide curbs for mechanical roof installations 8 inches minimum high above roofing surface. Contact architect for all flashing details and roof construction. Seal penetrations watertight.

3.05 SLEEVES

A. Set sleeves in position in formwork. Provide reinforcing around sleeves.

B. Extend sleeves through floors minimum one inch above finished floor level. Caulk sleeves full depth with fire rated thermfiber and 3M caulking and provide floor plate.

C. Where piping or ductwork penetrates floor, ceiling, or wall, close off space between pipe or duct and adjacent work with U.L. listed fire stopping insulation and caulk seal air tight. Provide close fitting metal collar or escutcheon covers at both sides of penetration.

D. Fire protection sleeves may be flush with floor of stairways.

**END OF SECTION**

**SECTION 22 05 48 – VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING**

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Vibration and sound control products.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of Contract including General and Supplementary Conditions and Division One specification sections, apply to work of this section

B. This section is Division-22 Basic Materials and Methods section, and is part of each Division-22 section making reference to vibration control products specified herein.

1.03 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of vibration control products, of type, size, and capacity required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Vibration and sound control products shall conform to ASHRAE criteria for average noise criteria curves for all equipment at full load conditions.

C. Except as otherwise indicated, sound and vibration control products shall be provided by a single manufacturer.

1.04 SUBMITTALS

A. SHOP DRAWINGS: Indicate size, material, and finish. Show locations and installation procedures. Include details of joints, attachments, and clearances.

B. PRODUCT DATA: Submit schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, product variations, and accessories.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Amber/Booth Company, Inc.

B. Mason Industries, Inc.

C. Noise Control, Inc.

2.02 GENERAL

A. Provide vibration isolation supports for equipment, piping and ductwork, to prevent transmission of vibration and noise to the building structures that may cause discomfort

to the occupants.

B. Model numbers of Amber/Booth products are included for identification. Products of the additional manufacturers will be acceptable provided they comply with all of the requirements of this specification.

2.03 PIPING

A. Furnish line size flexible connectors at supply and return of pumps, amber/booth style 2800 single sphere EPDM construction, connector shall include 150 lb. cadmium plated carbon steel floating flanges.

2.04 CORROSION PROTECTION

A. All vibration isolators shall be designed and treated for resistance to corrosion.

B. Steel components: PVC coated or phosphated and painted with industrial grade enamel. Nuts, bolts, and washers: zinc-electroplated.

PART 3 - EXECUTION

3.01 All equipment shall be installed in accordance with the manufacturers recommendations and printed installation instructions.

3.02 All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items required as per manufacturers requirements.

3.03 The vibration isolation supplier shall certify in writing that he has inspected the installation and that all external isolation materials and devices are installed correctly and functioning properly.

**END OF SECTION**

**SECTION 22 05 53 – IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT**

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. The Basic Materials and Methods, Section 22 02 00, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.

1.03 Refer to Architectural Sections for additional requirements.

PART 2 - PRODUCTS

2.01 VALVE AND PIPE IDENTIFICATION

A. Valves:

1. All valves shall be identified with a 1-1/2" diameter brass disc wired onto the handle. The disc shall be stamped with 1/2" high depressed black filled identifying numbers. These numbers shall be numerically sequenced for all valves on the job.
2. The number and description indicating make, size, model number and service of each valve shall be listed in proper operational sequence, properly typewritten. Three copies to be turned over to Owner at completion.
3. Tags shall be fastened with approved meter seal and 4 ply 0.018 smooth copper wire. Tags and fastenings shall be manufactured by the Seton Name Plate Company or approved equal.
4. All valves shall be numbered serially with all valves of any one system and/or trade grouped together.

B. Pipe Marking:

1. All interior visible piping located in accessible spaces such as above accessible ceilings, equipment rooms, attic space, under floor spaces, etc., shall be identified with all temperature pipe markers as manufactured by W.H. Brady Company, 431 West Rock Ave., New Haven, Connecticut, or approved equal.
2. All exterior visible piping shall be identified with UV and acid resistant outdoor grade acrylic plastic markers as manufactured by Set Mark distributed by Seton nameplate company. Factory location 20 Thompson Road, Branford, Connecticut, or approved equal.
3. Generally, markers shall be located on each side of each partition, on each side of each tee, on each side of each valve and/or valve group, on each side of each

piece of equipment, and, for straight runs, at equally spaced intervals not to exceed 75 feet. In congested area, marks shall be placed on each pipe at the points where it enters and leaves the area and at the point of connection of each piece of equipment and automatic control valve. All markers shall have directional arrows.

4. Markers shall be installed after final painting of all piping and equipment and in such a manner that they are visible from the normal maintenance position. Manufacturer's installation instructions shall be closely followed.
5. Markers shall be colored as indicated below per ANSI/OSHA Standards:

| SYSTEM | COLOR | LEGEND |
|---|---|---|
| Sanitary Sewer | Green | Vent Sanitary Sewer |
| Domestic Water | Green | Domestic Water |
| Domestic Hot Water Supply | Yellow | Domestic Hot Water Supply |
| Domestic Hot Water Recirculating | Yellow | Domestic Hot Water Return |
| Fire Protection | Red | Fire Protection |
| Automatic Sprinkler | Red | Fire Sprinkler |

C. Pipe Painting:

1. All piping exposed to view shall be painted as indicated or as directed by the Architect in the field. Confirm all color selections with Architect prior to installation.
2. The entire fire protection piping system shall be painted red.
3. All piping located in mechanical rooms and exterior piping shall be painted as indicated below:

| System | Color |
|---|---|
| Sanitary Sewer Waste and Vent | Light Gray |
| Domestic Cold Water | Dark Blue |
| Domestic Hot Water Supply and Return | Orange |

PART 3 - EXECUTION

3.01 All labeling equipment shall be installed as per manufacturers printed installation instructions.

3.02 All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Contractor’s price shall include all items required as per manufacturers' requirements.

3.03 All piping shall be cleaned of rust, dirt, oil and all other contaminants prior to painting. Install primer and a quality latex paint over all surfaces of pipe.

**END OF SECTION**

**SECTION 22 07 16 – PLUMBING EQUIPMENT INSULATION**

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. The Basic Materials and Methods, Section 22 02 00, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

A. Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.

B. Work specified elsewhere.

1. Basic materials and methods.
2. Piping systems.
3. Air distribution equipment.

1.03 WARRANTY

A. Warrant the Work specified herein for one year against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials and workmanship.

B. Defects shall include, but not be limited to, the following:

1. Mildewing.
2. Peeling, cracking, and blistering.
3. Condensation on exterior surfaces.

1.04 SUBMITTALS

A. SHOP DRAWINGS: Indicate size, material, and finish. Show locations and installation procedures. Include details of joints, attachments, and clearances.

B. PRODUCT DATA: Submit schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, product variations, and accessories.

1.05 DELIVERY AND STORAGE

A. DELIVERY: Deliver undamaged materials in the manufacturer's unopened containers clearly labeled with flame and smoke ratings.

PART 2 - PRODUCTS

2.01 It is the intent of these specifications to secure superior quality workmanship resulting in an absolutely satisfactory installation of insulation from the standpoint of both function and appearance. Particular attention shall be given to valves, fittings, pumps, etc., requiring low temperature insulation to insure full thickness of insulation and proper application of the vapor seal. All flaps of vapor barrier jackets and/or canvas covering must be neatly and securely smoothed and sealed down.

2.02 The type of insulation and its installation shall be in strict accordance with these specifications for each service, and the application technique shall be as recommended by the manufacturer. All insulation types, together with adhesives and finishes shall be submitted and approved before any insulation is installed.

2.03 A sample quantity of each type insulation and each type application shall be installed and approval secured prior to proceeding with the main body of the work. Condensation caused by improper installation of insulation shall be corrected by Installing Contractor. Any damage caused by condensation shall be made good at no cost to the Owner or Architect/Engineer.

2.04 Glass fiber materials as manufactured by Owens/Corning, PPG, CSG, or Johns Manville will be acceptable, if they comply with the specifications.

2.05 All insulation shall have composite (insulation, jacket or facing, and adhesive used to adhere the facing or jacket to insulation) fire and smoke hazard as tested by Procedure ASTM E084, NFPA 255 and UL 723 not exceeding:

Flame Spread 25
Smoke Developed 50

2.06 Accessories, such as adhesives, mastics and cements shall have the same component ratings as listed above.

2.07 All products or their shipping cartons shall have a label affixed, indicating flame and smoke ratings do not exceed the above requirements.

PART 3 - EXECUTION

3.01 All insulation shall be installed in accordance with the manufacturer’s recommendations and printed installation instructions.

3.02 All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items required as per manufacturers requirements.

**END OF SECTION**

**SECTION 22 07 19 – PLUMBING PIPING INSULATION**

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. The Basic Materials and Methods, Section 22 02 00, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

A. Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.

B. Furnish and install piping insulation to:

1. Interior domestic hot water and hot water return piping.
2. Interior domestic cold water piping.
3. Drain bodies and associated piping.

C. Work specified elsewhere.

1. Painting.
2. Pipe hangers and supports.

D. For insulation purposes, piping is defined as the complete piping system including supplies and returns, pipes, valves, automatic control valve bodies, fittings, flanges, strainers, thermometer wells, unions, pressure reducing stations, and orifice assemblies.

1.03 WARRANTY

A. Warrant the Work specified herein for one year against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials or workmanship.

B. Defects shall include, but not be limited to, the following:

1. Mildewing.
2. Peeling, cracking, and blistering.
3. Condensation on exterior surfaces.

1.04 SUBMITTALS

A. SHOP DRAWINGS: Indicate size, material, and finish. Show locations and installation procedures. Include details of joints, attachments, and clearances.

B. PRODUCT DATA: Submit schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, project variations, and accessories.

1.05 DELIVERY AND STORAGE

A. DELIVERY: Deliver undamaged materials in the manufacturer's unopened containers. Containers shall be clearly labeled with the insulation's flame and smoke ratings.

PART 2 - PRODUCTS

2.01 It is the intent of these specifications to secure superior quality workmanship resulting in an absolutely satisfactory installation of insulation from the standpoint of both function and appearance. Particular attention shall be given to valves, fittings, pumps, etc., requiring low temperature insulation to insure full thickness of insulation and proper application of the vapor seal. All flaps of vapor barrier jackets and/or canvas covering must be neatly and securely smoothed and sealed down.

2.02 The type of insulation and its installation shall be in strict accordance with these specifications for each service, and the application technique shall be as recommended by the manufacturer. All insulation types, together with adhesives and finishes shall be submitted and approved prior to installation.

2.03 A sample quantity of each type of insulation and each type application shall be installed and approval secured prior to proceeding with the main body of the work. Condensation caused by improper installation of insulation shall be corrected by Installing Contractor. Any damage caused by condensation shall be made good at no cost to the Owner or Architect/Engineer.

2.04 All insulation shall have composite (insulation, jacket or facing, and adhesive used to adhere the facing or jacket to insulation) fire and smoke hazard as tested by Procedure ASTM E084, NFPA 255 and UL 723 not exceeding:

Flame Spread 25
Smoke Developed 50

2.05 Accessories, such as adhesives, mastics and cements shall have the same component ratings as listed above.

2.06 All products or their shipping cartons shall have a label affixed, indicating flame and smoke ratings do not exceed the above requirements.

2.07 APPROVED MANUFACTURERS

A. Calcium silicate materials shall be as manufactured by Johns Manville.

B. Glass fiber materials shall be as manufactured by Johns Manville or Owens-Corning and shall have the same thermal properties, density, fire rating, vapor barrier, etc., as the types specified herein, subject to review by the Engineer.

C. Adhesives shall be as manufactured by Childers, Foster, HB Fuller or Armstrong, and shall have the same adhesive properties, fire rating, vapor seal, etc., as the types specified

herein, subject to review by the Engineer.

D. Armaflex elastomeric cellular thermal insulation by Armstrong.

E. Phenolic foam insulation shall be as manufactured by Kooltherm Insulation (Koolphen).

F. Metal jacketing and fitting covers shall be as manufactured by Childers or RPR Products, Inc.

2.08 MATERIALS

A. INTERIOR DOMESTIC WATER PIPE: provide fiberglass pipe insulation with all service jackets with self sealing lap joint.

PART 3 - EXECUTION

3.01 All insulation shall be installed in accordance with the manufacturers' recommendations and printed installation instructions, including high density inserts at all hangers and pipe supports to prevent compression of insulation.

3.02 All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items required as per manufacturers requirements.

3.03 Pipes located outdoors or in tunnels shall be insulated same as concealed piping; and in addition shall have a jacket of 0.016 inch thick, smooth aluminum with longitudinal modified Pittsburg Z-Lock seam and 2 inch overlap. Jacketing shall be easily removed and replaced without damage. All butt joints shall be sealed with gray silicone. Galvanized banding is not acceptable.

3.04 All insulated piping located over driveways shall have an aluminum shield permanently banded over insulation to protect it from damage from car antennas.

3.05 WATER PIPE INSULATION INSTALLATION

A. The insulation shall be applied to clean, dry pipes with all joints firmly butted together. Where piping is interrupted by fittings, flanges, valves or hangers and at intervals not to exceed 25 feet on straight runs, an isolating seal shall be formed between the vapor barrier jacket and the bare pipe. The seal shall be by the applications of adhesive to the exposed insulation joint faces, carried continuously down to and along 4 inches of pipe and up to and along 2 inches of jacket.

B. Pipe fittings and valves shall be insulated with pre-molded or shop fabricated glass fiber covers finished with two brush coats of vapor barrier mastic reinforced with glass fabric.

C. All under lap surfaces shall be clean and free of dust, etc. before the SSL is sealed. These laps shall be firmly rubbed to insure a positive seal. A brush coat of vapor retarder shall be applied to all edges of the vapor barrier jacket.

D. At hangers and supports, provide a high density foam insulation insert that extends 2" beyond the shield on each side and a protective shield/saddle to prevent compression/damage. Secure shield/saddle to insulation using mastic or strapping tape.

3.06 FIRE RATED INSULATION

A. All pipe penetrations through walls and concrete floors shall be fire rated by applying USG Thermafiber in the space between the concrete and the pipe.

B. The fire rating shall be additionally sealed by using 3M brand model CP 25 or 303 fire barrier caulk and putty.

C. All fire rating material shall be insulated in accordance with manufacturer's printed instructions.

PART 4 - SCHEDULES

4.01 LOW TEMPERATURE SURFACES MINIMUM INSULATION THICKNESS

BASED ON FIBERGLASS

| | | |
|---|---|---|
| A. | Exposed exterior domestic water pipe: | 1½ inch |
| B. | Interior domestic cold water pipe: | 1 inch |
| C. | Condensate drain lines: | ¾ inch |
| D. | Drains receiving condensate: | 1 inch |
| E. | Concealed piping from roof drains: | 1½ inch blanket wrap |
| F. | Exposed piping from roof drains: | 1 inch thick rigid with all service jacket |

4.02 HIGH TEMPERATURE SURFACES MINIMUM INSULATION THICKNESS

A. Domestic Hot Water and Domestic Hot Water Return Piping

| | | |
|---|---|---|
| 1. | Pipe sizes 1-1/4 inch and smaller with Operating temperatures of 140°F or less | 1 inch |
| 2. | Pipe sizes 1-1/2 inch and larger with Operating temperatures of 140°F or less | 1-1/2 inch |
| 3. | Pipe sizes 1-1/4 inch and smaller with Operating temperatures greater than 140°F | 1-1/2 inch |
| 4. | Pipe sizes 1-1/2 inch and larger with Operating temperatures greater than 140°F | 2 inch |

**END OF SECTION**

**SECTION 22 10 00 - PLUMBING PIPING**

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. The Basic Materials and Methods, Section 22 02 00, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

A. The scope of the work shall include the furnishing and complete installation of the piping covered by this Section, with all appurtenances, ready for the Owner's use.

B. Include the following work in addition to items normally part of this Section:

1. Pipe and pipe fittings:

a. Sanitary drainage piping system.

b. Sub-surface drainage piping system.

c. Domestic water piping system.

2. Adapters, Transitions, Unions, Couplings, Flanges, Connectors

3. Valves

4. Excavation, Bedding, and Backfill

1.03 RELATED WORK

A. Section 22 05 29 – Hangers and Support for Plumbing Piping and Equipment.

B. Section 22 05 48 – Vibration and Seismic Controls for Plumbing Piping.

C. Section 22 05 53 – Identification for Plumbing Piping and Equipment.

D. Section 22 07 19 – Plumbing Piping Insulation.

E. Section 22 11 19 – Plumbing Specialties.

F. Section 22 30 00 – Plumbing Equipment.

G. Section 22 40 00 – Plumbing Fixtures.

1.04 REFERENCES

A. ASME – Boiler and Pressure Vessel Code.

B. ASME Section IX – Welding and Brazing Qualifications.

C. ASME B1.20.1 – Pipe Threads, General Purpose.

D. ASME B16.1 – Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250.

E. ASME B16.3 - Malleable Iron Threaded Fittings: Classes 150 and 300.

F. ASME B16.4 – Gray Iron Threaded Fittings: Classes 125 and 250.

G. ASME B16.5 – Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard.

H. ASME B16.14 – Ferrous Pipe Plugs, Bushings, and Locknuts with Pipe Threads.

I. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings.

J. ASME B16.23 – Cast Copper Alloy Solder Joint Drainage Fittings: DWV.

K. ASME B31.3 – Process Piping.

L. ASME B31.9 – Building Services Piping.

M. ASTM A47 – Standard Specification for Ferritic Malleable Iron Castings.

N. ASTM A53 – Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless.

O. ASTM A74 – Standard Specification for Cast Iron Soil Pipe and Fittings.

P. ASTM A126 – Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

Q. ASTM A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

R. ASTM A197 – Standard Specification for Cupola Malleable Iron.

S. ASTM A395 – Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures.

T. ASTM A536 – Standard Specification for Ductile Iron Castings.

U. ASTM A582 – Standard Specification for Free-Machining Stainless Steel Bars.

V. ASTM B32 – Standard Specification for Solder Metal.

W. ASTM B42 – Standard Specification for Seamless Copper Pipe, Standard Sizes.

X. ASTM B43 – Standard Specification for Seamless Red Brass Pipe, Standard Sizes.

Y. ASTM B62 – Standard Specification for Composition Bronze or Ounce Metal Castings.

Z. ASTM B75 – Standard Specification for Seamless Copper Tube.

AA. ASTM B148 – Standard Specification for Aluminum-Bronze Sand Castings.

BB. ASTM B306 – Standard Specification for Copper Drainage Tube (DWV).

CC. ASTM B584 – Standard Specification for Copper Alloy Sand Castings for General Applications.

DD. ASTM B828 – Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings.

EE. ASTM C33/C33M – Standard Specification for Concrete Aggregates.

FF. ASTM C94 – Standard Specification for Ready-Mix Concrete.

GG. ASTM C150 – Standard Specification for Portland Cement.

HH. ASTM C564 – Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.

II. ASTM C1053 – Standard Specification for Borosilicate Glass Pipe and Fittings for Drain, Waste, and Vent (DWV) Applications.

JJ. ASTM C1173 – Standard Specification for Flexible Transition Couplings for Underground Piping Systems.

KK. ASTM C1277 – Standard Specification for Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings.

LL. ASTM C1540 – Standard Specification for Heavy Duty Shielded Couplings Joining Hubless Cast Iron Soil Pipe and Fittings.

MM. ASTM D635 – Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.

NN. ASTM D1784 – Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.

OO. ASTM D1785 – Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.

PP. ASTM D2241 – Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).

QQ. ASTM D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.

RR. ASTM D2464 – Standard Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.

SS. ASTM D2466 – Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.

TT. ASTM D2467 – Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.

UU. ASTM D2564 – Standard Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.

VV. ASTM D2665 – Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.

WW. ASTM D2672 – Standard Specification for Joints for IPS PVC Pipe Using Solvent Cement.

XX. ASTM D2729 – Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

YY. ASTM D2774 – Standard Practice for Underground Installation of Thermoplastic Pressure Piping.

ZZ. ASTM D2843 – Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics.

AAA. ASTM D2846 – Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Hot and Cold Water Distribution Systems.

BBB. ASTM D2855 – Standard Practice for the Two-Step (Primer and Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets.

CCC. ASTM D3034 – Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

DDD. ASTM D3139 – Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.

EEE. ASTM D3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.

FFF. ASTM D3311 – Standard Specification for Drain, Waste, and Vent (DWV) Plastic Fittings Patterns.

GGG. ASTM D4976 – Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.

HHH. ASTM D5926 – Standard Specification for Poly (Vinyl Chloride) (PVC) Gaskets for Drain, Waste, and Vent (DWV), Sewer, Sanitary, and Storm Plumbing Systems.

III. ASTM D6707 – Standard Specification for Circular-Knit Geotextile for Use in Subsurface Drainage Applications.

JJJ. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

KKK. ASTM F439 – Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.

LLL. ASTM F441 – Standard Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.

MMM. ASTM F477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

NNN. ASTM F493 – Standard Specification for Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.

OOO. ASTM F656 – Standard Specification for Primers for Use in Solvent Cement Joints of Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.

PPP. ASTM F913 – Standard Specification for Thermoplastic Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

QQQ. ASTM F1336 – Standard Specification for Poly (Vinyl Chloride) (PVC) Gasketed Sewer Fittings.

RRR. ASTM F1476 – Standard Specification for Performance of Gasketed Mechanical Couplings for Use in Piping Applications.

SSS. ASTM F1548 – Standard Specification for Performance of Fittings for Use with Gasketed Mechanical Couplings Used in Piping Applications.

TTT. AWS A5.8 – Specification for Filler Metals for Brazing and Braze Welding.

UUU. AWS 5.31 – Specification for Fluxes for Brazing and Braze Welding.

VVV. AWWA C105 – Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems.

WWW. AWWA C111 – Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings.

XXX. AWWA C209 – Standard for Cold-Applied Tape Coatings for the Exterior of Special Sections, Connections, and Fittings for Steel Water Pipelines.

YYY. AWWA C219 – Bolted, Sleeve-Type Couplings for Plain-End Pipe.

ZZZ. AWWA C509 – Resilient-Seated Gate Valves for Water Supply Service.

AAAA. AWWA C515 – Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Services.

BBBB. AWWA C651 – Disinfecting Water Mains.

CCCC. CISPI 301 – Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.

DDDD. CISPI 310 – Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications.

EEEE. ASSE 1003 Performance Requirements for Water Pressure Reducing Valves for Domestic Water Distribution Systems.

FFFF. ASSE 1079 – Performance Requirements for Dielectric Pipe Unions.

GGGG. UL 94 Standard for Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.

HHHH. UL 1285 Standard for Safety Pipe and Couplings, PVC and PVCO for Underground Fire Service.

IIII. NSF/ANSI 61 – Drinking Water System Components – Health Effects.

JJJJ. NSF/ANSI 372 – Drinking Water System Components – Lead Content.

KKKK. Federal Specifications and Standards DD-G-541B – Glass (Laboratory).

1.05 QUALITY ASSURANCE

A. Manufacturer: For each product specified, provide components by the same manufacturer throughout.

B. Valves: Manufacturer's name, size, and pressure rating shall be cast or marked on valve body or handle.

C. Piping shall be labeled along its entire length indicating size, class, material specification, manufacturer’s name and country of origin.

D. Foreign pipe, fittings or valves are unacceptable.

E. All cast iron soil pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and shall be listed by NSF International.

F. Welding Materials and Procedures: Conform to ASME Code and applicable state labor regulations.

G. Welders Certification: In accordance with ASME Section IX.

1.06 SUBMITTALS

A. Submit under provisions of Division One.

B. Submit product data under provisions of Division One.

C. Include pipe materials, pipe fittings, valves, and accessories. Provide manufacturer's catalog information, product certifications, and **country of origin**. Indicate valve data and ratings.

1.07 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Division One.

B. Record actual locations of valves.

1.08 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Division One.

B. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.

1.09 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with a minimum of 5 years documented experience and must be a domestic manufacturer.

B. Installer: Company specializing in performing the work of this section with a minimum of 5 years documented experience.

1.10 DELIVERY, STORAGE, AND HANDLING

A. DELIVERY: Deliver clearly labeled piping and valves to; and store, protect and handle products on site in accordance with the provisions of Division One.

B. TIMING AND COORDINATION: Arrange for delivery of materials to allow for minimum storage time at the project site. Coordinate with the scheduled time of installation.

C. ACCEPTANCE: Accept product on site in original factory packaging. Receive valves on site in shipping containers with labeling in place. Inspect for damage. Damaged valves shall not be acceptable.

D. STORAGE: Store materials in a clean, dry location, protected from weather and damage.

E. Provide temporary protective coating on cast iron and steel valves.

F. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

G. Protect installed piping systems from entry of foreign materials by providing temporary covers, as completing sections of the work, and isolating parts of completed systems. Tape will not be allowed as an acceptable end cover.

1.11 EXTRA MATERIALS

A. Furnish under provisions of Division One.

1.12 REGULATORY REQUIREMENTS

A. Perform work in accordance with plumbing and building codes having jurisdiction.

B. No PVC pipe or fittings, or similar un-rated material, will be allowed in any areas where pipe is to penetrate a fire rated assembly or is to be installed in a return air plenum unless the entire length of all such piping is encased within a minimum two (2) hour fire rated enclosure.

PART 2 - PRODUCTS

2.01 SANITARY SOIL, WASTE AND VENT PIPING, BURIED WITHIN 5 FEET OF BUILDING, BELOW GRADE

A. Cast Iron Pipe: ASTM A74 service weight.

1. Fittings: Cast iron, ASTM A74 drainage pattern.
2. Joints: Hub and spigot, ASTM C564 neoprene, compression type gaskets or lead and oakum.

2.02 SANITARY SOIL, WASTE AND VENT PIPING, WITHIN BUILDING, ABOVE GRADE

A. Cast Iron Pipe: ASTM A74 service weight.

1. Fittings: Cast iron, ASTM A74 drainage pattern.
2. Joints: Hub and spigot, ASTM C564 neoprene, compression type gaskets or lead and oakum.

B. Cast Iron Pipe: CISPI 301 or ASTM A888, hubless, service weight.

1. Fittings: Cast iron, CISPI 301 or ASTM A888 drainage pattern.

2. Joints: No hub, ASTM C564 neoprene gaskets with ASTM C1540 heavy duty wide bodied stainless steel clamp and solid shield assembly constructed of type 300 series stainless steel. Couplings shall have four clamps for pipe sizes up to and including 4” and shall have six clamps for pipe sizes larger than 4”. Clamp

assemblies shall conform to FM 1680 Class 1 where required by the administrative authority. Torque all clamps per manufacturer's recommendations.

C. Copper Tubing: ASTM B306, DWV, for sizes 2" and smaller.

1. Fittings: ASME B16.23 cast copper alloy solder joint drainage fittings (DWV), or ASME B16.29, wrought copper and wrought copper alloy solder joint drainage fittings (DWV).
2. Joints between copper pipe and fittings shall be made in accordance with ASTM B828 using ASTM B32 Alloy Grade Sn 50 solder (50-50 tin-lead).
3. Joints between copper and cast iron pipe shall be made by way of copper soldered to a brass ferrule and the ferrule joined to the cast iron hub by a compression or caulked joint.

D. Brass Pipe: ASTM B43, chrome plated

1. Fittings: ASME B16.23 cast bronze, chrome plated.
2. Joints: In accordance with ASTM B828 using ASTM B32 Alloy Grade Sn 50 solder (50-50 tin-lead) or as recommended by the manufacturer.

2.03 DOMESTIC WATER PIPING, WITHIN BUILDING, ABOVE GRADE

A. Copper Tubing: ASTM B88, Type L, hard drawn.

1. Fittings: ASME B16.18, cast bronze or ASTM B16.22 wrought copper alloy solder joint pressure fittings.
2. Joints between copper pipe and fittings shall be made in accordance with ASTM B828 using ASTM B32 Alloy HB lead-free solder.

2.04 ADAPTERS, TRANSITIONS, UNIONS, COUPLINGS, FLANGES, CONNECTORS

A. (Non-Acid Waste) Drainage Applications:

1. Provide approved listed adapter and transition fittings appropriate to the specific pipe transition and in accordance with code requirements.
2. For dissimilar piping above ground, provide stainless steel shielded, molded elastomeric couplings and adapters meeting ASTM C564 and ASTM C1460. Applies to installations including cast iron to PVC transitions immediately adjacent to building slabs on grade.
3. For dissimilar underground piping not below building slab, provide shear resistant .012" thick 300 series stainless steel shielded, PVC gasketed flexible couplings and adapters meeting ASTM D5926 and ASTM C1173. For direct-bury applications, provide AWWA C209 cold-applied, integrated primer type, elastomeric adhesive, laminate polymeric tape coating, minimum 35 mil nominal thickness, in accordance with manufacturer's installation guidelines, to completely wrap the shield, banding, and screws. Chase Construction Products Tapecoat H35 or approved equivalent.
4. Acceptable manufacturers:

a. Anaco-Husky/Cremco
b. Mission Rubber Company LLC
c. Fernco, Inc.
d. Fernco, Inc. Strong Back RC 1000 Series (underground piping, not below building slab; or readily accessible underground piping transitions in backwater valve pits, etc.)

5. Adapters, couplings, bushings for copper DWV pipe shall be cast bronze or wrought copper, ASME B16.23/B16.29.

B. Domestic Water Applications:

1. Provide joints between various materials with approved adapter and transition fittings appropriate to the specific pipe transition and in accordance with code requirements and the manufacturer's instructions.
2. For copper tube and pipe: adapters, bushings, plugs, caps, and couplings shall be wrought copper or cast bronze; flanges (minimum class 150) and unions shall be cast bronze. Provide with solder or threaded connections as necessary and as produced to applicable ASME standards B16.15, B16.18, B16.22, B16.24, B16.50, B1.20.1. All such appurtenances shall be for use in above ground potable water systems.
3. Above slab transitions for water service entries:
   a. 100% fusion bonded epoxy coated ASTM A536 cast ductile iron construction coupling with acrylonitrile butadiene rubber (NBR) gaskets and EPDM insulating boot for water service. 5/8 inch high strength stainless steel bolts and nuts. Coupling shall meet AWWA C219. Romac Industries, Inc. IC501 or pre-approved equivalent.
   b. 100% fusion bonded 14 mil epoxy coated coupling with ASTM A536 cast ductile iron rings. Complete with acrylonitrile butadiene rubber (NBR) gaskets and type 304 stainless steel bridge, spacers, nuts, and bolts. Coupling shall meet AWWA C219, NSF 61, and NSF 372. Krausz USA Hymax Grip Coupling Restraint or pre-approved equivalent.
4. Dielectric connections:
   a. For pipe sizes 2 inch and smaller, provide lead-free dielectric unions, rated to 180 F at 250 psi and compliant to ASSE 1079.
   b. For pipe sizes larger than 2 inches, provide lead-free dielectric flanged pipe fittings, rated to 180 F at 175 psi and meeting ASME B16.1.
   c. For grooved copper joining systems, provide grooved end dielectric transition fitting from system manufacturer, with virgin polypropylene internal lining, meeting NSF 61.

C. General:

1. Unions for ferrous pipe shall be ASTM B16.39 galvanized malleable iron, threaded, minimum pressure class 150.
2. Plugs and bushings for ferrous pipe shall be ASME B16.14 galvanized malleable iron, threaded.
3. Nipples for ferrous pipe shall be schedule 40, galvanized, ASTM A53 welded steel pipe nipples, threaded, meeting ASTM A733.
4. Couplings for ferrous pipe shall be galvanized steel, threaded, manufactured in accordance with ASTM A865.

5. Flanges for ferrous pipe shall be galvanized forged steel construction, either socket weld or slip-on weld type, minimum pressure class 150, manufactured to ASME B16.5.
6. Bolts, nuts, and gaskets for flanged connections shall be appropriate to the pipe material, fluid type, temperature, and pressure. 1/16" thick pre-formed neoprene, typical.
7. Provide flexible stainless steel connectors at pumps and other such equipment, in accordance with manufacturer's recommendations. Connectors shall have corrugated hose and braided 300 series stainless steel jacketing. Carbon steel flanged or grooved ends as appropriate. NSF 372 lead-free for all potable water applications. Metraflex Company or pre-approved equivalent.

BALL VALVES

A. All bronze cast construction two-piece 600 psi body, blow-out proof stem, Teflon seated, lead-free, with stainless steel trim (including ball, stem, and valve handle). Threaded connections. Certified lead-free to NSF 61/NSF 372 and suited to 180 degrees F.

B. Basis of design (bronze valves):

1. NIBCO T-585-66-LF (full port) for all sizes up through 2".
2. NIBCO T-580-66-LF (conventional port) for sizes 2-1/2" and 3".

C. Valves 4" and larger shall be split body stainless steel construction, 275 psi cold working pressure, blow-out proof stem, PTFE seated, type 316 stainless steel trimmed, class 150, full port design with manual gear operator. NIBCO F-515-S6-F-66-FS.

D. Acceptable alternate manufacturers:

1. Apollo 77 CLF-A series (full port) for all sizes up through 2".
2. Milwaukee UPBA-400S (full port) for all sizes up through 2".
3. Apollo 77 CLF-A series (full port) for size 2-1/2" and Apollo 70LF-140 series (standard port) for 3".
4. Milwaukee UPBA-100S (standard port) for sizes 2-1/2" and 3".

E. Applies to domestic water system installations.

F. Provide valves complete with extended lever handles as required to accommodate insulation and full valve operation.

G. Provide valves complete with memory stop kit where used for balancing applications.

## PART 3 - EXECUTION

### 3.01 EXCAVATION, BEDDING AND BACKFILL

A. This section shall apply for the excavation, bedding, and backfill of all buried piping unless specifically noted otherwise. All work shall be coordinated with any job site subsurface drainage/dewatering and adjusted accordingly.

B. Excavation:

1. Excavate trenches for underground piping to the required depths.
2. The bottom of the trench or excavation shall be cut to a uniform grade.
3. Should rock be encountered, excavate 6 inches below grade, fill with bedding material and tamp to existing density.
4. Coordinate alignment of pipe trenches to avoid obstructions. Ensure that proposed routing of pipe will not interfere with building foundation before any trenching has begun. Should conflicts occur, contact Architect/Engineer before proceeding.

C. Bedding and Backfill:

1. Backfill shall not be placed until the piping has been inspected, tested and approved. Complete backfill to the surface of natural ground or to the lines and grades indicated on drawings. Provide 6 inch stabilized sand bed with 4 inch stabilized sand cover around each pipe. Provide select fill up to finished surface or grade, unless indicated otherwise by project geotechnical report or specified otherwise in Division 02.
2. Compacting Backfill: Place material in uniform layers of 8 inches maximum, loose measure and compact to not less than 95% of maximum soil density as determined by ASTM D-698 Standard Proctor.
3. Restoration: Compact backfill, where trenching or excavation is required in improved areas such as pavements, walks and similar areas, to a condition equal to the adjacent undisturbed earth and restore surface of the area to the condition existing prior to trenching or excavating operation.
4. A clay fill “trench plug” extending 3 feet inside the building line and 5 feet outside the building line shall be placed to completely surround utility lines passing beneath the foundation and grade beam. The materials shall consist of on-site soils with a plasticity index (PI) between 30 and 40 percent compacted to at least 95 percent of the Standard Proctor and maximum dry density as determined by ASTM D-698.

D. Cement Stabilized Sand:

1. Materials:
   e. Cement shall be Type I Portland cement conforming to ASTM C150.
   f. Sand shall be clean, durable sand meeting grading requirements for fine aggregates of ASTM C33 and free of organic matter and deleterious substances.
   g. Water shall be potable and free of oils, acids, alkalis, organic matter, or other deleterious substances, meeting requirements of ASTM C94.
2. Mixture:
   a. Product shall consist of not less than 1.5 sacks of Portland cement per ton of dry sand.
   b. Mixture shall contain sufficient water to hydrate the cement and be thoroughly mixed in a pugmill type mixer.

E. For water lines (including In-Building Risers) intended for fire protection service, provide joint restraints by way of concrete thrust blocks in accordance with the requirements of NFPA 13 and NFPA 24.

F. Aggressive Soil Conditions: Soil shall be considered aggressive and protection of buried metallic piping shall be provided as specified if any of the following situations exist:

1. Conditions are identified as such by the project geotechnical report or project geotechnical engineer.
2. The soil environment is a landfill area, swamp, marsh, polluted river bottom, cinder bed, or has alkaline soils.
3. A score of ten or higher is tallied when applying the soil assessment tool detailed in Appendix A of AWWA C105. An excerpt of this evaluation procedure is provided below for reference but is not intended as a substitute for the complete and latest Standard:

**Numerical Corrosivity Scale**

| **Soil Parameter** | **Assigned Points** |
|---|---|
| | |
| **Resistivity (ohm-cm)** | |
| <700 | 10 |
| 700 – 1,000 | 8 |
| 1,000 – 1,200 | 5 |
| 1,200 – 1,500 | 2 |
| 1,500 – 2,000 | 1 |
| >2,000 | 0 |
| | |
| **pH** | |
| 0 – 2 | 5 |
| 2 – 4 | 3 |
| 4 – 6.5 | 0 |
| 6.5 – 7.5 | 0 |
| 7.5 – 8.5 | 0 |
| >8.5 | 3 |
| | |
| **Redox Potential (mV)** | |
| >100 | 0 |
| 50 – 100 | 3.5 |
| 0 – 50 | 4 |
| <0 | 5 |
| | |
| **Sulfides** | |
| Positive | 3.5 |
| Trace | 2 |
| Negative | 0 |
| | |
| **Moisture** | |

| | |
|---|---|
| Poor drainage continuously wet | 2 |
| Fair drainage generally moist | 1 |
| Good drainage generally dry | 0 |

3.02 INSTALLATION

A. General requirements for piping:

1. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
2. Remove any scale, oil and dirt, on inside and outside, before assembly.
3. Prepare piping connections to equipment with flanges or unions.
4. Confirm pipe placement, depth/elevation, and flow lines prior to any installation.

B. General requirements for valves:

1. Install valves with stems upright or horizontal, not inverted.
2. Valves shall be line-sized unless specifically noted otherwise.
3. Provide clearance for installation of insulation and access to valves and operable fittings. Valves installed beyond reasonable reach shall be provided with a chain operator.
4. Provide access doors where valves and operable fittings are not otherwise accessible. Access doors shall be of approved types set in locations pre-approved by submittal to the Architect.
5. Gate valves installed below grade shall be covered with an adjustable cast iron roadway box extended to grade. Cover shall be cast iron with 'water' cast on top of cover and shall be set flush to finished paving or 2" above finished earthen grade. Box shall be supported from undisturbed soil or concrete base and shall not introduce any stress to piping under all traffic conditions.

C. Install all materials in accordance with the manufacturer's published instructions.

D. All exposed sewer and water pipe in toilet rooms or other finished areas of the building shall be chromium plated.

E. Provide non-conducting dielectric connections wherever joining dissimilar metals.

F. Route piping in an orderly manner, parallel and perpendicular to building column grid lines, unless indicated otherwise on drawings, and maintain gradients.

G. Install piping to conserve building space and not conflict with other trades or interfere with intended use of space.

H. Group piping whenever practical at common elevations.

I. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

J. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

K. Provide encasement for and support for utility meters in accordance with the requirements of utility companies.

L. Prepare pipe, fittings, supports, and accessories not pre-finished, ready for finish painting.

M. Maintain uniformity in the installation of piping materials and joining methods. Do not mix material types.

N. Where connecting new underground sanitary, storm, or vent piping to existing piping of dissimilar material, provide suitable mechanical transition fittings complete with corrosion protection for metallic elements. Chase Construction Products Tapecoat H35 or approved equivalent and a final coat of coal tar to completely cover the transition.

O. Solder joints shall be wiped clean at each joint, remove excess metal while molten and flux residue when cooled.

P. Waste nipple from wall to tapped tee shall be schedule 40 threaded galvanized steel pipe or brass or copper with threaded adapter.

Q. General requirements for cast iron piping installation:

1. Install all pipe and fittings in accordance with published recommendations from the manufacturer and the Cast Iron Soil Pipe Institute (CISPI). Specific items referenced below are not intended as a substitute for the complete and latest recommendations.
2. Install bell and spigot type pipe with bell end upstream.
3. Above ground horizontal pipe (suspended) shall:
    a. Be supported at no less than at every joint, and within 18” of the hub or coupling.
    b. Be maintained in alignment. Sagging or grade reversal shall be unacceptable.
    c. Be supported at terminal ends of all runs or branches and at each change of direction or alignment.
    d. Have all closet bends, traps, trap arms, and similar branches firmly secured.
    e. Be braced to prevent movement or joint separation.
    f. Be provided with suitable sway bracing (such as clamps, rods, and hardware) where pipe and fittings are suspended in excess of 18” by means of non-rigid hangers.
4. Above ground vertical pipe shall:
    a. Be secured at each stack base.
    b. Be secured at each floor and riser clamps shall be provided on no greater than 15’-0” intervals.
    c. Be adequately supported to keep the system (pipe and contents) in alignment.
5. Provide seismic restraints in seismically active areas, whether specifically required by the prevailing code or not.

R. All grooved system tools and components (couplings, adapters, fittings, gaskets, **valves**, and specialties) shall be the product of a single domestic system manufacturer.

S. Grooved pipe system manufacturer shall provide on-site training for contractor's field personnel by a factory trained representative in the proper use of grooving tools, application of groove, and product installation. Factory trained representative shall periodically visit the job site and inspect installation. Contractor shall remove and replace any improperly installed products at no additional cost to the owner.

3.03 APPLICATION

A. Provide union downstream of all valves at equipment or apparatus connections.

B. Provide male adapters each side of threaded valves in copper piped system. Sweat solder adapters to tube prior to make-up of threaded connections.

C. Provide approved isolation valves for shut-off and to isolate all equipment items, distinct parts of systems, or vertical risers.

D. Each plumbing fixture shall have a shut-off valve on each hot water and cold water supply line.

E. Each plumbing water rough-in stub out shall be fitted with a shut off valve.

F. Valves installed in insulated piping shall be fitted with extended lever operators of sufficient length to raise handle above the insulation jacket material. Where valve is used for throttling service, the valve handle shall be equipped with adjustable memory stop device.

G. Provide non-slam type check valves on discharge lines from all water pumps. Install at a minimum length of 5 times the pipe diameter from the pump and in accordance with manufacturer's installation recommendations.

3.04 ERECTION TOLERANCES

A. All gravity drainage lines in the building shall have 1/4 inch per foot fall where possible and not less than 1/8 inch per foot fall toward the main sewer. Pipe must be laid so that the slope will be uniform and continuous. Permission shall be secured from the Architect and Engineer before proceeding with any Work where existing conditions prevent the installation at the minimum grade specified.

B. All vent and branch vent pipes shall be graded and connected as to drip back by gravity to the drainage pipe it serves. A slope of 1 inch per 40 feet will suffice for this requirement, subject to the approval of the local Authority Having Jurisdiction.

C. Slope all horizontal water piping with uniform pitch of 1/8 inch per 10 feet to low points to allow for complete system drainage. For long runs, where constant pitch cannot be maintained, provide intermediate low points and rise up again from such locations. Slope

horizontal branches back to mains or risers. Provide clearly identified supplementary drain valves where hose bibbs, hydrants, or sill cocks will not suffice for this requirement.

3.05 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Prior to starting work, all domestic water systems shall be complete, thoroughly flushed clean and free of all foreign matter or erection residue.

B. Ensure PH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).

C. On building side of the main shut off valve, provide a 3/4" connection through which chlorine can be introduced into the water piping

D. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, in sufficient quantity to obtain 50 to 80 mg/L residual free chlorine solution throughout the entire domestic water piping systems.

E. Bleed water from outlets as required to ensure complete distribution and test for disinfectant residual at a minimum 15 percent of total outlets.

F. Maintain disinfectant in system for 24 hours.

G. If final disinfectant residual tests less than 25 mg/L, repeat treatment.

H. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.

I. Take samples no sooner than 24 hours after flushing, from 5 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.06 SERVICE CONNECTIONS

A. Provide new sanitary and storm sewer services connecting to existing building services or utility lines as shown on the drawings.

B. Before commencing work, field verify invert elevations required for sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover as required.

C. Provide new domestic water service connecting to existing building services or utility lines as shown on plans. Assure connections are in compliance with requirements of the jurisdiction having authority.

D. Extension of services to the building shall be fabricated from the same materials as the utility service lines or those materials specified herein.

E. Should points of connection vary from those indicated on the drawings contractor shall properly allow for this in the actual connections field fabricated.

3.07 RODDING SEWERS

A. All sanitary soil and waste lines, both in the building and out, shall be rodded out after completion of the installation.

B. This Work shall be done, as part of the contract, to make certain that all lines are clear, and any obstruction that may be discovered shall be removed immediately. Rodding shall be accomplished by utilizing a rotary cutter, which shall be full size of pipe being cleaned.

3.08 TESTING OF PLUMBING PIPING SYSTEMS

A. During the progress of the work and upon completion, tests shall be made as specified herein and as required by Authorities Having Jurisdiction, including Inspectors, Owner or Architect. The Architect or duly authorized Construction Inspector shall be notified in writing at least 2 working days prior to each test or other Specification requirement which requires action on the part of the Construction Inspector.

B. Tests shall be conducted as part of this work and shall include all necessary instruments, equipment, apparatus, and service as required to perform the tests with qualified personnel. Submit proposed test procedures, recording forms, and test equipment for approval prior to the execution of testing.

C. Tests shall be performed before piping of various systems have been covered or furred-in. For insulated piping systems testing shall be accomplished prior to the application of insulation.

D. All piping systems shall be tested and proved absolutely tight for a period of not less than 24 hours. Tests shall be witnessed by the Architect or an authorized representative and pronounced satisfactory before pressure is removed or any water drawn off.

E. Leaks, damage or defects discovered or resulting from test shall be repaired or replaced to a like new condition. Leaking pipe joints, or defective pipe, shall be removed and replaced with acceptable materials. Test shall be repeated after repairs are completed and shall continue until such time as the entire test period expires without the discovery of any leaks.

F. Wherever conditions permit, each piping system shall thereafter be subjected to its normal operating pressure and temperature for a period of no less than five 5 days. During that period, it shall be kept under the most careful observation. The piping systems must demonstrate the propriety of their installation by remaining absolutely tight during this period.

G. Domestic Water: Pressure test at one and one half times the normal working pressure or 125 psig, whichever is the greater, for 24 hours.

H. Sanitary Soil, Waste and Vents and Storm Sewer:

1. After the rough-in soil, waste and vent and other parts of the sanitary sewer including branch laterals have been set from the lowest level, at point of connection to existing utility lines, to above the floor line, all outlets shall be temporarily plugged or capped, except as are required for testing as described herein. Ground work shall not permit the backfill of trenches to cover any joints until the

completion of testing. Back fill shall be limited to mid sections of full joints of piping only. For pipe in ground the piping shall be readied as described herein and filled with water to a verifiable and visible level to 10' above the lowest portions of the system being tested.

2. On multi-level buildings only one floor level shall be tested at a time. Each floor shall be tested from a level below the structure of the floor, or the outlet of the building in the case of the lowest level, to a level of 12 inches above the floor immediately above the floor being tested, or the top of the highest vent in the case of the highest building level. The pipes for the level being tested shall be filled with water to a verifiable and visible level as described above and be allowed to remain so for 24 hours. If after 24 hours the level of the water has been lowered by leakage, the leaks must be found and stopped, and the water level shall again be raised to the level described, and the test repeated until, after a 24 hour retention period, there shall be no perceptible lowering of the water level in the system being tested.
3. Should the completion of these tests leave any reasonable question or doubt of the integrity of the installation, additional tests including peppermint smoke, or other measures shall be performed to demonstrate the reliability of these systems to the complete satisfaction of the Owner's duly authorized representative. Such tests shall be conducted and completed before any joints in plumbing are concealed or made inaccessible.

3.09 COMPLETE FUNCTIONING OF WORK

A. All work reasonably implied as essential to the complete functioning of the systems shown on the Drawings and Specification shall be completed as part of the work of this Division, unless specifically stated otherwise. It is the intention of the Drawings and Specification to establish the type and function of systems but not to set forth each item essential to the functioning of any system. In case of doubt as to the work intended or in the event of amplification or clarification thereof, the Contractor shall call upon the Architect for Supplementary Instructions and Drawings, etc.

**END OF SECTION**

**SECTION 22 11 19 - PLUMBING SPECIALTIES**

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. The Basic Materials and Methods, Section 22 02 00, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

A. The scope of the work shall include the furnishing and complete installation of the specialties covered by this Section, with all appurtenances, ready for the Owner's use.

B. Include the following work in addition to items normally part of this Section:

1. Hose Bibbs and Hydrants
2. Water Hammer Arresters
3. Strainers and Filters
4. Thermostatic Mixing Valves
5. Floor Drains and Floor Sinks
6. Cleanouts
7. Trap Primers

1.03 RELATED WORK

A. Section 22 05 29 – Hangers and Support for Plumbing Piping and Equipment

B. Section 22 10 00 – Plumbing Piping

C. Section 22 30 00 – Plumbing Equipment

D. Section 22 40 00 – Plumbing Fixtures

1.04 REFERENCES

A. ANSI/ASSE 1010 – Performance Requirements for Water Hammer Arresters

B. ANSI/ASSE 1011 – Performance Requirements for Hose Connection Vacuum Breakers

C. ANSI/ASSE 1012 – Performance Requirements for Backflow Preventers with an Intermediate Atmospheric Vent

D. ANSI/ASSE 1013 –- Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers

E. ANSI/ASSE 1015 – Performance Requirements for Double Check Backflow Prevention Assemblies and Double Check Fire Protection Backflow Prevention Assemblies

F. ANSI/ASSE 1019 – Performance Requirements for Wall Hydrants with Backflow Protection and Freeze Resistance

G. ANSI/ASSE 1057 – Performance Requirements for Freeze Resistant Sanitary Yard Hydrants with Backflow Protection

H. ASME A112.6.3 – Floor Drains and Trench Drains

I. ASME A112.6.7 – Sanitary Floor Sinks

J. ASME A112.6.4 – Roof, Deck, and Balcony Drains

K. ASME A112.14.1 – Backwater Valves

L. ASME A112.14.3 – Grease Interceptors

M. ASME/ANSI A112.26.1 – Water Hammer Arresters

N. PDI WH-201 Water Hammer Arresters

O. AWWA C506 – Standard for Backflow Prevention Devices – Reduced Pressure Principle and Double Check Valve Types

P. AWWA C510 – Standard for Double Check Valve Backflow Prevention Assembly

Q. ASSE 1069 – Performance Requirements for Automatic Temperature Control Mixing Valves

R. ASSE 1070 – Performance Requirements for Water Temperature Limiting Devices

S. PDI G-101 – Testing and Rating Procedure for Hydro Mechanical Grease Interceptors

1.05 QUALITY ASSURANCE

A. Manufacturer: For each product specified, provide components by the same manufacturer throughout.

1.06 SUBMITTALS

A. Submit under provisions of Division One.

B. Submit shop drawings and product data under provisions of Division One.

C. Include component sizes, rough-in requirements, service sizes, and finishes.

D. Manufacturer's Installation Instructions: Indicate assembly and support requirements.

1.07 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Division One.

B. Record actual locations of equipment and backflow preventers.

1.08 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Division One.

B. Operation Data: Indicate frequency of treatment required for interceptors and separators.

C. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.

1.09 DELIVERY, STORAGE, AND HANDLING

A. DELIVERY: Deliver clearly labeled specialties to; and store, protect and handle products on site in accordance with the provisions of Division One.

B. TIMING AND COORDINATION: Arrange for delivery of materials to allow for minimum storage time at the project site. Coordinate with the scheduled time of installation.

C. ACCEPTANCE: Accept specialties on site in original factory packaging. Inspect for damage. Damaged specialties shall not be acceptable.

D. STORAGE: Store materials in a clean, dry location, protected from weather and damage.

1.10 EXTRA MATERIALS

A. Furnish under provisions of Division One.

B. Provide two loose keys for hose bibbs and hydrants and spare hose end vacuum breakers.

1.11 REGULATORY REQUIREMENTS

A. Conform to applicable codes for the provision and installation of all required backflow prevention devices.

B. Provide certificate of compliance from authority having jurisdiction indicating approval of installation of backflow prevention devices.

C. Provide backflow prevention assembly test and maintenance report for all devices. A printed and signed form by the licensed tester that performed the work shall be provided both to the Owner and to the Public Water System in accordance with TCEQ (Texas Commission on Environmental Quality) requirements.

PART 2 - PRODUCTS

2.01 HOSE BIBBS/HYDRANTS

A. Hose Bibb: ANSI/ASSE 1011; bronze or brass construction, replaceable hexagonal disc, hose thread spout, chrome plated where exposed, with lockshield and removable key, integral vacuum breaker.

B. Wall Hydrant: ANSI/ASSE 1019; non-freeze, self-draining type with chrome plated lockable recessed box hose thread spout, lockshield and removable key, and vacuum breaker.

C. Floor Hydrant: ANSI/ASSE 1019; chrome plated lockable recessed box, hose thread spout, lockshield and removable key, and vacuum breaker.

D. Roof/Post Hydrant; ANSI/ASSE 1057; bronze non-freeze post hydrant with cast iron casing guard, vacuum breaker, and removable tee handle key.

E. ACCEPTABLE MANUFACTURERS:

1. J.R. Smith
2. Zurn
3. Mifab
4. Watts
5. Wade
6. Josam
7. Chicago
8. Woodford

2.02 RECESSED VALVE BOX

A. Washing Machine: Pre-formed galvanized or stainless steel rough-in box with brass long shank valves with wheel handles, threaded drain fitting for waste, and matching secured faceplate.

B. Refrigerator: Pre-formed galvanized or stainless steel rough-in box with brass long shank valve with wheel or quarter-turn handle and matching secured faceplate.

C. ACCEPTABLE MANUFACTURERS:

1. Guy Gray
2. Mifab
3. Sioux Chief
4. Oatey

## 2.03 WATER HAMMER ARRESTERS

A. ASSE 1010; sized and located in accordance with PDI WH-201; pre-charged, approved mechanical devices suitable for operation in temperature range -100 to 300 degrees F -73 to 149 degrees C and maximum 250 psig (1700 kPa) working pressure.

B. ACCEPTABLE MANUFACTURERS:

1. J.R. Smith
2. Zurn
3. Mifab
4. Watts
5. Wade
6. Josam
7. P.P.P.
8. Sioux Chief

## 2.04 THERMOSTATIC MIXING VALVES

A. Provide thermostatic mixing valves in accordance with manufacturer's recommendations and as indicated and scheduled on Drawings.
   1. Unless scheduled otherwise, all units other than under-counter point of use units shall be provided complete in lockable cabinet of 16 gage (1.5 mm) prime coated steel when located in finished areas.
   2. All under-counter point of use units shall be provided complete with integral checks and dual stainless steel strainers on inlets for protection against fouling.

B. ACCEPTABLE MANUFACTURERS:

1. Bradley
2. Powers
3. Symmons
4. Acorn

## 2.05 FLOOR DRAINS AND FLOOR SINKS

A. Provide floor drains and floor sinks in accordance with manufacturer's recommendations, as appropriate for floor construction, and as indicated and scheduled on Drawings.

B. Provide clamping devices for all drains in membrane floor areas.

C. ACCEPTABLE MANUFACTURERS:

1. J.R. Smith

2. Zurn
3. Mifab
4. Watts
5. Wade
6. Josam

D. Provide drains of suitable and compatible material for specialized piping systems conveying acid waste.

2.06 CLEANOUTS

A. General: Provide cleanouts as indicated and scheduled on Drawings and also as required by the prevailing code, whether shown on the Drawings or not.

B. Construction: All cleanouts shall have tapered bronze plugs.

C. Provide clamping devices for all cleanouts in membrane floor areas.

D. Provide cleanouts of suitable and compatible material for specialized piping systems conveying acid waste.

E. Types:

1. Finished floor cleanouts: Provide cast iron body, with adjustable floor level assembly, and round nickel bronze scoriated top.
2. Resilient or tile finished floor cleanouts: Provide cast iron body, with adjustable floor level assembly, and round nickel-bronze top with gasketed water tight cover and depressed top to receive flooring finish material.
3. Interior finished wall cleanouts: Provide cast iron tee body or cleanout ferrule as required for wall construction and provide counter-sunk bronze plug with stainless steel access cover and securing screw(s).
4. Interior unfinished accessible cleanouts: Calked or threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.

F. ACCEPTABLE MANUFACTURERS:

1. J.R. Smith
2. Zurn
3. Mifab
4. Watts
5. Wade
6. Josam

2.07 TRAP PRIMERS

A. General: Provide trap primers as indicated and scheduled on Drawings and in accordance with manufacturer’s recommendations.

B. ACCEPTABLE MANUFACTURERS:

1. J.R. Smith
2. Zurn
3. Mifab
4. Watts
5. Wade
6. Josam
7. P.P.P.
8. Sioux Chief

## PART 3 - EXECUTION

### 3.01 INSTALLATION AND APPLICATION

A. Install specialties in accordance with manufacturer's instructions to provide intended performance.

B. The contractor shall provide water hammer arresters as shown on Drawings and also in accordance with PDI Standard WH-201, whether shown on Drawings or not. Water hammer arresters shall be PDI certified and sized and placed as recommended by manufacturer. Provide above ceiling or otherwise accessible location complete with isolation valve to facilitate replacement.

C. The use of air chambers for the control of water hammer shock shall not be acceptable.

D. Provide strainers at all backflow preventers.

E. Contractor shall certify all newly installed backflow preventers and provide proof of certification to the Owner.

F. Pipe relief line from backflow preventer via manufacturer’s air gap assembly, full size to nearest drain. Such routing shall not pose a trip hazard.

G. All backflow preventers shall be securely supported with wall supports and/or pipe stands as appropriate for the size and weight of the unit and shall be installed with sufficient access and clearance for testing and maintenance. Unless specifically noted otherwise on Drawings, all backflow preventers shall be installed at 48”-60” above finished floor.

H. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanouts for rodding of drainage system.

I. All cleanouts outside of building on grade shall be set in an 18" x 18" x 4" thick concrete pad, flush with final grade/paving.

J. All cleanouts shall be the same nominal size as the pipe they serve, up to 4 inches. For pipes larger than 4 inches, provide a 4 inch cleanout.

K. Coordinate with casework to ensure that all interceptors are readily accessible and removable for servicing and cleaning.

L. Coordinate with casework to ensure that all point of use interceptors do not interfere with required accessibility requirements. Provide offset(s) as required and in accordance with code.

M. Provide approved sampling well downstream of centralized interceptors and separators.

**END OF SECTION**

**SECTION 22 30 00 - PLUMBING EQUIPMENT**

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Water Heaters.

1.02 RELATED SECTIONS

A. Section 22 05 29 – Hangers and Support for Plumbing Piping and Equipment.

B. Section 22 05 48 – Vibration and Seismic Controls for Plumbing Equipment.

C. Section 22 10 00 - Plumbing Piping.

D. Section 22 11 19 - Plumbing Specialties.

E. Section 26 05 19 - Wire, Cable, and Related Materials.

1.03 REFERENCES

A. ANSI/ASHRAE 90A - Energy Conservation in New Building Design.

B. ASME Section VIIID - Pressure Vessels; Boiler and Pressure Vessel Codes.

C. ANSI/NFPA 54 - National Fuel Gas Code.

D. ANSI/NFPA 70 - National Electrical Code.

E. ANSI/UL 1453 - Electric Booster and Commercial Storage Tank Water Heaters.

1.04 SUBMITTALS

A. Submit under provisions of Division One.

B. Shop Drawings:

1. Include water heater dimensions. size of tappings, and performance data.
2. Include dimensions of tanks, tank lining methods, anchors, attachments, lifting points, tappings, and drains.

C. Product Data:

1. Include dimension drawings of water heaters indicating components and connections to other equipment and piping.
2. Indicate pump type, capacity, power requirements, and affected adjacent construction.
3. Submit certified pump curves showing pump performance characteristics with pump and system operating point plotted. Include NPSH curve when applicable.

4. Provide electrical characteristics and connection requirements.

D. Manufacturer's Installation Instructions.

1.05 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Division 22.

B. Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.

1.06 QUALITY ASSURANCE

A. Perform Work in accordance with authorities having jurisdiction.

B. Ensure products and installation of specified products are in conformance with recommendations and requirements of the following organizations:

1. American Gas Association (AGA).
2. National Sanitation Foundation (NSF).
3. American Society of Mechanical Engineers (ASME).
4. National Board of Boiler and Pressure Vessel Inspectors (NBBPVI).
5. National Electrical Manufacturers' Association (NEMA).
6. Underwriters Laboratories (UL).
7. American Society of Plumbing Engineers (ASPE)

1.07 REGULATORY REQUIREMENTS

A. Conform to AGA NSF ANSI/NFPA 54 ANSI/NFPA 70 ANSI/UL 1453 requirements for water heaters.

B. Conform to ASME Section VIIID for manufacture of pressure vessels for heat exchangers.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section Division One.

B. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

1.09 WARRANTY

A. Provide five year warranty under provisions of Division One.

B. Warranty: Include coverage of domestic water heaters, water storage tanks, and packaged water heating systems.

1.10 EXTRA MATERIALS

A. Furnish under provisions of Division One.

B. Provide two sets of electric heater elements.

1.11 OPERATIONS PERSONNEL TRAINING

A. Provide a training session for the owner's operations personnel. Training session shall be performed by a qualified person who is knowledgeable in the subject system/equipment. Submit a training agenda two weeks prior to the proposed training session for review and approval. Training session shall include at the minimum:

8. Purpose of equipment.
9. Principle of how the equipment works
10. Important parts and assemblies
11. How the equipment achieves its purpose and necessary operating conditions
12. Most likely failure modes, causes and corrections
13. On site demonstration

PART 2 - PRODUCTS

2.01 RESIDENTIAL ELECTRIC WATER HEATER

A. Manufacturers:

1. Eemax.
2. Other acceptable manufacturers offering equivalent products.
   a. Chronomite
   b. Stiebel Eltron

B. Type: Point of use, tankless, electric.

C. Construction: Factory-assembled and wired. Nickel-chrome elements, high-impact plastic housing with removable cover. Plastic hot and cold water connection points are not acceptable. Provide with replaceable cold water inlet filter screen.

D. Controls: Flow switch operated, complete with a safety high-limit switch with manual reset, and field adjustable outlet temperature.

PART 3 - EXECUTION

3.01 WATER HEATER INSTALLATION

A. Install water heaters in accordance with manufacturer's instructions and to AGA NSF ANSI/NFPA 54 UL requirements.

B. Coordinate with plumbing piping and related work to achieve operating system.

**END OF SECTION**

**SECTION 22 40 00 - PLUMBING FIXTURES**

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. The Basic Materials and Methods, Section 22 02 00, are included as a part of this Section as though written in full in this document.

1.02 SCOPE

A. The scope of the work shall include the furnishing and complete installation of the fixtures covered by this Section, with all appurtenances, ready for the Owner's use.

B. Include the following work in addition to items normally part of this Section:

1. Plumbing Fixtures
2. Fixture Carriers
3. Faucets, Supplies, and Trim
4. Flushometers

1.03 RELATED WORK

A. Section 22 05 29 – Hangers and Support for Plumbing Piping and Equipment

B. Section 22 10 00 – Plumbing Piping

C. Section 22 11 19 – Plumbing Specialties

D. Section 22 30 00 – Plumbing Equipment

1.04 REFERENCES

A. ASME A112.4.3 – Plastic Fittings for Connecting Water Closets to the Sanitary Drainage System

B. ASME A112.6.1M – Floor Affixed Supports for Off-the-Floor Plumbing Fixtures for Public Use

C. ASME A112.18.1 – Plumbing Supply Fittings

D. ASME A112.18.2 – Plumbing Waste Fittings

E. ASME A112.18.9 – Protectors/Insulators for Exposed Waste and Supplies on Accessible Fixtures

F. ASME A112.19.1 – Enameled Cast Iron and Enameled Steel Plumbing Fixtures

G. ASME A112.19.2 – Ceramic Plumbing Fixtures

H. ASME A112.19.3 – Stainless Steel Plumbing Fixtures

I. ASME A112.19.7 – Hydromassage Bathtub Systems

J. NSF/ANSI 61 – Drinking Water System Components – Health Effects

K. ANSI Z358.1 – Emergency Eyewash and Shower Equipment

L. ASSE 1016 – Performance Requirements for Individual Thermostatic, Pressure Balancing, and Combination Pressure Balancing and Thermostatic Control Valves for Individual Fixture Fittings.

M. ASSE 1037 – Performance Requirements for Pressurized Flushing Devices for Plumbing Fixtures

N. ADA (Americans with Disabilities Act)

O. TAS (Texas Accessibility Standards)

1.05 QUALITY ASSURANCE

A. Manufacturer: For each product specified, provide components by the same manufacturer throughout.

B. Warranty: Warrant the work specified herein for one year against becoming unserviceable or causing an objectionable appearance resulting from defective or non-conforming materials and workmanship.

C. Defects shall include, but not necessarily be limited to, the following:

1. Noisy operation.
2. Noticeable deterioration of finish.
3. Leakage of water.

1.06 SUBMITTALS

A. Submit under provisions of Division One.

B. Submit product data under provisions of Division One.

C. Include component sizes, rough-in requirements, service sizes, finishes, materials, dimensions, performance information, and accessories.

D. Manufacturer’s Installation Instructions: Indicate assembly and support requirements.

1.07 OPERATION AND MAINTENANCE DATA

A. Submit under provisions of Division One.

B. Provide pre-printed operating and maintenance instructions for each item specified. Instruct and demonstrate the proper operation and maintenance to the Owner's designated representative.

1.08 DELIVERY, STORAGE, AND HANDLING

A. DELIVERY: Deliver clearly labeled specialties to; and store, protect and handle products on site in accordance with the provisions of Division One.

B. TIMING AND COORDINATION: Arrange for delivery of materials to allow for minimum storage time at the project site. Coordinate with the scheduled time of installation.

C. ACCEPTANCE: Accept specialties on site in original factory packaging. Inspect for damage. Damaged specialties shall not be acceptable.

D. STORAGE: Store materials in a clean, dry location, protected from weather and damage.

1.09 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on the Contract Documents.

B. Confirm and field coordinate that millwork is constructed with adequate provisions for the installation of counter top lavatories and sinks.

PART 2 – PRODUCTS

2.1 MATERIALS

A. PLUMBING FIXTURES:

1. GENERAL: Provide plumbing fixtures as specified on drawings; NO deviations.
2. CHAIR CARRIERS: ANSI/ASME A112.6.1.; Adjustable cast iron frame, integral drain hub and vent, adjustable spud, lugs for floor and wall attachment, threaded fixture studs with nuts and washers. As manufactured by Zurn, J. R. Smith, Josam or Wade.
3. URINAL WALL SUPPORTS: ANSI/ASME A112.6.1; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded fixture studs for fixture hanger, bearing studs. As manufactured by Zurn, J. R. Smith, Josam or Wade.
4. TRAPS, STOPS AND RISERS: Braided stainless steel as manufactured by McGuire, Chicago or Zurn.

B. CLEANOUTS:

1. GENERAL: Provide cleanouts as shown on Drawings and as required by the city building code.
2. ACCEPTABLE MANUFACTURERS: Zurn, J. R. Smith, Mifab, Josam and Wade.
3. TYPES:
   a. FINISHED FLOOR CLEANOUTS: Provide cast iron, adjustable floor level assembly with nickel bronze top and gasket cover.
   b. RESILIENT OR TILE FINISHED FLOOR CLEANOUTS: Provide cast iron, adjustable assembly with nickel-bronze top with gasketed water tight cover and depressed top to receive flooring finish material.
   c. DRY WALL CLEANOUTS: Provide cast iron tee and counter sink bronze plug with nickel bronze frame and stainless steel cover.
   d. Provide membrane clamp rings for slab on grade cleanouts.
   e. All cleanouts shall have tapered bronze plugs.

## PART 3 - EXECUTION

### 3.1 PREPARATION

A. EXAMINATION OF CONDITIONS: Examine conditions affecting this Work. Report unsatisfactory conditions to the proper authority and do not proceed until those conditions have been corrected. Commencing Work implies acceptance of existing conditions as satisfactory to the outcome of this Work.

### 3.2 INSTALLATION

A. Install fixtures in locations and heights as shown on Drawings or as directed by the Architect.

B. Install materials plumb, level, securely, and in accordance with manufacturer's recommendations.

C. All rough-in pipe openings, for final connections with all supply waste soil and vent systems shall be closed with caps or plugs during early stages of construction and installation. Tape shall not be considered sufficient protection.

D. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

E. Provide ball valves in piping serving batteries of fixtures. Label stops "Hot" and "Cold." Valves to be located above accessible ceiling. If ceiling are not accessible, provide access

panels of adequate size to make valves fully accessible.

F. Plumbing fixtures shall be supported by a concealed chair carrier where required to properly support the fixture specified. All carriers to be securely mounted, bolted and checked prior to concealment.

G. Caulk around fixtures with best grade white silicone caulking. Do not use grout.

H. All handles on supply and drainage fittings or other brass items shall be properly lined up and adjusted. Fittings shall not be left in any haphazard manner.

I. All fixtures shall have individual chrome plated heavy pattern loose key quarter-turn cutoff stops on supply lines. Where same are not specified as a part of the fixture trim, they shall be installed as close to fixtures as possible in the hot and cold water supply.

J. Install each fixture with trap, easily removable for servicing and cleaning.

K. Provide chrome plated rigid or flexible supplies to fixtures with loose key quarter-turn stops, reducers, and escutcheons.

L. The contractor shall install water hammer arrestors. Water hammer arrestors shall be PDI Certified and sized and placed as recommended by manufacture. Provide an accessible isolation valve and proper access to arrestor for replacement.

## 3.3 INTERFACE WITH OTHER PRODUCTS

A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

## 3.4 ADJUSTING

A. Adjust work under provisions of Division One.

B. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

## 3.5 CLEANING

A. Clean work under provisions of Division One.

B. At completion clean plumbing fixtures and equipment.

3.6 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of Division One.

B. Do not permit use of fixtures.

3.7 ADA ACCESSIBLE FIXTURES

A. Install fixtures to heights, indicated on architectural drawings.

B. Handicapped fixtures shall be installed to required heights, shall be of types suitable for, and supplied with controls properly installed, to comply with requirements as directed by ADA Accessibility of Federal Registry, Part III, Department of Justice 28 CFR 36 and comply with all state and local ADA Code requirements.

C. Exposed accessible sink or lavatory p-trap and angle valve assemblies shall be insulated with the fully molded, Truebro, Handi Lav-guard insulation kit. Provide the proper model for fixtures specified. All kits shall be White or as selected by Architect.

**END OF SECTION**

**SECTION 23 02 00 - BASIC MATERIALS AND METHODS**

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all Work herein..

B. The Contract Drawings indicate the extent and general arrangement of the systems. If any departure from the Contract Drawings is deemed necessary by the Contractor, details of such departures and the reasons therefore, shall be submitted to the Architect/Engineer for review as soon as practicable. No such departures shall be made without the prior written approval of the Architect/Engineer.

C. Notwithstanding any reference in the Specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, such reference shall not be construed as limiting competition; and the Contractor, in such cases, may at his option use any article, device, product, material, fixture, form or type of construction which in the judgment of the Architect/Engineer, expressed in writing, is the equivalent of that specified.

1.2 SCOPE OF WORK

A. The Work included under this Contract consists of the furnishing and installation of all equipment and material necessary and required to form complete and functioning systems in all of their various phases, all as shown on the accompanying Drawings and/or described in these Specifications. The Contractor shall review all pertinent drawings, including those of other contracts, prior to commencement of Work.

B. This Division requires the furnishing and installing of all items as specified herein, indicated on the Drawings or reasonably inferred as necessary for safe and proper operation; including every article, device or accessory (whether or not specifically called for by item) reasonably necessary to facilitate each system's functioning as indicated by the design and the equipment specified. Elements of the work include, but are not limited to, materials, labor, supervision, transportation, storage, equipment, utilities, all required permits, licenses and inspections. All work performed under this Section shall be in accordance with the Project Manual, Drawings and Specifications and is subject to the terms and conditions of the Contract.

C. The approximate locations of Mechanical (HVAC) items are indicated on the Drawings. These Drawings are not intended to give complete and accurate details in regard to location of outlets, apparatus, etc. Exact locations are to be determined by actual measurements at the building, and will in all cases be subject to the review of the Owner or Engineer, who reserves the right to make any reasonable changes in the locations indicated without additional cost to the Owner.

D. Items specifically mentioned in the Specifications but not shown on the Drawings and/or items shown on Drawings but not specifically mentioned in the Specifications shall be installed by the Contractor under the appropriate section of work as if they were both

specified and shown.

E. All discrepancies between the Contract Documents and actual job-site conditions shall be reported to the Owner or Engineer so that they will be resolved prior to bidding. Where this cannot be done at least 7 working days prior to bid; the greater or more costly of the discrepancy shall be bid. All labor and materials required to perform the work described shall be included as part of this Contract.

F. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and fully operating system in cooperation with other trades.

G. It is the intent of the above "Scope" to give the Contractor a general outline of the extent of the Work involved; however, it is not intended to include each and every item required for the Work. Anything omitted from the "Scope" but shown on the Drawings, or specified later, or necessary for a complete and functioning heating, ventilating and air conditioning system shall be considered a part of the overall "Scope".

H. The Contractor shall rough-in fixtures and equipment furnished by others from rough-in and placement drawings furnished by others. The Contractor shall make final connection to fixtures and equipment furnished by others.

I. The Contractor shall participate in the commissioning process as required; including, but not limited to, meeting attendance, completion of checklists, and participation in functional testing.

1.3 SCHEMATIC NATURE OF CONTRACT DOCUMENTS

A. The Contract Documents are schematic in nature in that they are only to establish scope and a minimum level of quality. They are not to be used as actual working construction drawings. The actual working construction drawings shall be the reviewed shop drawings.

B. All duct or pipe or equipment locations as indicated on the documents do not indicate every transition, offset, or exact location. All transitions, offsets, clearances and exact locations shall be established by actual field measurements, coordination with the structural, architectural and reflected ceiling plans, and other trades. Submit shop drawings for review.

C. All transitions, offsets and relocations as required by actual field conditions shall be performed by the Contractor at no additional cost to the Owner.

D. Additional coordination with electrical contractor may be required to allow adequate clearances of electrical equipment, fixtures and associated appurtenances. Contractor to notify Architect and Engineer of unresolved clearances, conflicts or equipment locations.

1.4 SITE VISIT AND FAMILIARIZATION

A. Before submitting a bid, it will be necessary for each Contractor whose work is involved to visit the site and ascertain for himself the conditions to be met therein in installing his

work and make due provision for same in his bid. It will be assumed that this Contractor in submitting his bid has visited the premises and that his bid covers all work necessary to properly install the equipment shown. Failure on the part of the Contractor to comply with this requirement shall not be considered justification for the omission or faulty installation of any work covered by these Specifications and Drawings.

B. Understand the existing utilities from which services will be supplied; verify locations of utility services, and determine requirements for connections.

C. Determine in advance that equipment and materials proposed for installation fit into the confines indicated.

1.5 WORK SPECIFIED IN OTHER SECTIONS

A. Finish painting is specified. Prime and protective painting are included in the work of this Division.

B. Owner and General Contractor furnished equipment shall be properly connected to Mechanical (HVAC) systems.

C. Furnishing and installing all required Mechanical (HVAC) equipment control relays and electrical interlock devices, conduit, wire and J-boxes are included in the Work of this Division.

1.6 PERMITS, TESTS, INSPECTIONS

A. Arrange and pay for all permits, fees, tests, and all inspections as required by governmental authorities.

1.7 DATE OF FINAL ACCEPTANCE

A. The date of final acceptance shall be the date of Owner occupancy, or the date all punch list items have been completed, or the date final payment has been received. Refer to Division One for additional requirements.

B. The date of final acceptance shall be documented in writing and signed by the Architect, Owner and Contractor.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

B. Deliver products to the project at such time as the project is ready to receive the equipment, pipe or duct - properly protected from incidental damage and weather damage.

C. Damaged equipment, duct or pipe shall be promptly removed from the site and new, undamaged equipment, pipe or duct shall be installed in its place promptly with no

additional charge to the Owner.

1.9 NOISE AND VIBRATION

A. The heating, ventilating and air conditioning systems, and the component parts thereof, shall be guaranteed to operate without objectionable noise and vibration.

B. Provide foundations, supports and isolators as specified or indicated, properly adjusted to prevent transmission of vibration to the building structure, piping and other items.

C. Carefully fabricate ductwork and fittings with smooth interior finish to prevent turbulence and generation or regeneration of noise.

D. All equipment shall be selected to operate with minimum of noise and vibration. If, in the opinion of the Architect, objectionable noise or vibration is produced or transmitted to or through the building structure by equipment, piping, ducts or other parts of the Work, the Contractor shall rectify such conditions without extra cost to the Owner.

1.10 APPLICABLE CODES

A. Obtain all required permits and inspections for all work required by the Contract Documents and pay all required fees in connection thereof.

B. Arrange with the serving utility companies for the connection of all required utilities and pay all charges, meter charges, connection fees and inspection fees, if required.

C. Comply with all applicable codes, specifications, local ordinances, industry standards, utility company regulations and the applicable requirements which includes and is not limited to the following nationally accepted codes and standards:

1. Air Moving & Conditioning Association, AMCA.
2. American Standards Association, ASA.
3. American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc., ASHRAE.
4. American Society of Mechanical Engineers, ASME.
5. American Society of Plumbing Engineers, ASPE.
6. American Society of Testing Materials, ASTM.
7. American Water Works Association, AWWA.
8. National Bureau of Standards, NBS.
9. National Fire Protection Association, NFPA.
10. Sheet Metal & Air Conditioning Contractors' National Association, SMACNA.
11. Underwriters' Laboratories, Inc., UL.
12. International Energy Conservation Code, IECC.
13. International Fire Code.
14. International Gas Code.

D. Where differences existing between the Contract Documents and applicable state or city building codes, state and local ordinances, industry standards, utility company regulations and the applicable requirements of the nationally accepted codes and standards, the more stringent or costly application shall govern. Promptly notify the Engineer in writing of

all differences.

E. When directed in writing by the Engineer, remove all work installed that does not comply with the Contract Documents and applicable state or city building codes, state and local ordinances, industry standards, utility company regulations and the applicable requirements of the above listed nationally accepted codes and standards, correct the deficiencies, and complete the work at no additional cost to the Owner.

1.11 DEFINITIONS AND SYMBOLS

A. General Explanation: A substantial amount of construction and Specification language constitutes definitions for terms found in other Contract Documents, including Drawings which must be recognized as diagrammatic and schematic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in Contract Documents are defined generally in this article, unless defined otherwise in Division 01.

B. Definitions and explanations of this Section are not necessarily either complete or exclusive, but are general for work to the extent not stated more explicitly in another provision of the Contract Documents.

C. Indicated: The term "Indicated" is a cross-reference to details, notes or schedules on the Drawings, to other paragraphs or schedules in the Specifications and to similar means of recording requirements in Contract Documents. Where such terms as "Shown", "Noted", "Scheduled", "Specified" and "Detailed" are used in lieu of "Indicated", it is for the purpose of helping the reader locate cross-reference material, and no limitation of location is intended except as specifically shown.

D. Directed: Where not otherwise explained, terms such as "Directed", "Requested", "Accepted", and "Permitted" mean by the Architect or Engineer. However, no such implied meaning will be interpreted to extend the Architect's or Engineer's responsibility into the Contractor's area of construction supervision.

E. Reviewed: Where used in conjunction with the Engineer's response to submittals, requests for information, applications, inquiries, reports and claims by the Contractor the meaning of the term "Reviewed" will be held to limitations of Architect's and Engineer's responsibilities and duties as specified in the General and Supplemental Conditions. In no case will "Reviewed" by Engineer be interpreted as a release of the Contractor from responsibility to fulfill the terms and requirements of the Contract Documents.

F. Furnish: Except as otherwise defined in greater detail, the term "Furnish" is used to mean supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.

G. Install: Except as otherwise defined in greater detail, the term "Install" is used to describe operations at the project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance.

H. Provide: Except as otherwise defined in greater detail, the term "Provide" is used to mean "Furnish and Install", complete and ready for intended use, as applicable in each

instance.

I. Installer: Entity (person or firm) engaged by the Contractor, or its Subcontractor or Sub-subcontractor for performance of a particular unit of work at the project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance. It is a general requirement that such entities (Installers) be expert in the operations they are engaged to perform.

J. Imperative Language: Used generally in Specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by the Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor or, when so noted, by other identified installers or entities.

K. Minimum Quality/Quantity: In every instance, the quality level or quantity shown or specified is intended as minimum quality level or quantity of work to be performed or provided. Except as otherwise specifically indicated, the actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable tolerance limits. In complying with requirements, indicated or scheduled numeric values are either minimums or maximums as noted or as appropriate for the context of the requirements. Refer instances of uncertainty to Owner or Engineer via a request for information (RFI) for decision before proceeding.

L. Abbreviations and Symbols: The language of Specifications and other Contract Documents including Drawings is of an abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self explanatory nature have been included in text of Specifications and Drawings. Specific abbreviations and symbols have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of Specification requirements with notations on Drawings and in Schedules. These are frequently defined in Section at first instance of use or on a Legend and Symbol Drawing. Trade and industry association names and titles of generally recognized industry standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of Contract Documents so indicate. Except as otherwise indicated, graphic symbols and abbreviations used on Drawings and in Specifications are those recognized in construction industry for indicated purposes. Where not otherwise noted symbols and abbreviations are defined by the latest ASHRAE Fundamentals Handbook, chapter 34 "Abbreviations and Symbols", ASME and ASPE published standards.

1.12 DRAWINGS AND SPECIFICATIONS

A. These Specifications are intended to supplement the Drawings and it will not be the province of the Specifications to mention any part of the Work which the Drawings are competent to fully explain in every particular and such omission is not to relieve the Contractor from carrying out portions indicated on the Drawings only.

B. Should items be required by these Specifications and not indicated on the Drawings, they are to be supplied even if of such nature that they could have been indicated thereon. In

case of disagreement between Drawings and Specifications, or within either Drawings or Specifications, the better quality or greater quantity of work shall be estimated and the matter referred to the Architect or Engineer for review with a request for information and clarification at least 7 working days prior to bid opening date for issuance of an addendum.

C. The listing of product manufacturers, materials and methods in the various sections of the Specifications, and indicated on the Drawings, is intended to establish a standard of quality only. It is not the intention of the Owner or Engineer to discriminate against any product, material or method that is the equivalent of the standards as indicated and/or specified, nor is it intended to preclude open, competitive bidding. The fact that a specific manufacturer is listed as an acceptable manufacturer should not be interpreted to mean that the manufacturer's standard product will meet the requirements of the project design, Drawings, Specifications and space constraints.

D. The Architect or Engineer and Owner shall be the sole judge of quality and equivalence of equipment, materials and methods.

E. Products by other reliable manufacturers, other materials, and other methods, will be accepted as outlined, provided they have equivalent capacity, construction, and performance. However, under no circumstances shall any substitution be made without the written permission of the Architect or Engineer and Owner. Request for prior approval must be made in writing 10 days prior to the bid date without fail.

F. Wherever a definite product, material or method is specified and there is not a statement that another product, material or method will be acceptable, it is the intention of the Owner or Engineer that the specified product, material or method is the only one that shall be used without prior approval.

G. Wherever a definite material or manufacturer's product is specified and the Specification states that products of similar design and equivalent construction from the specified list of manufacturers may be substituted, it is the intention of the Owner or Engineer that products of manufacturers that are specified are the only products that will be acceptable and that products of other manufacturers will not be considered for substitution without approval.

H. Wherever a definite product, material or method is specified and there is a statement that "OR EQUIVALENT" product, material or method will be acceptable, it is the intention of the Owner or Engineer that the specified product, material or method or an "OR EQUIVALENT" product, material or method may be used if it complies with the Specifications and is submitted for review to the Engineer as outline herein.

I. Where permission to use substituted or alternative equipment on the project is granted by the Owner or Engineer in writing, it shall be the responsibility of the Contractor or Subcontractor involved to verify that the equipment will fit in the space available which includes allowances for all required Code and maintenance clearances, and to coordinate all equipment structural support, plumbing and electrical requirements and provisions with the Mechanical (HVAC) Design Documents and all other trades, including Division 26.

J. Changes in architectural, structural, electrical, mechanical, and plumbing requirements for the substitution shall be the responsibility of the bidder wishing to make the substitution. This shall include the cost of redesign by the affected designer(s). Any additional cost incurred by affected Subcontractors shall be the responsibility of this bidder and not the Owner.

K. If any request for a substitution of product, material or method is rejected, the Contractor will automatically be required to furnish the product, material or method named in the Specifications. Repetitive requests for substitutions will not be considered.

L. The Owner or Engineer will investigate all requests for substitutions when submitted in accordance with the requirements listed above; and if accepted, will issue a letter allowing the substitutions.

M. Where equipment other than that used in the design as specified or shown on the Drawings is substituted (either from an approved manufacturers list or by submittal review), it shall be the responsibility of the substituting Contractor to coordinate space requirements, building provisions and connection requirements with his trades and all other trades; and to pay all additional costs to other trades, the Owner, the Architect or Engineer, if any, due to the substitutions.

1.13 SUBMITTALS

A. Coordinate with Division 01 for submittal timetable requirements. Within thirty (30) days, unless noted otherwise, after the Contract is awarded the Contractor shall submit a minimum of eight (8) complete bound sets of shop drawings and complete data covering each item of equipment or material. The first submittal of each item requiring a submittal must be received by the Architect or Engineer within the above thirty day period. The Architect or Engineer shall not be responsible for any delays or costs incurred due to excessive shop drawing review time for submittals received after the thirty (30) day time limit. The Architect and Engineer will retain one (1) copy each of all shop drawings for their files. Where full size drawings are involved, submit one (1) print and one (1) reproducible sepia or mylar in lieu of eight (8) sets. All literature pertaining to an item subject to Shop Drawing submittal shall be submitted at one time. A submittal shall not contain information from more than one Specification section, but may have a section subdivided into items or equipment as listed in each section. The Contractor may elect to submit each item or type of equipment separately. Each submittal shall include the following items enclosed in a suitable binder:

1. A cover sheet with the names and addresses of the Project, Architect, MEP Engineer, General Contractor and the Subcontractor making the submittal. The cover sheet shall also contain the section number covering the item or items submitted and the item nomenclature or description.
2. An index page with a listing of all data included in the Submittal.
3. A list of variations page with a listing of all variations, including unfurnished or additional required accessories, items or other features, between the submitted equipment and the specified equipment. If there are no variations, then this page shall state "NO VARIATIONS". Where variations affect the work of other Contractors, then the Contractor shall certify on this page that these variations have been fully coordinated with the affected Contractors and that all expenses

associated with the variations will be paid by the submitting Contractor. This page will be signed by the submitting Contractor.

4. Equipment information including manufacturer's name and designation, size, performance and capacity data as applicable. All applicable Listings, Labels, Approvals and Standards shall be clearly indicated.
5. Dimensional data and scaled drawings as applicable to show that the submitted equipment will fit the space available with all required Code and maintenance clearances clearly indicated and labeled at a minimum scale of 1/4" = 1'-0", as required to demonstrate that the alternate or substituted product will fit in the space available.
6. Identification of each item of material or equipment matching that indicated on the Drawings.
7. Sufficient pictorial, descriptive and diagrammatic data on each item to show its conformance with the Drawings and Specifications. Any options or special requirements or accessories shall be so indicated. All applicable information shall be clearly indicated with arrows or another approved method.
8. Additional information as required in other Sections of this Division.
9. Certification by the General Contractor and Subcontractor that the material submitted is in accordance with the Drawings and Specifications, signed and dated in long hand. Submittals that do not comply with the above requirements shall be returned to the Contractor and shall be marked "REVISE AND RESUBMIT".

B. Refer to Division 00 and Division 01 for additional information on shop drawings and submittals.

C. Equipment and materials submittals and shop drawings will be reviewed for compliance with design concept only. It will be assumed that the submitting Contractor has verified that all items submitted can be installed in the space allotted. Review of shop drawings and submittals shall not be considered as a verification or guarantee of measurements or building conditions.

D. Where shop drawings and submittals are marked "REVIEWED", the review of the submittal does not indicate that submittals have been checked in detail nor does it in any way relieve the Contractor from his responsibility to furnish material and perform work as required by the Contract Documents.

E. Shop drawings shall be reviewed and returned to the Contractor with one of the following categories indicated:

1. REVIEWED: Contractor need take no further submittal action, shall include this submittal in the O&M manual and may order the equipment submitted on.
2. REVIEWED AS NOTED: Contractor shall submit a letter verifying that required exceptions to the submittal have been received and complied with including additional accessories or coordination action as noted, and shall include this submittal and compliance letter in the O&M manual. The contractor may order the equipment submitted on at the time of the returned submittal providing the Contractor complies with the exceptions noted.
3. NOT APPROVED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is not

approved. The Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or Drawings. Contractor shall not order equipment that is not approved. Repetitive requests for substitutions will not be considered.

4. REVISE AND RESUBMIT: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked revise and resubmit. The Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or provide as noted on previous shop drawings. Contractor shall not order equipment marked revise and resubmit. Repetitive requests for substitutions will not be considered.
5. CONTRACTOR'S CERTIFICATION REQUIRED: Contractor shall resubmit submittal on material, equipment or method of installation. The Contractor's stamp is required stating that the submittal meets all conditions of the Contract Documents. The stamp shall be signed by the General Contractor. The submittal will not be reviewed if the stamp is not placed and signed on all shop drawings.
6. MANUFACTURER NOT AS SPECIFIED: Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked manufacturer not as specified. The Contractor will automatically be required to furnish the product, material or method named in the Specifications. Contractor shall not order equipment when submittal is marked manufacturer not as specified. Repetitive requests for substitutions will not be considered.

F. Materials and equipment which are purchased or installed without submittal review shall be at the risk of the Contractor and the cost for removal and replacement of such materials and equipment and related work which is judged unsatisfactory by the Owner or Engineer for any reason shall be at the expense of the Contractor. The responsible Contractor shall remove the material and equipment noted above and replace with specified equipment or material at his own expense when directed in writing by the Architect or Engineer.

G. Shop Drawing Submittals shall be complete and checked prior to submission to the Engineer for review.

H. Submittals are required for, but not limited to, the following items:

1. Basic Materials..
2. Variable Air Volume Boxes.
3. Noise and Vibration Controls.
4. HVAC Pipe and Duct Insulation.
5. Portable Pipe Hangers and Equipment Supports.
6. Duct Specialties.
7. Duct Fabrication Drawings.
8. Air Distribution Devices.
9. Filters.
10. Fire Dampers and Fire Smoke Dampers.
11. Temperature Controls and Control Sequences.
12. Test, Adjust and Balance Reports.
13. Testing, Adjusting and Balancing Contractor Qualifications.

14. Coordination Drawings.

I. Refer to other Division 23 sections for additional submittal requirements. Provide samples of actual materials and/or equipment to be used on the Project upon request of the Owner or Engineer.

1.14 COORDINATION DRAWINGS

A. Prepare coordination drawings to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access, and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:

1. Indicate the proposed locations of pipe, duct, equipment, and other materials. Include the following:
   a. Wall and type locations.
   b. Clearances for installing and maintaining insulation.
   c. Locations of light fixtures and sprinkler heads.
   d. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
   e. Equipment connections and support details.
   f. Exterior wall and foundation penetrations.
   g. Routing of storm and sanitary sewer piping.
   h. Fire-rated wall and floor penetrations.
   i. Sizes and location of required concrete pads and bases.
   j. Valve stem movement.
   k. Structural floor, wall and roof opening sizes and details.
2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
4. Prepare reflected ceiling plans to coordinate and integrate installations, air distribution devices, light fixtures, communication systems components, and other ceiling-mounted items.

B. This Contractor shall be responsible for coordination of all items that will affect the installation of the work of this Division. This coordination shall include, but not be limited to: voltage, ampacity, capacity, electrical and piping connections, space requirements, sequence of construction, building requirements and special conditions.

C. By submitting coordination drawings on the project, this Contractor is indicating that all necessary coordination has been completed and that the systems, products and equipment submitted can be installed in the building and will operate as specified and intended, in full coordination with all other Contractors and Subcontractors.

1.15 RECORD DOCUMENTS

A. Prepare Record Documents in accordance with the requirements in Special Project Requirements, in addition to the requirements specified in Division 23, indicate the following installed conditions:

1. Duct mains and branches, size and location, for both exterior and interior; locations of dampers, fire dampers, duct access panels, and other control devices; filters, fuel fired heaters, fan coils, condensing units, and roof-top A/C units requiring periodic maintenance or repair.
2. Mains and branches of piping systems, with valves and control devices located and numbered, concealed unions located, and with items requiring maintenance located (i.e., traps, strainers, expansion compensators, tanks, etc.). Valve location diagrams, complete with valve tag chart. Indicate actual inverts and horizontal locations of underground piping.
3. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
4. Approved substitutions, Contract Modifications, and actual equipment and materials installed.
5. Contract Modifications, actual equipment and materials installed.

B. Engage the services of a Land Surveyor or Professional Engineer registered in the state in which the project is located as specified herein to record the locations and invert elevations of underground installations.

C. The Contractor shall maintain a set of clearly marked black line record "AS-BUILT" prints on the job site on which he shall mark all work details, alterations to meet site conditions and changes made by "Change Order" notices. These shall be kept available for inspection by the Owner, Architect or Engineer at all times.

D. Refer to Division 00 and Division 01 for additional requirements concerning Record Drawings. If the Contractor does not keep an accurate set of as-built drawings, the pay request may be altered or delayed at the request of the Architect. Mark the drawings with a colored pencil. Delivery of as-built prints and reproducibles is a condition of substantial completion.

E. The record prints shall be updated on a daily basis and shall indicate accurate dimensions for all buried or concealed work, precise locations of all concealed pipe or duct, locations of all concealed valves, controls and devices and any deviations from the work shown on the Construction Documents which are required for coordination. All dimensions shall include at least two dimensions to permanent structure points.

F. Submit three prints of the tracings for review. Make corrections to tracings as directed and deliver "Auto Positive Tracings" to the Architect. "As-Built" drawings shall be furnished in addition to submittals.

G. When the option described in paragraph F above is not exercised, then upon completion of the Work, the Contractor shall transfer all marks from the tracings and submit a set of clear concise reproducible record "AS-BUILT" drawings and shall submit the reproducible drawings with corrections made by a competent draftsman and three (3) sets of black line prints to the Architect or Engineer for review prior to scheduling the final

inspection at the completion of the Work. The reproducible record "AS-BUILT" drawings shall have the Engineer's Name and Seal removed or blanked out and shall be clearly marked and signed on each sheet as follows:

CERTIFIED RECORD DRAWINGS

DATE:

(NAME OF GENERAL CONTRACTOR)

BY:_____
(SIGNATURE)

(NAME OF SUBCONTRACTOR)

BY:_____
(SIGNATURE)

## 1.16 OPERATING AND MAINTENANCE MANUALS

A. Prepare operating and maintenance manuals in accordance with Division 00 and Division 01 and, in addition to the requirements specified in those Divisions, include the following information for equipment items:

1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
4. Servicing instructions and lubrication charts and schedules.

## 1.17 CERTIFICATIONS AND TEST REPORTS

A. Submit a detailed schedule for completion and testing of each system indicating scheduled dates for completion of system installation and outlining tests to be performed and scheduled date for each test. This detailed completion and test schedule shall be submitted at least 90 days before the projected substantial completion date.

B. Test result reporting forms shall be submitted for review no later than the date of the detailed schedule.

C. Submit 4 copies of all certifications and test reports to the Architect or Engineer for review adequately in advance of substantial completion of the Work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.

D. Certifications and test reports to be submitted shall include, but not be limited to, those items outlined in Section 23 02 00.

1.18 OPERATING AND MAINTENANCE MANUALS

A. Coordinate with Division 00 and Division 01 for operating and maintenance manual requirements. Unless noted otherwise, bind together in "D ring type" binders (National model no. 79-883 or equal). Binders shall be large enough to allow ¼" of spare capacity. Three (3) sets of all reviewed submittals, fabrication drawings, bulletins, maintenance instructions, operating instructions and parts exploded views and lists for each and every piece of equipment furnished under these Specifications. All sections shall be typed and indexed into sections and labeled for easy reference and shall utilize the individual specification section numbers shown in the Mechanical Specifications as an organization guideline. Bulletins containing information about equipment that is not installed on the project shall be properly marked up or stripped and reassembled. All pertinent information required by the Owner for proper operation and maintenance of equipment supplied by Division 23 shall be clearly and legibly set forth in memoranda that shall, likewise, be bound with bulletins.

B. Prepare maintenance manuals in accordance with Special Project Conditions. In addition to the requirements specified in Division 23, include the following information for equipment items:

1. Identifying names, name tag designations and locations for all equipment.
2. Valve tag lists with valve number, type, color coding, location and function.
3. Reviewed submittals with exceptions noted compliance letter.
4. Fabrication drawings.
5. Equipment and device bulletins and data sheets clearly highlighted to show equipment installed on the project and including performance curves and data as applicable (i.e., description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and model numbers of replacement parts).
6. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
7. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions, servicing instructions and lubrication charts and schedules.
8. Equipment and motor name plate data.
9. Wiring diagrams.
10. Exploded parts views and parts lists for all equipment and devices.
11. Color coding charts for all painted equipment and piping.
12. Location and listing of all spare parts and special keys and tools furnished to the Owner.
13. Furnish recommended lubrication schedule for all required lubrication points with listing of type and approximate amount of lubricant required.

C. Refer to Division 00 and Division 01 for additional information on Operating and

Maintenance Manuals.

D. Operating and Maintenance Manuals shall be turned over to the Owner or Engineer for review a minimum of 14 working days prior to the beginning of the operator training period.

1.19 OPERATOR TRAINING

A. The Contractor shall furnish the services of factory trained specialists to instruct the Owner's operating personnel. The Owner's operator training shall include a minimum of 12 hours of onsite training in three 4 hour shifts.

B. Before proceeding with the instruction of Owner Personnel, prepare a typed outline in triplicate, listing the subjects that will be covered in this instruction, and submit the outline for review by the Owner. At the conclusion of the instruction period, obtain the signature of each person being instructed on each copy of the reviewed outline to signify that he has a proper understanding of the operation and maintenance of the systems and resubmit the signed outlines.

C. Refer to other Division 23 Sections for additional Operator Training requirements.

1.20 FINAL COMPLETION

A. At the completion of the Work, all equipment and systems shall be tested and faulty equipment and material shall be repaired or replaced. Refer to Sections of Division 23 for additional requirements.

B. Clean and adjust all air distribution devices and replace all air filters immediately prior to Substantial Completion.

C. Touch up and/or refinish all scratched equipment and devices immediately prior to Substantial Completion.

1.21 CONTRACTOR'S GUARANTEE

A. Use of the HVAC systems to provide temporary service during construction period will not be allowed without permission from the Owner in writing; and, if granted, shall not cause the warranty period to start, except as defined below.

B. Contractor shall guarantee to keep the entire installation in repair and perfect working order for a period of one year after the date of the Substantial Completion, and shall furnish (free of additional cost to the Owner) all materials and labor necessary to comply with the above guarantee throughout the year beginning from the date of Substantial Completion, Beneficial Occupancy by the Owner, or the Certificate of Final Payment as agreed upon by all parties.

C. This guarantee shall not include cleaning or changing filters except as required by testing, adjusting and balancing.

D. All air conditioning compressors shall have parts and labor guarantees for a period of not

less than 5 years beyond the date of Substantial Completion.

E. Refer to Sections in Division 23 for additional guarantee or warranty requirements.

1.22 TRANSFER OF ELECTRONIC FILES

A. Project documents are not intended or represented to be suitable for reuse by Architect/Owner or others on extensions of this project or on any other project. Any such reuse or modification without written verification or adaptation by Engineer, as appropriate for the specific purpose intended, will be at Architect/Owner's risk and without liability or legal exposure to Engineer or its consultants from all claims, damages, losses and expense, including attorney's fees arising out of or resulting thereof.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently, or otherwise, without authorization of the data's creator, the party receiving the electronic files agrees that it will perform acceptance tests or procedures within sixty (60) days of receipt, after which time the receiving party shall be deemed to have accepted the data thus transferred to be acceptable. Any errors detected within the sixty (60) day acceptance period will be corrected by the party delivering the electronic files. Engineer is not responsible for maintaining documents stored in electronic media format after acceptance by the Architect/Owner.

C. When transferring documents in electronic media format, Engineer makes no representations as to the long term compatibility, usability or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by Engineer at the beginning of the Project.

D. Any reuse or modifications will be at the Contractor's sole risk and without liability or legal exposure to Architect, Engineer or any consultant.

E. The Texas Board of Architectural Examiners (TBAE) has stated that it is in violation of Texas law for persons other than the Architect of record to revise the Architectural drawings without the Architect's written consent.

It is agreed that "MEP" hard copy or computer-generated documents will not be issued to any other party except directly to the Architect/Owner. The Contract Documents are contractually copyrighted and cannot be used for any other project or purpose except as specifically indicated in AIA B-141 Standard Form of Agreement Between Architect and Owner.

If the client, Architect/Owner, or developer of the project requires electronic media for "record purposes", then an AutoCAD based compact disc ("CD") will be prepared. The "CD" will be submitted with all title block references intact and will be formatted in a "plot" format to permit the end user to only view and plot the drawings. Revisions will not be permitted in this configuration.

F. At the Architect/Owner's request, Engineer will prepare one "CD" of electronic media to assist the Contractor in the preparation of submittals. The Engineer will prepare and submit the "CD" to the Architect/Owner for distribution to the Contractor.

The "CD" will be prepared and all title blocks, names and dates will be removed. The

"CD" will be prepared in a ".dwg" format to permit the end user to revise the drawings.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Provide materials and equipment manufactured by a domestic United States manufacturer and assembled in the United States for all local and Federal Government projects. These materials and equipment shall comply with "Buy American Act."

B. Access Doors: Provide access doors as required for access to equipment, valves, controls, cleanouts and other apparatus where concealed. Access doors shall have concealed hinges and screw driver cam locks.

C. All access doors located in wet areas such as restrooms, locker rooms, shower rooms, kitchen and any other wet areas shall be constructed of stainless steel.

D. Access Doors: shall be as follows:

1. Plastic Surfaces: Milcor Style K.
2. Ceramic Tile Surface: Milcor Style M.
3. Drywall Surfaces: Milcor Style DW.
4. Install doors only in locations approved by the Architect.

2.2 EQUIPMENT PADS (See 2.04 in Section 26 02 00)

PART 3 - EXECUTION

3.1 ROUGH-IN

A. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected via reviewed submittals.

B. Refer to equipment specifications in Divisions 2 through 48 for additional rough-in requirements.

3.2 MECHANICAL INSTALLATIONS

A. General: Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:

1. Coordinate mechanical systems, equipment, and materials installation with other building components.
2. Verify all dimensions by field measurements.
3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.
4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
5. Sequence, coordinate, and integrate installations of mechanical materials and

equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.

6. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
7. Coordinate connection of mechanical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service.
8. Install systems, materials, and equipment to conform with architectural action markings on submittal, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, resolve conflicts and submit proposed solution to the Architect for review.
9. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
10. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as possible, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location and label.
11. Install access doors where units are concealed behind finished surfaces. Refer to paragraph 2.01 in this section and architect for access doors specifications and location.
12. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.
13. Provide roof curbs for all roof mounted equipment. Coordinate with roof construction for pitched roof. Provide roof curbs which match the roof slope and provides a level top for equipment installation. Refer to Architectural drawings and details.
14. The equipment to be furnished under these Specifications shall be essentially the standard product of the manufacturer. Where two or more units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the system need not be the product of the same manufacturer.
15. The Architectural and Structural features of the building and the space limitations shall be considered in selection of all equipment. No equipment shall be furnished which will not suit the arrangement and space limitations indicated.
16. Lubrication: Prior to start-up, check and properly lubricate all bearings as recommended by the manufacturer.
17. Where the word "Concealed" is used in these Specifications in connection with insulating, painting, piping, ducts, etc., it shall be understood to mean hidden from sight as in chases, furred spaces or suspended ceilings. "Exposed" shall be understood to mean the opposite of concealed.
18. Identification of Mechanical Equipment:
    a. Mechanical equipment shall be identified by means of nameplates permanently attached to the equipment. Nameplates shall be engraved laminated plastic or etched metal. Submittals shall include dimensions and lettering format for approval. Attachment shall be with escutcheon pins, self-tapping screws, or machine screws.

b. Tags shall be attached to all valves, including control valves, with nonferrous chain. Tags shall be brass and at least 1-1/2 inches in diameter. Nameplate and tag symbols shall correspond to the identification symbols on the temperature control submittal and the "as-built" drawings.

19. Provide construction filters for all air handling units, fain coil unit, UAV boxes, and all other air handling equipment during the entire construction period.

3.3 CUTTING AND PATCHING

A. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.

B. Perform cutting, fitting, and patching of mechanical equipment and materials required to:

1. Uncover Work to provide for installation of ill-timed Work.
2. Remove and replace defective Work.
3. Remove and replace Work not conforming to requirements of the Contract Documents.
4. Remove samples of installed Work as specified for testing.
5. Install equipment and materials in existing structures.
6. Upon written instructions from the Engineer, uncover and restore Work to provide for Engineer/Owner's observation of concealed Work, without additional cost to the Owner.
7. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers. Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers; refer to the materials and methods required for the surface and building components being patched; Refer to Paragraph 1.11 I for definition of "Installer."

C. Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated, including but not limited to removal of mechanical piping, mechanical ducts and HVAC units, and other mechanical items made obsolete by the new Work.

D. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.

E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

3.4 WORK SEQUENCE, TIMING, COORDINATION WITH OWNER, ARCHITECT AND ENGINEER

A. The Owner will cooperate with the Contractor, however, the following provisions must be observed:

1. A meeting will be held at the project site, prior to any construction, between the Owner's Representative, the General Contractor, the Sub-Contractors and the

Engineer to discuss Contractor's employee parking space, access, storage of equipment or materials, and use of the Owner's facilities or utilities. The Owner's decisions regarding such matters shall be final.

2. During the construction of this project, normal facility activities will continue in existing buildings until renovated areas are completed. Plumbing, fire protection, lighting, electrical, communications, heating, air conditioning, and ventilation systems shall be maintained in service within the occupied spaces of the existing building.
3. Contractor shall not start-up any of the HVAC equipment unless the Owner, Architect and Engineer are signed off.
4. Start-up for major HVAC equipment such as chillers, cooling towers, variable frequency drives and hot water boilers shall be performed by a factory technician. The start-up shall include a written report signed off by Contractor, Engineer and Owner.

## 3.5 DEMOLITION AND WORK WITHIN EXISTING BUILDINGS

A. In the preparation of these documents every effort has been made to show the approximate locations of, and connections to, the existing piping, duct, equipment and other apparatus related to this phase of the Work. However, this Contractor shall be responsible for verifying all of the above information. This Contractor shall visit the existing site to inspect the facilities and related areas. This Contractor shall inspect and verify all details and requirements of all the Contract Documents, prior to the submission of a proposal. All discrepancies between the Contract Documents and actual job-site conditions shall be resolved by the contractor, who shall produce drawings that shall be submitted to the Architect/Engineer for review. All labor and materials required to perform the work described shall be a part of this Contract.

B. All equipment and/or systems noted on the Drawings "To Remain" shall be inspected and tested on site to certify its working condition. A written report on the condition of all equipment to remain, including a copy of the test results and recommended remedial actions and costs shall be made by this Contractor to the Architect/Engineer for review.

C. All equipment and/or systems noted on the Drawings "To Be Removed" shall be removed including, associated pipe and duct, pipe and duct hangers and/or line supports. Where duct or pipe is to be capped for future or end of line use, it shall be properly tagged with its function or service appropriately identified. Where existing equipment is to be removed or relocated and has an electric motor or connection, the Electrical Contractor shall disconnect motor or connection, remove wiring to a safe point and this Contractor shall remove or relocate motor or connection along with the equipment.

D. During construction and remodeling, portions of the Project shall remain in service. Construction equipment, material, tools, extension cords, etc., shall be arranged so as to present minimum hazard or interruption to the occupants of the building. None of the construction work shall interfere with the proper operation of the existing facility; or be so conducted as to cause harm or danger to persons on the premises. All fire exits, stairs or corridors required for proper access, circulation or exit shall remain clear of equipment, materials or debris. The General Contractor shall maintain barricades, other separations in corridors and other spaces where work is conducted.

E. Certain work during the demolition and construction phases may require overtime or night time shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time with the Owner at least seventy-two (72) hours in advance in writing.

F. Any salvageable equipment as determined by the Owner, shall be delivered to the Owner, and placed in storage at the location of his choice. All other debris shall be removed from the site immediately.

G. Equipment, piping or other potential hazards to the occupants of the building shall not be left overnight outside of the designated working or construction area.

H. Make every effort to minimize damage to the existing building and the Owner's property. Repair, patch or replace as required any damage that occurs as a result of work at the site. Care shall be taken to minimize interference with the Owner's activities during construction and to keep construction disrupted areas to a minimum. Coordinate with the Owner and other trades in scheduling and performance of the work.

I. Include in the contract price all rerouting of existing pipe, duct, etc., and the reconnecting of the existing equipment as necessitated by field conditions to allow the installation of the new systems regardless of whether or not such rerouting, reconnecting or relocating is shown on the Drawings. Furnish all temporary pipe, duct, controls, etc., as required to maintain heating, cooling, and ventilation services for the existing areas with a minimum of interruption.

J. All existing pipe, duct, materials, equipment, controls and appurtenances not included in the remodel or alteration areas are to remain in place.

K. Pipe, duct, equipment and controls serving mechanical and other Owner's equipment, etc., which is to remain but is served by pipe, duct, equipment and controls that are disturbed by the remodeling work, shall be reconnected in such a manner as to leave this equipment in proper operating condition.

L. No portion of the fire protection systems shall be turned off, modified or changed in any way without the express knowledge and written permission of the Owner’s representative in order to protect systems that shall remain in service.

M. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and operating system in cooperation with other trades with a minimum of disruption or downtime.

N. Refer to Architectural Demolition and/or Alteration plans for actual location of walls, ceilings, etc., being removed and/or remodeled.

**END OF SECTION**

# SECTION 23 03 00 - MECHANICAL DEMOLITION FOR REMODELING

## PART 1 - GENERAL

### 1.1 SECTION INCLUDES

A. Mechanical demolition.

B. The Drawings do not show all demolition work required. The Contractor shall make himself familiar with the required scope of work to accomplish the work required by these documents. All demolition work implied or required shall be included in the scope of this contract.

C. Utility service outages required by the new installation will be permitted but only at a time approved by the Owner. The Contractor shall allow the Owner 2 weeks in order to schedule required outages. The time allowed for outages will not be during normal working hours unless otherwise approved by the Owner. All costs of outages, including overtime charges, shall be included in the contract amount.

### 1.2 RELATED SECTIONS

A. Section 02 40 00 - Demolition and Structure Moving.

### 1.3 WORK SEQUENCE, TIMING, COORDINATION WITH OWNER

A. The Owner will cooperate with the Contractor; however, the following provisions must be observed:

1. During the construction of this project, normal facility activities will continue in existing buildings until new buildings or renovated areas are completed. Plumbing, fire protection, lighting, electrical, communications, heating, air conditioning, and ventilation systems shall be maintained in service within the occupied spaces of the existing building.
2. A meeting will be held at the project site, prior to any construction, between the Owner's Representative, the General Contractor, the Subcontractors and Sub-subcontractors, and the Engineer to discuss Contractor's employee parking space, access, storage of equipment or materials, and use of the Owner's facilities or utilities. The Owner's decisions regarding such matters shall be final.

### 1.4 DEMOLITION AND WORK WITHIN EXISTING BUILDINGS

A. In the preparation of these documents every effort has been made to show the approximate locations of, and connections to the existing piping, duct, equipment and other apparatus related to this phase of the Work. However, this Contractor shall be responsible for verifying all of the above information. This Contractor shall visit the existing site to inspect the facilities and related areas. This Contractor shall inspect and verify all details and requirements of all the Contract Documents, prior to the submission of a proposal. All discrepancies between the Contract Documents and actual job-site conditions shall be resolved by the contractor, who shall produce drawings which shall be

submitted to the Architect/Engineer for review. All labor and materials required to perform the work described shall be a part of this Contract.

B. All equipment and/or systems noted on the Drawings "To Remain" shall be inspected and tested on site to certify its working condition. A written report on the condition of all equipment to remain, including a copy of the test results and recommended remedial actions and costs shall be made by this Contractor to the Architect/Engineer for review.

C. All equipment and/or systems noted on the Drawings "To Be Removed" should be removed including, associated pipe and duct, pipe and duct hangers and/or line supports. Where duct or pipe is to be capped for future or end of line use, it shall be properly tagged with its function or service appropriately identified. Where existing equipment is to be removed or relocated and has an electric motor or connection, the Electrical Contractor shall disconnect motor or connection, remove wiring to a safe point and this Contractor shall remove or relocate motor or connection along with the equipment.

D. During construction and remodeling, portions of the Project shall remain in service. Construction equipment, material, tools, extension cords, etc., shall be arranged so as to present minimum hazard or interruption to the occupants of the building. None of the construction work shall interfere with the proper operation of the existing facility; or be so conducted as to cause harm or danger to persons on the premises. All fire exits, stairs or corridors required for proper access, circulation or exit shall remain clear of equipment, materials or debris. The General Contractor shall maintain barricades, other separations in corridors and other spaces where work is conducted.

E. Certain work during the demolition and construction phases may require overtime or night time shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time with the Owner at least seventy-two (72) hours in advance in writing.

F. Any salvageable equipment as determined by the Owner, shall be delivered to the Owner, and placed in storage at the location of his choice. All other debris shall be removed from the site immediately.

G. Equipment, piping or other potential hazards to the occupants of the building shall not be left overnight outside of the designated working or construction area.

H. Make every effort to minimize damage to the existing building and the Owner's property. Repair, patch or replace as required any damage which occurs as a result of work at the site. Care shall be taken to minimize interference with the Owner's activities during construction and to keep construction disrupted areas to a minimum. Coordinate with the Owner and other trades in scheduling and performance of the work.

I. Include in the contract price all rerouting of existing pipe, duct, etc., and the reconnecting of the existing equipment as necessitated by field conditions to allow the installation of the new systems regardless of whether or not such rerouting, reconnecting or relocating is shown on the drawings. Furnish all temporary pipe, duct, controls, etc., as required to maintain heating, cooling, and ventilation services for the existing areas with a minimum of interruption.

J. All existing pipe, duct, materials, equipment, controls and appurtenances not included in the remodel or alteration areas are to remain in place.

K. Pipe, duct, equipment and controls serving mechanical and other Owner's equipment, etc., which is to remain but which is served by pipe, duct, equipment and controls that are disturbed by the remodeling work, shall be reconnected in such a manner as to leave this equipment in proper operating condition.

L. No portion of the fire protection systems shall be turned off, modified or changed in any way without the express knowledge and written permission of the Owner's representative in order to protect systems that shall remain in service.

M. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and operating system in cooperation with other trades with a minimum of disruption or downtime.

N. Refer to Architectural Demolition and/or Alteration plans for actual location of walls, ceilings, etc., being removed and/or remodeled.

## PART 2 - PRODUCTS

### 2.1 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual Sections.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

A. Field verify measurements, and piping arrangements shown on Drawings.

B. Verify that abandoned piping and equipment serve only abandoned facilities.

C. Demolition Drawings are based on casual field observation and existing Record Documents. Report discrepancies to Architect and Engineer before disturbing existing installation.

D. Beginning of demolition means that the contractor accepts existing conditions.

### 3.2 PREPARATION

A. Disconnect mechanical systems in walls, floors, and ceilings scheduled for removal.

B. Coordinate utility service outages with Utility Company.

C. Provide temporary connections, if required, to maintain existing systems in service during construction. When work must be performed on energized equipment, use

personnel experienced in such operations.

D. Existing Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from Owner at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

E. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Notify Owner and local fire service at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

3.3 DEMOLITION AND EXTENSION OF EXISTING MECHANICAL WORK

A. Demolish and extend existing mechanical work under provisions of Division 02 and this Section.

B. Remove, relocate, and extend existing systems to accommodate new construction.

C. Remove abandoned piping to source of supply.

D. Remove exposed abandoned piping systems, including abandoned systems above accessible ceiling finishes. Cut systems flush with walls and floors, and patch surfaces.

E. Repair adjacent construction and finishes damaged during demolition and extension work.

F. Maintain access to existing systems which remain active. Modify installation or provide access doors as appropriate.

G. Extend existing systems using materials and methods compatible with existing systems, or as specified.

3.4 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment which remain or are to be reused.

3.5 INSTALLATION

A. Install relocated materials and equipment under the provisions of Division 02.

3.6 REMOVAL OF MATERIALS

A. The Contractor shall modify, remove, and/or relocate all materials and items so indicated on the Drawings or required by the installation of new facilities. All removals and/or dismantling shall be conducted in a manner as to produce maximum salvage. Salvage materials shall remain the property of the Owner, and shall be delivered to such

destination as directed by the Owner. Materials and/or items scheduled for relocation and which are damaged during dismantling or reassembly operations shall be repaired and restored to good operating condition. The Contractor may, at his discretion and upon the approval of the Owner, substitute new materials and/or items of like design and quality in lieu of materials and/or items to be relocated.

B. All items which are to be relocated shall be carefully removed in reverse to original assembly or placement and protected until relocated. The contractor shall clean and repair and provide all new materials, fittings, and appurtenances required to complete the relocations and to restore to good operative order. All relocations shall be performed by workmen skilled in the work and in accordance with standard practice of the trades involved.

C. When items scheduled for relocation are found to be in damaged condition before work has been started on dismantling, the Contractor shall call the attention of the Owner to such items and receive further instructions before removal. Items damaged in repositioning operations are the Contractor's responsibility and shall be repaired or replaced by the Contractor as approved by the Owner, at no additional cost to the Owner.

D. Service lines and wiring to items to be removed, salvaged, or relocated shall be removed to points indicated on the Drawings, specified, or acceptable to the Owner. Service lines and wiring not scheduled for reuse shall be removed to the points at which reuse is to be continued or service is to remain. Such services shall be sealed, capped, or otherwise tied-off or disconnected in a safe manner acceptable to the Owner. All disconnections or connections into the existing facilities shall be done in such a manner as to result in minimum interruption of services to adjacent occupied areas. Services to existing areas or facilities which must remain in operation during the construction period shall not be interrupted without prior specific approval of the Owner as hereinbefore specified.

E. Certain work during the demolition and construction phases may require overtime or nighttime shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time with the Owner's Representative at least 72 hours in advance in writing.

F. Make every effort to minimize damage to the existing building and the Owner's property. Repair, patch, or replace as required any damage which occurs as a result of work at the site. Care shall be taken to minimize interference with the Owner's activities during construction. Cooperate with the Owner and other trades in scheduling and performance of the work.

G. Include in the contract price all rerouting of existing pipe, duct, etc., and the reconnecting of the existing equipment as necessitated by field conditions to allow the installation of the new systems regardless of whether or not such rerouting, reconnecting or relocating is shown on the Drawings. Furnish all temporary pipe, duct, controls, etc., as required to maintain heating, cooling, and ventilation services for the existing areas with a minimum of interruption.

H. The Contractor shall be responsible for loss or damage to the existing facilities caused by

him and his workmen, and shall be responsible for repairing such loss or damage. The Contractor shall send proper notices, make necessary arrangements, and perform other services required for the care, protection and in-service maintenance of all electrical services for the new and existing facilities. The Contractor shall erect temporary barricades, with necessary safety devices, as required to protect personnel from injury, removing all such temporary protection upon completion of the work.

I. Where existing construction is removed to provide working and extension access to existing utilities, Contractor shall remove doors, piping, conduit, outlet boxes, wiring, light fixtures, air conditioning ductwork and equipment, etc., to provide this access and shall reinstall same upon completion of work in the areas affected.

J. Where partitions, walls, floors, or ceilings of existing construction are being removed, all contractors shall remove and reinstall in locations approved by the Architect all devices required for the operation of the various systems installed in the existing construction.

END OF SECTION

# SECTION 23 05 13 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

## PART 1 - GENERAL

### 1.1 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. The Basic Materials and Methods, Section 23 02 00, are included as a part of this Section as though written in full in this document.

### 1.2 SCOPE

A. Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.

B. WORK SPECIFIED ELSEWHERE:

1. Painting
2. Automatic temperature controls.
3. Power control wiring to motors and equipment.

### 1.3 WARRANTY

Warrant the Work specified herein for one year and motors for five years beginning on the date of substantial completion against becoming unserviceable or causing an objectionable appearance resulting from either defective or nonconforming materials and workmanship.

### 1.4 SUBMITTALS

A. SHOP DRAWINGS: Indicate size material, and finish. Show locations and installation procedures. Include details of joints, attachments, and clearances.

B. PRODUCT DATA: Submit schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures variations, and accessories.

C. MOTOR NAMEPLATE INFORMATION: Manufacturer's name, address, utility and operating data.

D. Refer to Division One for additional information.

### 1.5 DELIVERY AND STORAGE

A. DELIVERY: Deliver clearly labeled, undamaged materials in the manufacturers' unopened containers.

B. TIME AND COORDINATION: Deliver materials to allow for minimum storage time at the project site. Coordinate delivery with the scheduled time of installation.

C. STORAGE: Store materials in a clean, dry location, protected from weather and abuse.

PART 2 - PRODUCTS

2.1 ELECTRIC MOTORS

A. APPROVED MANUFACTURERS: Provide motors by a single manufacturer as much as possible.

1. Centruy/Gould/Reliance
2. Culter-Hammer
3. General Electric
4. Magnatek
5. Toshiba

B. TEMPERATURE RATING: Provide insulation as follows:

1. CLASS B: 40 degrees C maximum.
2. CLASS F:
   a. Between 40 degrees C and 65 degrees C maximum.
   b. Totally enclosed motors.

C. STARTING CAPABILITY: As required for service indicated five starts minimum per hour.

D. PHASES AND CURRENT: Verify electrical service compatibility with motors to be used.

1. UP TO 1/2 HP: Provide permanent split, capacitor-start single phase with inherent overload protection.
2. 3/4 HP AND LARGER: Provide squirrel-cage induction polyphone.
3. Provide two separate windings on 2-speed polyphone motors.
4. Name plate voltage shall be the same as the circuit's normal voltage, serving the motor.

E. SERVICE FACTOR: 1.15 for polyphase; 1.35 for single phase.

F. FRAMES: U-frames 1.5 hp. and larger.

G. BEARINGS: Provide sealed re-greasable ball bearings; with top mounted zerk lubrication fittings and bottom side drains minimum average life 100,000 hours typically, and others as follows:

1. Design for thrust where applicable.
2. PERMANENTLY SEALED: Where not accessible for greasing.
3. SLEEVE-TYPE WITH OIL CUPS: Light duty fractional hp. motors or polyphase requiring minimum noise level.

H. ENCLOSURE TYPE: Provide enclosures as follows:

1. CONCEALED INDOOR: Open drip proof.

2. EXPOSED INDOOR: Guarded.
3. OUTDOOR TYPICAL: Type II. TEC.
4. OUTDOOR WEATHER PROTECTED: Type I. TEA.

I. OVERLOAD PROTECTION: Built-in sensing device for stopping motor in all phase legs and signaling where indicated for fractional horse power motors.

J. NOISE RATING: "Quiet" except where otherwise indicated.

K. EFFICIENCY: Minimum full load efficiency listed in the following table, when tested in accordance with IEEE Test Procedure 112A, Method B, including stray load loss measure.

| Motor Horsepower | NEMA Efficiency INDEX Letter | Minimum Efficiency % |
|---|---|---|
| | 1800 RPM Synchronous Speed | |
| 7.5-10 | F | 89.5 |
| 15-20 | E | 91.0 |
| 25-30 | E | 92.4 |
| 40 | D | 93.0 |
| 50 | C | 93.0 |
| 60 | C | 93.6 |
| 75 | C | 94.1 |
| 100-125 | B | 94.5 |
| 150-200 | B | 95.0 |
| | 1200 RPM Synchronous Speed | |
| 3-5 | G | 87.5 |
| 7.5 | G | 89.5 |
| 10 | F | 89.5 |
| 15 | F | 90.2 |
| 20 | E | 90.2 |
| 25-30 | E | 91.7 |
| 40-50 | D | 93.0 |
| 60 | D | 93.6 |
| 75 | C | 93.6 |
| 100-125 | C | 94.1 |
| 150-200 | B | 95.0 |

2.2 MOTOR CONTROLLERS (STARTERS)

A. All motor controllers (for equipment furnished under Division 23) shall be furnished under Division 23 and installed under Division 26 unless otherwise noted on the plans.

1. Starters shall be provided for 3 phase motors 1/2 horsepower and greater.

B. Motor starters shall be furnished as follows.

1. GENERAL: Motor starters shall be Square D Company Class 8536 across-the-

line magnetic type, full-voltage, non-reversing (FAVOR) starter. All starters shall be constructed and tested in accordance with the latest NEMA standards, sizes and horsepower. ICE sizes are not acceptable. Starters shall be mounted in a general purpose dead front, painted steel enclosure and surface-mounted. Provide size and number of poles as shown and required by equipment served. Provide two speed, two winding or two speed, single winding motor starter as required for two speed motors.

2. CONTACTS: Magnetic starter contacts shall be double break solid silver alloy. All contacts shall be replaceable without removing power wiring or removing starter from panel. The starter shall have straight-through wiring.
3. OPERATING COILS: Operating coils shall be 120 volts and shall be of molded construction. When the coil fails, the starter shall open and shall not lock in the closed position.
4. OVERLOAD RELAYS: Provide manual reset, trip-free Class 20 overload relays in each phase conductor in of all starters. Overload relays shall be melting alloy type with visual trip indication. All 3 phase and single phase starters shall have one overload relay in each underground conductor. Relay shall not be field adjustable from manual to automatic reset. Provide 6 overload relays for two speed motor starters.
5. PILOT LIGHTS: Provide a red running pilot light for all motor starters. Pilot lights shall be mounted in the starter enclosure cover. Pilot lights shall be operated from an interlock on the motor starter and shall not be wired across the operating coil.
6. CONTROLS: Provide starters with HAND-OFF-AUTOMATIC switches. Coordinate additional motor starter controls with the requirements of Division 23. Motor starter controls shall be mounted in the starter enclosure cover.
7. CONTROL POWER TRANSFORMER: Provide a single-phase 480 volt control power transformer with each starter for 120 volt control power. Connect the primary side to the line side of the motor starter. The primary side shall be protected by a fuse for each conductor. The secondary side shall have one leg fused and one leg grounded. Arrange transformer terminals so that wiring to terminals will not be located above the transformer.
8. AUXILIARY CONTACTS: Each starter shall have one normally open and one normally closed convertible auxiliary contact in addition to the number of contacts required for the "holding interlock", remote monitoring, and control wiring. In addition, it shall be possible to field-install three more additional auxiliary contacts without removing existing wiring or removing the starter from its enclosure.
9. UNIT WIRING: Unit shall be completely pre-wired to terminals to eliminate any interior field wiring except for line and load power wiring and HVAC control wiring.
10. ENCLOSURES: All motor starter enclosures shall be NEMA 1, general purpose enclosures or NEMA-3R if mounted exposed to high moisture conditions. Provide NEMA 4X when located by cooling towers.
11. POWER MONITOR: Provide a square "D" 8430 MPS phase failure and under-voltage relay, base and wiring required for starters serving all 3 phase motors. Set the under-voltage setting according to minimum voltage required for the motor to operate within its range.

C. APPROVED MANUFACTURERS: Controller numbers are based on first named

manufacturer. Provide one of the following manufacturer's.

1. Siemens.
2. Square D.
3. General Electric.
4. Eaton.

2.3 COMBINATION MOTOR STARTERS

A. GENERAL: Combination motor starters shall consist of a magnetic starter and a fusible or non-fusible disconnect switch in a dead front, painted steel NEMA 1 enclosure unless otherwise noted and shall be surface-mounted. Size and number of poles shall as shown and required by equipment served. Combination motor starters shall be as specified for motor starters in Paragraph 2.01/B, except as modified herein.

B. DISCONNECT SWITCH: Disconnect switches shall be as specified in Section 26 28 16.

C. APPROVED MANUFACTURERS: Controller numbers are based on first named manufacturer. Provide one of the following manufacturer's.

1. Siemens.
2. Square D.
3. General Electric.

PART 3 - EXECUTION

3.1 All equipment shall be installed in accordance with the manufacturers' recommendations and printed installation instructions.

3.2 All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Contractors' price shall include all items required as per manufacturers' requirements.

3.3 INSTALLATION

A. GENERAL: Install in a professional manner. Any part or parts not meeting this requirement shall be replaced or rebuilt without extra expense to Owner.

B. Install rotating equipment in static and dynamic balance.

C. Provide foundations, supports, and isolators properly adjusted to allow minimum vibration transmission within the building.

D. Correct objectionable noise or vibration transmission in order to operate equipment satisfactorily as determined by the Engineer.

**END OF SECTION**

# SECTION 23 05 48 – VIBRATION AND SEISMIC CONTROLS FOR HVAC PIPING AND EQUIPMENT

## PART 1 - GENERAL

### 1.1 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. This Section and Section 23 02 00 – Basic Materials and Methods are part of each Division 23 Section which references the vibration control products specified herein.

### 1.2 WORK INCLUDED

A. Vibration and sound control products.

### 1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of vibration control products of type, size, and capacity required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Vibration and sound control products shall conform to ASHRAE criteria for average noise criteria curves for all equipment at full load conditions.

C. Unless otherwise indicated, sound and vibration control products shall be provided by a single manufacturer.

### 1.4 SUBMITTALS

A. SHOP DRAWINGS: Indicate size, material, and finish. Show locations and installation procedures. Include details of joints, attachments, and clearances.

B. PRODUCT DATA: Submit schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, product variations, and accessories.

## PART 2 - PRODUCTS

### 2.1 ACCEPTABLE MANUFACTURERS

A. Amber/Booth Company, Inc.

B. Mason Industries, Inc.

C. Noise Control, Inc.

D. Korfund Dynamics

E. Vibration Mountings & Controls

2.2 GENERAL

A. Provide vibration isolation supports for equipment, piping and ductwork, to prevent transmission of vibration and noise to the building structure that may cause discomfort to the occupants.

B. Model numbers of Amber/Booth products are included for identification. Products of the additional manufacturers will be acceptable provided they comply with all of the requirements of this specification.

2.4 CORROSION PROTECTION

A. All vibration isolators shall be designed and treated for resistance to corrosion.

B. Steel components: PVC coated or phosphated and painted with industrial grade enamel. Nuts, bolts, and washers: zinc-electroplated.

PART 3 - EXECUTION

3.1 All equipment shall be installed in accordance with the manufacturer's recommendations and printed installation instructions.

3.2 All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items required as per manufacturer's requirements.

3.3 If internal isolation option is used on air handling units, the mechanical contractor shall verify proper adjustment and operation of isolators prior to start-up. All shipping brackets and temporary restraint devices shall be removed.

3.4 The vibration isolation supplier shall certify in writing that he has inspected the installation and that all external isolation materials and devices are installed correctly and functioning properly.

**END OF SECTION**

# SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING

## PART 1 - GENERAL

### 1.1 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. Section 23 02 00 – Basic Materials and Methods is included as a part of this Section as though written in full in this document.

### 1.2 RELATED DOCUMENTS

Approved submittal date on equipment installed, to accomplish the test procedures, outlined under paragraph 3.01 of this Section, will be provided by the Contractor.

### 1.3 DESCRIPTION

A. The TAB of the air conditioning systems shall be performed by an impartial technical firm hired by Owner whose operations are limited only to the field of professional TAB. The TAB work will be done under the direct supervision of a qualified engineer employed by the TAB firm.

B. The TAB firm will be responsible for inspecting, adjusting, balancing, and logging the date on the performance of fans, dampers in the duct system, and air distribution devices. The Contractor and the various Subcontractors of the equipment installed shall cooperate with the TAB firm to furnish necessary data on the design and proper applications of the system components and provide labor and material required to eliminate deficiencies or malperformance.

### 1.4 QUALITY ASSURANCE

A. QUALIFICATIONS OF CONTRACTOR PERSONNEL: Submit evidence to show that the personnel who shall be in charge of correcting deficiencies for balancing the systems are qualified. The Owner and Engineer reserve the right to require that the originally approved personnel be replaced with other qualified personnel if, in the Owner and Engineer's opinion, the original personnel are not qualified to properly place the system in condition for balancing.

B. QUALIFICATIONS OF TAB FIRM PERSONNEL:

1. A minimum of one registered Professional Engineer licensed in the State, is required to be in permanent employment of the firm.
2. Personnel used on the jobsite shall be either Professional Engineers or technicians, who shall have been permanent, full time employees of the firm for a minimum of six months prior to the start of Work for that specified project.
3. Evidence shall be submitted to show that the personnel who actually balance the systems are qualified. Evidence showing that the personnel have passed the tests required by the Associated Air Balance Council (AABC) shall be required.

C. CALIBRATION LIST: Submit to the Engineer for approval, a list of the gauges, thermometers, velometer, and other balancing devices to be used in balancing the system. Submit evidence to show that the balancing devices are properly calibrated before proceeding with system balancing.

1.5 OPERATIONS PERSONNEL TRAINING

A. Provide a training session for the owner's operations personnel. Training session shall be performed by a qualified person who is knowledgeable in the subject system/equipment. Submit a training agenda two (2) weeks prior to the proposed training session for review and approval. Training session shall include at the minimum:

1. Purpose of equipment.
2. Principle of how the equipment works.
3. Important parts and assemblies.
4. How the equipment achieves its purpose and necessary operating conditions.
5. Most likely failure modes, causes and corrections.
6. On site demonstration.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 SERVICES OF THE CONTRACTOR

A. The Drawings and Specifications have indicated valves, dampers, and miscellaneous adjustment devices for the purpose of adjustment to obtain optimum operating conditions. Install these devices in a manner that leaves them accessible, and provide access as requested by the TAB firm.

B. Have systems complete and in operational readiness prior to notifying the TAB firm that the project is ready for their services, and certify in writing to the Architect and Owner that such a condition exists.

C. As a part of the Work of this Section, make changes in the sheaves, belts, and dampers or the addition of dampers required for correct balance of the new work as required by the TAB firm, at no additional cost to the Owner.

D. Fully examine the existing system to be balanced, to determine whether or not sufficient volume dampers, balancing valves, thermometers, gauges, pressure and temperature taps, means of reading static pressure and total pressure in duct systems, means of determining water flow, and other means of taking data needed for proper water and air balancing are existing. Submit to the Engineer in writing a listing of omitted items considered necessary to balance existing systems. Submit the list and proposal as a cost add item.

E. Verify that fresh air louvers are free of blockage, coils are clean and fresh air ducts to each air handling unit have individually adjustable volume regulating dampers.

F. Provide, correct, repair, or replace deficient items or conditions found during the testing, adjusting, and balancing period.

G. In order that systems may be properly tested, balanced, and adjusted as specified, operate the systems at no expense to the Owner for the length of time necessary to properly verify their completion and readiness for TAB period.

H. Project construction schedules shall provide time to permit the successful completion of TAB services prior to Substantial Completion. Complete, operational readiness, prior to commencement of TAB services, shall include the following services of the Contractor:

1. Construction status of building shall permit the closing of doors, windows, ceilings installed and penetrations complete, to obtain project operating conditions.
2. AIR DISTRIBUTION SYSTEMS:
    a. Verify installation for conformity to design. Supply, return, and exhaust ducts terminated and pressure tested for leakage as specified.
    b. Volume and fire dampers properly located and functional. Dampers serving requirements of minimum and maximum outside air, return and relief shall provide tight closure and full opening, smooth and free operation.
    c. Supply, return, exhaust and transfer grilles, registers and diffusers shall be installed.
    d. Air handling systems, units and associated apparatus, such as heating and cooling coils, filter sections, access doors, etc., shall be blanked and sealed to eliminate excessive bypass or leakage of air.
    e. Fans (supply and exhaust) operating and verified for freedom from vibrations, proper fan rotation and belt tension; overload heater elements shall be of proper size and rating; record motor amperage and voltage and verify that these functions do not exceed nameplate ratings.
    f. Furnish or revise fan drives or motors as necessary to attain the specified air volumes.
3. AUTOMATIC CONTROLS:
    a. Verify that control components are installed in accordance with project documents and functional, electrical interlocks, damper sequences, air and water resets, fire and freeze stats.
    b. Controlling instruments shall be functional and set for design operating conditions. Factory precalibration of room thermostats and pneumatic equipment will not be acceptable.
    c. The temperature regulation shall be adjusted for proper relationship between the controlling instruments and calibrated by the TAB Contractor. Advise Engineer of deficiencies or malfunctions.

I. Contractor shall repair any insulation removed from piping system by TAB Contractor during water balancing.

3.2 SERVICES OF THE TAB FIRM

A. The TAB firm will act as liaison between the Owner, Engineer, and the Contractor and inspect the installation of mechanical piping system, sheet metal work, temperature

controls and other component parts of the heating, air conditioning and ventilating systems being retrofitted, repaired, or added under this Contract. The reinspection of the Work will cover that part related to proper arrangement and adequate provision for the testing and balancing and will be done when the Work is 80 percent complete. The TAB firm will cooperate with the Commissioning Agent that commissions the project.

B. Upon completion of the installation and start-up of the mechanical equipment, to check, adjust, and balance system components to obtain optimum conditions in each conditioned space in the building. Prepare and submit to the Engineer complete reports on the balance and operations of the systems.

C. Measurements and recorded readings of air, water, and electricity that appear in the reports will be done by the permanently employed technicians or engineers of the TAB firm.

D. Make an inspection in the building during the opposite season from that in which the initial adjustments were made. At the time, make necessary modifications to the initial adjustments required to produce optimum operation of system components to affect the proper conditions as indicated on the Drawings. At time of opposite season check-out, the Owner's representative will be notified before readings or adjustments are made.

E. In fan systems, the air quantities indicated on the Drawings may be varied as required to secure a maximum temperature variation of two degrees within each separately controlled space, but the total air quantity indicated for each zone must be obtained. It shall be the obligation of the Contractor to furnish or revise fan drive and motors if necessary, without cost to the Owner, to attain the specified air volumes.

F. Contractor shall utilize ultrasonic flow meter to balance water flow of existing water system if the original pressure drop data is not available. Contractor shall remove insulation as necessary to use flow meter.

## 3.3 PROFESSIONAL REPORT

A. Before the final acceptance of the report is made, the TAB firm will furnish the Engineer the following data to be approved by the Owner and Engineer:

1. Summary of main supply, return and exhaust duct pitot tube traverses and fan settings indicating minimum value required to achieve specified air volumes.
2. A listing of the measured air quantities at each outlet corresponding to the temperature tabulation as developed by the Engineer and TAB firm.
3. Air quantities at each return and exhaust air handling device.
4. Static pressure readings entering and leaving each supply fan, exhaust fan, filter, coil, balancing dampers and other components of the systems. Including the retrofit Work. These readings will be related to performance curves in terms of the CFM handled if available.
5. Motor current readings at each equipment motor on load side of capacitors. The voltages at the time of the reading shall be listed.
6. The final report shall certify test methods and instrumentation used, final velocity reading obtained, temperatures, pressure drops, RPM of equipment, amperage of motors, air balancing problems encountered, recommendations and uncompleted punch list items. The test results will be recorded on standard forms.

7. A summary of actual operating conditions shall be included with each system outlining normal and ventilation cycles of operation. the final report will act as a reference of actual operating conditions for the Owner's operating personnel.

3.4 BALANCING AIR CONDITIONING SYSTEM

A. GENERAL:

1. Place all equipment into full operation, and continue operating during each working day of balancing and testing. If the air conditioning system is balanced during Off-Peak cooling season Contractor shall return to rebalance air side system as required to put system in proper balance at that season.
2. The Contractor shall submit detailed balancing and recording forms for approval. After approval by the Engineer, prepare complete set of forms for recording test data on each system. All Work shall be done under the supervision of a Registered Professional Engineer. All instruments used shall be accurately calibrated to within 1% of scale and maintained in good working order.
3. Upon completion of the balancing and testing, the TAB Contractor shall compile the test data in report forms, and forward five copies to the Engineer for evaluation.
4. The final report shall contain logged results of all tests, including such data as:
   a. Tabulation of air volume at each outlet.
   b. Outside dry bulb and wet bulb temperature.
   c. Inside dry bulb and wet bulb temperatures in each conditioned space room or area.
   d. Actual fan capacities and static pressures. Motor current and voltage readings at each fan.

B. AIR SYSTEMS: Perform the following operations as applicable to balance and test systems:

1. Check fan rotation.
2. Check filters (balancing shall be done with clean filters).
3. Test and adjust blower rpm to design requirements.
4. Test and record motor full load amperes.
5. Test and record system static pressures, suction and discharge.
6. Test and adjust system for design cfm, return air and outside air (±2%). Change-out fan sheaves as required to balance system.
7. Test and record entering air temperatures, db and wb.
8. Test and record leaving air temperatures, db and wb.
9. Adjust all zones to design cfm (±2%).
10. Test and adjust each diffuser, grille, and register to within 5% of design.

C. AIR DUCT LEAKAGE: (From SMACNA Duct Standards latest edition) Test all ductwork (designed to handle over 1000 CFM) as follows:

1. Test apparatus
   The test apparatus shall consist of:
   a. A source of high pressure air--a portable rotary blower or a tank type vacuum cleaner.

b. A flow measuring device consisting of straightening vanes and an orifice plate mounted in a straight tube with properly located pressure taps. Each orifice assembly shall be accurately calibrated with its own calibration curve. Pressure and flow readings shall be taken with U-tube manometers.

2. Test Procedures
   a. Test for audible leaks as follows:
      1) Close off and seal all openings in the duct section to be tested. Connect the test apparatus to the duct by means of a section of flexible duct.
      2) Start the blower with its control damper closed.
      3) Gradually open the inlet damper until the duct pressure reaches 1.2 times the standard designed duct operating pressure.
      4) Survey all joints for audible leaks. Mark each leak and repair after shutting down blower. Do not apply a retest until sealants have set.
   b. After all audible leaks have been sealed, the remaining leakage should be measured with the orifice section of the test apparatus as follows:
      1) Start blower and open damper until pressure in duct reaches 25% in excess of designed duct operating pressure.
      2) Read the pressure differential across the orifice on manometer No. 2. If there is no leakage, the pressure differential will be zero.
      3) Total allowable leakage shall not exceed one (1) percent of the total system design air flow rate. When partial sections of the duct system are tested, the summation of the leakage for all sections shall not exceed the total allowable leakage.
      4) Even though a system may pass the measured leakage test, a concentration of leakage at one point may result in a noisy leak which must be corrected.

END OF SECTION

**SECTION 23 07 13 - DUCT INSULATION**

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. Section 23 02 00 - Basic Materials and Methods is included as a part of this Section as though written in full in this document.

1.2 WORK INCLUDED

A. Ductwork system insulation.

1.3 RELATED SECTIONS

A. Section 23 05 13 – Common Motor Requirements for HVAC Equipment

B. Section 23 05 53 – Identification for HVAC Piping and Equipment

1.4 QUALITY ASSURANCE

A. Installer's Qualifications: Firm with at least 5 years successful installation experience on projects with mechanical insulations similar to that required for this project.

B. Flame/Smoke Ratings: Provide composite mechanical insulation (insulation, jackets, coverings, sealers, mastics and adhesives) with flame-spread index of 25 or less, and smoke-developed index of 50 or less, as tested by ASTM E 84 (NFPA 255) method.

1. Exception: Outdoor mechanical insulation may have flame spread index of 75 and smoke developed index of 150.

C. Duct and plenum insulation shall comply with minimum R-value requirements of latest International Energy Conservation Code.

D. Adhesive and other material shall comply with NFPA and NBFU Standards No. 90A and 90B.

1.5 WARRANTY

A. Warrant the Work specified herein for one year against becoming unserviceable or causing an objectionable appearance resulting from either defective, or nonconforming materials and workmanship.

B. Defects shall include, but not be limited to, the following:

1. Mildewing.
2. Peeling, cracking, and blistering.

3. Condensation on exterior surfaces.

1.6 SUBMITTALS

A. SHOP DRAWINGS: Indicate size, material, and finish. Show locations and installation procedures. Include details of joints, attachments, and clearances.
B. PRODUCT DATA: Submit schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, product variations, and accessories.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver insulation, coverings, cements, adhesives, and coatings to site in unopened containers with manufacturer’s stamp, clearly labeled with flame and smoke rating, affixed showing fire hazard indexes of products.

B. Protect insulation against dirt, water and chemical and mechanical damage. Do not install damaged or wet insulation; remove such from project site.

PART 2 - PRODUCTS

2.1 GENERAL DESCRIPTION

A. The type of insulation and its installation shall be in strict accordance with these specifications for each service, and the application technique shall be as recommended by the manufacturer. All insulation types, together with adhesives and finishes shall be submitted and approved before any insulation is installed. All duct insulation shall be duct wrap.

B. A sample quantity of each type of insulation and each type of application shall be installed and approval secured prior to proceeding with the main body of the Work.

2.2 ACCEPTABLE MANUFACTURERS

A. Glass fiber materials shall be as manufactured by Knauf, Certain-Teed, Johns-Manville, Kingspan Corporation or Owens-Corning and shall have the same thermal properties, density, fire rating, vapor barrier, etc., as the types specified herein, subject to review by the Engineer.

B. Adhesives shall be as manufactured by Minnesota Mining, Arabol, Benjamin-Foster, Armstrong or Insulmastic, Inc., and shall have the same adhesive properties, fire rating, vapor seal, etc., as the types specified herein, subject to review by the Engineer.

C. Ceramic fiber materials shall be as manufactured by Primer Refractories, A.P. Green Refractories or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

A. All insulation shall be installed in accordance with the manufacturer's recommendations

and printed installation instructions.

B. All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items required as per manufacturer's requirements.

3.2 EXTERNAL DUCT INSULATION

A. Fasten all longitudinal and circumferential laps with outward clinching staples 3" on center. On rectangular ducts over 24" wide apply as above and hold insulation in place on bottom side with mechanical pins and clips on 12" centers.

B. Seal all joints, fastener penetrations and other breaks in vapor barrier with 3 inch wide strips of white glass fabric embedded between two coats of vapor barrier mastic, Childers CP-30 or approved equal.

C. All external duct insulation shall be Johns Manville Microlite EQ or Microlite XG fiberglass duct wrap insulation with reinforced aluminum facing or approved equal.

D. External duct wrap is required on all outside air ducts, supply and return air ducts that are not internally insulated. Duct wrap shall be provided as follows:

1. 1½” thick, 1.0 PCF density minimum when ducts are located in conditioned spaces.
2. 2” thick with a minimum installed R-value of 6 when ducts are located in unconditioned spaces, such as ceiling plenum space.

3.3 AIR DEVICE AND MISCELLANEOUS DUCT INSULATION

A. The backside of all supply air devices shall be insulated with taped and sealed 1½ inch thick external duct wrap.

B. The contractor shall install an additional layer of 1½ inch thick external fiberglass duct wrap on any portion of the supply air, return air, outside air, or exhaust air system that has condensation forming during any period of operation. The insulation shall be taped and sealed and located until all evidence of the condensation has been eliminated, at no additional cost to the Owner.

END OF SECTION

# SECTION 23 09 63 - ENERGY MANAGEMENT AND CONTROL SYSTEM (EMCS)

## PART 1 - GENERAL

### 1.01 GENERAL

A. The existing Energy Management and Control System (EMCS) is comprised of a Local Area Network (LAN) infrastructure, Operator Workstations (OWS), Engineering Workstations (EWS), a Primary Network Server (PNS), Network Area Controllers (NAC), Application Specific Controllers (ASC), Unitary System Controllers (USC), and Field Devices installed within the facility.

B. All EMCS controllers shall communicate using the protocols and network standards as defined by ANSI/ASHRAE Standard 135-2010, latest revision. Management level TCP/IP Ethernet network speeds shall be 1 Gbps minimum and the Automation Level MS/TP network speeds shall be 76.8 Kbps minimum.

C. Facility Operators shall be able to view and configure systems through the standard web browser and all graphical/data representations shall appear identical, whether the user is on site or viewing via the Internet at a remote location. Standard operator functions such as control point manipulation, configuration and viewing of trends, schedules and alarms shall be performed through the standard browser. Each mechanical system and building floor plan shall be depicted on the operator workstation by point-and-click graphics.

D. The EMCS shall directly control HVAC equipment as specified in the Sequence of Operations. Furnish Energy Conservation features such as Optimal Start/Stop, Night Setback, Setpoint Reset logic, and Demand Control Ventilation.

E. The EMCS vendor shall provide the following additional services as part of this specification: warranty and service during the warranty period; submittals, samples and record documentation; comprehensive startup and testing of the EMCS with documentation; training services for the owner and facility operators; coordination with other contractors and suppliers; operator and technician training program, and shall cooperate fully with the Project Commissioning Agent.

F. Products furnished under this specification but installed by other.

1. Mechanical devices installed under Division 23 by the mechanical contractor or other suppliers: temperature sensing thermowells; automatic control valves; pipe taps for flowmeters; water pressure sensors and switches; automatic control dampers not installed in air handling unit mixing boxes or louver schedules; damper actuators for variable air volume (VAV) terminal units; mounting cost of controller and actuator for VAV terminal units.

2. Electrical devices installed under Division 26 by the electrical contractor:

   a. 120 VAC power to controllers and control panels at locations indicated on the drawings. Review and verify that these locations are adequate for the proposed EMCS.

   b. Interlock wiring to duct mounted smoke detector or fire alarm shutdown relays to HVAC equipment motor starters and variable frequency drives (VFD).

G. Provide and install all interconnecting cables between all operator's terminals and peripheral devices (such as printers, etc.) supplied under this section.

1.02 RELATED DOCUMENTS & REFERENCES

A. Drawings and general provisions of the contract documents, apply to this section including:

1. Division 01 for General Conditions and Supplementary Conditions.
2. Division 21 for fire protection equipment.
3. Division 22 for plumbing equipment and domestic water systems.
4. Division 23 for mechanical equipment, ductwork, and piping systems.
5. Division 26 for electrical equipment, lighting control, and fire alarm systems.

B. The latest edition of the following standards and codes in effect as approved by the authority having jurisdiction and amended as of supplier's proposal date, and any applicable subsections thereof, shall govern design and selection of equipment and material supplied:

1. ANSI MC85.1 - Terminology for Automatic Control.
2. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).
3. ANSI/ASHRAE Standard 135-2010, BACnet.
4. BTL Mark by the BACnet Testing Laboratories.
5. Uniform Building Code (UBC), including local amendments.
6. UL 916 Underwriters Laboratories Standard for Energy Management Equipment. Canada and the US.
7. National Electrical Code (NEC).
8. FCC Part 15, Subpart J, Class A.
9. National Institute of Standards and Technology (NIST).
10. IEEE STD 802-1990: IEEE Standards for Local and Metropolitan Networks, Overview and Architecture.

1.03 RELATED WORK IN OTHER SECTIONS

A. Refer to Division 00 and Division 01 for allowances and related contractual requirements.

B. Refer to Division 21 for General Fire Protection Provisions and fire suppression pump.

1. The EMCS contractor shall provide communications integration via BACnet/IP interface to each installed system listed above. BACnet MS/TP acceptable if IP interface is not available from equipment manufacturer.
2. The EMCS contractor shall coordinate with all vendors providing above systems to obtain communications requirements and points lists. Map all available points to EMCS.

C. Refer to Division 22 for General Plumbing Provisions, domestic water heating systems, domestic water pumping systems, and domestic water metering.

1. The EMCS contractor shall provide communications integration via BACnet/IP interface to each installed system listed above. BACnet MS/TP acceptable if IP interface is not available from equipment manufacturer.

2. The EMCS contractor shall coordinate with all vendors providing above systems to obtain communications requirements and points lists. Map all available points to EMCS.

D. Refer to Division 23 for General Mechanical Provisions for equipment such as chillers, cooling towers, boilers, pumps, air-handling units, terminal units, ventilation fans, variable frequency drives, unitary AC units, etc.

1. The EMCS contractor shall provide communications integration via BACnet/IP interface to each installed system listed above. BACnet MS/TP acceptable if IP interface is not available from equipment manufacturer.

2. The EMCS contractor shall coordinate with all vendors providing above systems to obtain communications requirements and points lists. Map all available points to EMCS.

E. Refer to Section 26 for General Electrical Provisions for equipment such as electrical switchgear control, electrical power monitoring, emergency generators, lighting control system, etc.

1. The EMCS contractor shall provide communications integration via BACnet/IP interface to each installed system listed above. BACnet MS/TP acceptable if IP interface is not available from equipment manufacturer.

2. The EMCS contractor shall coordinate with all vendors providing above systems to obtain communications requirements and points lists. Map all available points to EMCS.

## 1.04 ELECTRICAL POWER PROVISIONS

A. Primary power will be provided under Division 26 by the electrical contractor to the panel locations indicated on the mechanical & electrical drawings. Provide step down transformers within panel enclosures. Provide all necessary fuses and circuit protection devices

B. Power will be provided to the controllers serving fan powered terminal units with electric heat via the control transformer provided with the unit.

C. All components of the EMCS shall be powered from the sources above. Provide final terminations from the locations indicated on the Division 23 Drawings.

D. The EMCS Contractor shall provide any additional control power that is required as part of this contract and not indicated by other. This shall include all conduit, cabling, circuit breakers, etc.

## 1.05 CONTRACTOR QUALIFICATIONS

A. The EMCS Contractor shall:

1. Have a local staff of trained personnel capable of giving instructions and providing routine and emergency maintenance on the EMCS, all components and software/firmware and all other elements of the EMCS.
2. Have a proven record of experience in the supply and installation of equivalent BACnet systems over a minimum period of five years. Provide documentation of at least three equal and complexity, if so requested by the Owner's Representative.
3. Be a factory certified representative of the native BACnet EMCS manufacturer for design, installation, and service of the proposed system.
4. Have comprehensive local service, training and support facilities for the total EMCS as provided. Maintain local, supplies of essential expendable parts.

1.06 SUBMITTALS

A. ALL DOCUMENTS SUBMITTED SHALL BE IN NATIVE PDF FORMAT. NO SCANS.

B. Shop Drawings:

1. The following information shall be included on the cover page for each shop drawing and equipment documentation submittal:
   a. Project name with date. Refer to the applicable specifications by name and number.
   b. Provide submittal number and re-submittal number and date as applicable.
   c. Provided name and address of Consulting Engineer, Mechanical Contractor, General Contractor
2. Shop drawings shall be CAD generated, plot size of 8-1/2" x 11" or 11" x 17". Drawings shall include diagrams, mounting instructions, installation procedures, equipment details and software descriptions for all aspects of the system to be installed.
3. Provide schematic of systems indicating instrumentation locations, all interconnecting cables between supplied cabinets on a mechanical floor plan.
4. Software specifications and descriptions including operating sequences.
5. Provide a bill of material that indicates specific manufacturer, part number, part description and quantity of each device for all system components.
6. Provide a list of the wire labels to be installed on each end of the control wiring, at the device and the control panel terminal. Labels shall be machine generated, typed and legible with a maximum of 17 characters. The label description "AHU-1 SAT" shall indicate the supply air temperature of AHU-1.
7. Equipment Schematic: Provide an electronic equipment schematic for each piece of mechanical equipment. The schematic shall display all mechanical equipment characteristics including fans, dampers, valves, sensors and other applicable control devices. The schematic shall show wiring terminations to each control device as shown in the submittal and as-build documentation. Control devices shall be labeled by a symbol that can easily be identified in a bill of material that

is shown on this graphic. The bill of material shall show the device symbol, description, manufacture and part number.

8. Sequence of Operations: The control sequences shall be viewable for each piece of mechanical equipment and be in a text format as shown in the as built documentation. The sequence of operations shall be selectable at the applicable location for the control program.

C. Control component submittals:

1. Component technical data sheets with mounting and installation details.

2. The documentation shall include comprehensive and complete details of the BIBB and automation level documentation including address, associated controller type, etc. as required and for the interface to the EMCS.

3. Details of networks/communications equipment, cabling and protocols proposed. Provide schedule of cabling including details of proposed cable types.

4. Module Drawing: Provide an electronic wiring diagram of each control module (as shown in submittal documentation). Diagram shall display wiring schematic and terminations to end devices. Diagram shall display each input and output terminals and label those that are used for the control application. Diagram shall display module type/name and network address.

5. Field sensor and instrumentation specification sheets. Provide complete manufacturer's specifications for all items that are supplied. Include vendor name of every item supplied.

6. Schedule and specification sheets for dampers, valves and actuators.

7. Design and provide layout of all components of panel mounted control devices, terminal strips and power supplies.

D. Color graphics: Provide sample layout of color graphic representations of the systems for review. The submittal shall indicate the quality of the graphic to be provided with the system with a sample of the specific control points to be included. Control points shall as a minimum include points indicated in the input/output summary, control schematic and primary controlling points defined in the sequences of operation. Provide a sample of a floor plan layout, typical AHU, terminal unit, outside air pretreatment unit, variable frequency drive, exhaust/supply fan, chiller plant and hot water plant. For control points to be provided by equipment BACnet integration provide sample of the control points, up to 25 total.

E. Verification Reports. The submittal shall include a sample of the verification reports to be utilized during the verification section of this specification. Sample reports shall be approved as submitted or be modified by the engineer or owner's representative. The verification reports shall be included in the final Operation & Maintenance Manuals. Reports shall be provided in electronic PDF format.

1. Project Systems Verification Form for each controller.

a. General information for each form shall include: project name; associated equipment with mark number; control panel number and location; controller number and model number; controller device

instance number (address); MS/TP LAN segment number; verifying technician and date.

b. Each connected control point and device shall contain the following columns with a separate line for each connected physical point: point description (same as device label); input/output number for each connected control device (AI-XX, AO-XX, DI-XX, or DO-XX).

c. Check boxes confirming that the verification tasks have been completed: device location, proper termination at device; proper termination at control panel; sequence is verified; point trend is enabled.

d. Data entry boxes indicating measured/confirmed values: preliminary control point value on the graphic; observed control point value; calibration or adjustment value to correct offset; final displayed point value on the color-graphic; date of verification; engineer or owner's representative verification.

2. Control Panel Verification Form for each control panel.

a. General information: panel location and identification number; panel dimensions and NEMA rating; panel properly installed; Class 1 and Class 2 wiring are properly separated; correct voltage to the panel; no shorts or grounds in panel; no induce voltages in panel wiring; point to point termination match submittal; devices are mounted in the correct location; controller software revision number; address of controllers; panel device checkout is complete; panel startup is complete.

3. Sequence of Operation Verification Form per piece of equipment (AHU, VAV, chiller, boiler, etc.).

a. General information: project name; system identifier; building area served; control panel and controller numbers; controller model number and instance number (address); MS/TP LAN segment number; name of verifying technician and date.

b. Each step of the sequence of operation for each piece of equipment shall be documented shall include a "description of test", "input to trigger test" and "expected outcome". A pass/fail checkbox shall indicate each of these actions. Provide space for technician approval with associated date.

F. Operating and Maintenance (O&M) manuals: Provide O&M manual with full information to allow the owner to operate, maintain and repair installed products. Include trade names with model numbers, color, dimensions and other physical characteristics.

1. Format: Produce on 8-1/2 x 11-inch pages, and bind in 3-ring/binders with durable plastic covers. Label binder covers with printed title "OPERATION AND MAINTENANCE MANUAL", title of project, and subject matter and "Number _ of _" of binder. Provide substantial dividers tabbed and titled by section/component number.

2. Table of Contents for each volume:

a. Part 1: Directory with name, address and telephone number of Designer, Contractor and Subcontractors and Suppliers for each Project Manual section.

b. Part 2: Operation and maintenance instructions, arranged by Project Manual Section number where practical and where not, by system. Include:

3. Product design criteria, functions, normal operating characteristic and limiting conditions. Installation, alignment, adjustment, checking instructions and troubleshooting guide. Operating instructions for start-up, normal operation, regulation and control, normal shutdown and emergency shutdown. Test data and performance curves.

4. Spare parts list for operating products, prepared by manufacturers including detailed drawings giving location of each maintainable part, lists of spares recommended for user- service inventory and nearest source of in-stock spares.

G. Record Documentation:

1. Details of all alarm, diagnostic, error and other messages. Detail the Operator action to be taken for each instance.

2. Detail special programs provided and provide a complete programming instruction manual. Detail operation of all software applications.

3. Detailed list of the database for all installed devices.

4. Record drawings shall be CAD generated and shall include final locations and point ID for each monitored and controlled device.

5. In additional to the required hard copies, provide a CD-ROM with all of the record documentation in PDF format and a CD-ROM containing backup copies of all installed software and graphics.

6. Online as-built documentation: provide digital replications of as-builts that shall be accessible from each equipment graphic controlled or monitored by the EMCS.

## 1.07 WARRANTY

A. Warranty work and the equipment provided under this contract shall be for a period of one year from the date of Substantial Completion. Warranty shall cover all components, system software, parts and assemblies supplied by this contractor and shall be guaranteed against defects in materials and workmanship for one (1) year from the date of Substantial Completion. Labor to troubleshoot, repair, reprogram or replace system components that have failed due to defects in materials and workmanship shall be provided by this contractor at no charge to the owner during the warranty period. All corrective software modifications made during warranty service periods shall be updated on all user documentation and on user and manufacturer archived software disks. All warranty work shall be performed by the EMCS contractor’s local service group.

B. Warranty shall not include routine maintenance, e.g., equipment cleaning, mechanical parts lubrication, pilot lamp replacement, operational testing, etc. Warranty shall not cover repair or replacement of equipment damaged by under- or over-voltage, misuse, lack of proper maintenance, lightning, water damage from weather or piping failure.

C. Hardware and software personnel supporting this warranty agreement shall provide on-site or off-site service in a timely manner after failure notification to the EMCS

contractor. The maximum acceptable response time to provide this service at the site shall be 24 hours, during normal working hours.

1.08 OPERATIONS PERSONNEL TRAINING

A. Provide a training session for the owner's operations personnel. Training session shall be performed by a qualified person who is knowledgeable in the subject system/equipment. Submit a training agenda two (2) weeks prior to the proposed training session for review and approval. Training session shall include at the minimum:

1. Purpose of equipment.
2. Principle of how the equipment works.
3. Important parts and assemblies.
4. How the equipment achieves its purpose and necessary operating conditions
5. Most likely failure modes, causes and corrections.
6. On site demonstration that includes hands-on demonstration of the manipulation of setpoints, schedules and other adjustable elements of the system.
7. The demonstration shall be on the actual, completed graphic interface pages for the specific project.

B. Provide a second training session 3 months after initial session for any follow-up or additional training requested by owner's personnel. Allow 3 hours for the second training session.

PART 2 - PRODUCTS

2.01 THE ACCEPTABLE EMCS VENDORS ARE;

A. AUTOMATED LOGIC - Branch Office

2.02 VAV TERMINAL UNIT CONTROLLER (TUC)

A. All devices required for single loop control shall be terminated on a single controller. (for example, terminal unit air valve control. The flow sensor and the actuator control signal.)

B. The EMCS Contractor shall provide all controllers required for all variable air volume (VAV) terminal units. The number and location of terminal units and airflow rates shall be as indicated on the mechanical drawings.

C. The TUC shall be capable of monitoring and controlling the following parameters for VAV terminal units per the sequences of operation and input/output summary: space temperature; primary air flow rate; damper modulation; heating coil stage control, heating valve control, heating SCR control (as applicable); fan on/off control; supply air sensor; occupancy senor; carbon dioxide sensor or humidity sensor.

D. Furnish primary damper actuators, for factory mounting, meeting the following requirements: direct shaft mounting; adequate torque, to properly operate the damper

from fully open to fully closed without binding; locking “V” groove or similar means to prevent slippage between actuator and shaft.

E. The EMCS Contractor shall field install the following components for each terminal unit: space temperature sensor; supply air temperature sensor; occupancy sensor, and carbon dioxide sensor as indicated on the Mechanical Drawings.

F. The EMCS Contractor shall furnish to the terminal unit manufacturer the following components for factory installation and wiring for each terminal unit: VAV controller with integral differential pressure transducer and damper actuator.

G. The terminal unit manufacturer may provide the following components for each terminal unit for interface and mounting of the TUC: primary air dampers; enclosure to house the TUC and associated components including suitable mounting brackets shall be NEMA 1 rating and located outside the terminal unit; multi-point averaging type flow sensor at the primary air inlet to the terminal unit; 24 VAC control transformer; 24 VAC fan control relay interface; 24 VAC heater control relay interface (up to two stages); 24 volt SCR heater input as scheduled (0-10 Vdc or 4-20 mA).

H. Any items required for proper operation but not provided by TU vendor, shall be provided under this section.

## 2.03 SOFTWARE OVERVIEW

A. Dynamic Colored Floor plans: Dynamic colored floor plans that compare actual space conditions to setpoints shall be provided on all floorplan graphics displayed on the front-end. Floorplan enlargements shall also use the thermographs to display space conditions. Zones within the set point range shall appear transparent white. As the space gets warmer the zone color shall gradually modulate from transparent white to transparent red to identify a hot zone. As the space conditions get cooler the zone color shall gradually modulate from transparent white to transparent blue to identify a cold zone. Each zone shall indicate the current actual zone temperature within the zone. The floor plans shall use a dynamic scheduling icon to indicate schedule occupancy for each zone and provide direct one-click access to that zones unique schedule. Provide a designated icon or symbol indicating that the zone is in the occupied/unoccupied condition. From the floorplan graphic, the operator shall be able to click on any zone and go directly to the graphic for the piece of equipment controlling that zone. All dynamic floor plans shall be visible via web interface as well as on the LAN. The authorized system operator shall be able to change the zone or system identifier (or name) on the graphic and that change shall be distributed to other associated graphics and to the equipment controller.

B. Pop up Trends: Provide trend logs that automatically pop up when the operator mouse clicks on the point from the graphic. Provide pop up trends for all dampers, control valves, temperature sensors, carbon dioxide sensors, humidity sensors, airflows, static pressures, flow meters, VFD speeds, etc. The EMCS contractor shall set up all trends for the owner. The pop-up trend shall include a trend tool that allows the operator to modify the trend time scale and sample interval for up to 10 sample values. The trends shall be graphical on the computer screen but shall provide an output as an .xls, .csv, .pdf, HTML, r text file.

C. Interactive Maps: Implement JAVA SCRIPT API 3.0 or newer, such as Google Interactive maps depicting the facility location to indicate the site plan. This is not a static image and must be completely interactive.

D. Custom User HTML applications: The EMCS shall utilize HTML applications as an extra feature. At minimum, provide 7-day forecast, weather radar, traffic map and hurricane tracker. All of these features shall be imbedded into the EMCS system.

E. Provided a web-based EMCS platform; contractor shall provide an Open License software. Licenses that are not open are not acceptable. There shall be no per seat or per user licensing fee charged to the owner by the contractor.

F. System shall use the BACnet protocol for communication to the operator workstation or web server and for communication between control modules. Schedules, setpoints, trends, and alarms shall be BACnet Objects.

G. User access shall include 50 assigned operators that shall include five levels of access within the web system. Each operator log-in shall have an expiration date to allow for temporary access to the system. The operator's access description shall include his e-mail address and cell/phone numbers. The operator access can be limited from 5 minutes to permanent access. The user shall be limited to eight bad login attempts before being locked out of the system.

H. Global modification: Provide the capability for global modification of user definable parameters of all points shall be provided. Global modification is defined as the mass adjustment of user definable parameters across a defined group, area, facility, campus, or network. Parameters shall include, but not be limited to temperature set point (VAV boxes, AHU Discharge, VAV AHU Static Pressure Setpoints etc.), equipment start/stop, equipment status, valve output signal, VFD speed control signal, and damper position signal. User shall be able to lock the definable parameter to a set value, or adjust a set point to an operator adjustable value. This function shall be accomplished through the standard graphical user interface/workstation and is to be selectively applicable by the user to all controllers on the network, all controllers in a specific facility or all controllers in a specific zone within a specific facility.

I. The system operator shall be able to override the output signal to the valves, dampers, variable frequency drives, etc. with the use of the PC mouse click on the device. The system override shall include a Hand-Off-Auto (HOA) capability. If the output is commanded to the hand position the operator shall designate an output value of 0-100% in 1% increments. The hand override position shall be permanent or expire after a designated time period and revert to the auto position. The color-graphic shall indicate the device that has been overridden by a color change of the output value.

J. For non-emergency in-warranty events the system operator may submit a Service Request directly from the floor plan or system graphic. The web interface shall include the EMCS suppliers contact information including phone numbers and e-mail address. The service request will be logged into the EMCS suppliers service department. A non-response by the assigned technician shall elevate the request to the next highest manager or supervisor until the system operator receives an response that their request has been received and is scheduled for a resolution. All requests for service shall be maintained in the customer's database for future reference. The service request capability may be extended after the expiration of the warranty as part of a service agreement.

K. The web-based system shall be accessible from Tablet PCs and provide the same functionality that is available from personal computers connected through the LAN or WAN to the system operator. The tablet PCs as a minimum shall include an Apple iPad and Google Android based tablet PC. Operation shall include touch screen capability and

use of the tablet keyboard screen. The operator shall be able to view color-graphics, system trends, override setpoints, change time schedules, and override damper and valve positions.

2.04 ENERGY SAVING PROGRAMS

A. Demand Limiting: Monitor total power consumption for each power meter and shed associated loads automatically to reduce power consumption to an operator set maximum demand level.

B. Duty Cycling: Periodically stop and start loads, based on space temperature, and according to various on/off patterns.

C. Automatic Time Scheduling: Self-contained programs for automatic start/stop/scheduling of building loads. Support up to seven (7) normal day schedules, seven (7) "special day" schedules and two (2) temporary schedules.

D. Optimal Start/Stop: Perform optimized start/stop as function of outside conditions, inside conditions, or both. Optimization shall be adaptive and self-tuning, adjusting to changing conditions by modifying occupancy period based upon the desired temperature at beginning and end of the occupancy period. Base optimization on occupancy schedules, outside air temperature, seasonal requirements, and interior room temperature. Employ adaptive model prediction for how long building takes to warm up or cool down under different conditions.

E. Night-Setback Program: Reduce heating space temperature setpoint or raise cooling space temperature setpoint during unoccupied hours in conjunction with scheduled start/stop and optimum start/stop programs.

F. Setpoint Reset: Setpoints for control of variable load systems shall be reset based on load demand, as described in the Sequence of Operations.

G. Calculated Points: Define calculations and totals computed from monitored points (analog/digital points), constants, or other calculated points.

H. Event Initiated Programming: Any data point capable of initiating event, causing series of controls in a sequence.

I. Holiday Scheduling

J. Direct Digital Control: Furnish software so operator is capable of customizing control strategies and sequences of operation by defining appropriate control loop algorithms and choosing optimum loop parameters.

K. Trend logging shall be provided for all points per the input/output summary where there is a change in the analog or binary signal. Each controller shall be capable of storing trend values and then automatically transfer data to the NAC or the NS hard disk. Trend data shall be updated continuously per the operator assigned interval at intervals as low as one minute. Collect samples at intervals specified in minutes, hours, days, or month. Output trend logs as line-graphs or bar graphs. Binary points (input and output) shall only be logged upon a change of value (COV). Display trend samples on workstation in graphic format. Automatically scale trend graph with minimum 60 samples of data in plot of time versus data.

2.05 FIELD INSTRUMENTATION

A. Temperature Sensors: All temperature sensors shall be thermistor type, factory-calibrated to within 0.5 °F, interchangeable with housing appropriate for application. Sensors shall have a temperature curve rated for the application. Sensor wiring terminations shall be in a galvanized box.

1. Outside air temperature sensors shall be installed in weather proof enclosure with ventilated sun-shied
2. Duct mounted temperature sensors shall be averaging type for supply air, mixed air and low temperature applications for air handling units. Duct probe temperature sensor shall be acceptable for terminal units.
3. Space temperature sensors shall contain a backlit LCD digital display and user function keys along with temperature sensor, setpoint adjustment and after-hours override use. Override time may be set in one-hour increments.
4. Thermowell temperature sensors shall be stainless steel probe of length that is equivalent to a minimum of 50% of the pipe diameter. End-to-end accuracy shall be ± 0.5 deg. F. Connection box shall be moisture/water proof with conduit fitting. Furnish the stainless steel thermowell to the mechanical contractor for installation. A thermal conducting grease shall be installed in the thermowell to provide uniform temperature sensing.
5. Provide flat plate stainless steel space temperature sensors with no local setpoint adjustment as indicated on the drawings.

B. Carbon Dioxide Sensors: The sensor shall be capable of monitoring carbon dioxide concentration with an accuracy of +/- 30 parts per million (PPM). The sensor shall produce a linear 0-10 VDC or 4-20 mA signal over the range of 0 to 2000 PPM. The sensor shall measure using non-dispersed infrared (NDIR) technology to measure carbon dioxide gas and shall be;

1. Wall mounted carbon dioxide sensors shall be Veris CWE series or equivalent.
2. Duct mounted carbon dioxide sensor shall be Veris CWD series or equivalent.
3. The EMCS contractor shall utilize the required calibration devices to properly commission and calibrate the sensors per the manufacturer’s requirements.

C. Relative Humidity Sensors: relative humidity sensors shall be a two-wire type, 4-20 mA output proportional to the relative humidity range of 0-100%. The accuracy of the sensors shall be +3% over a range of 5-95% RH.

1. Outdoor relative humidity sensors: provide non-corroding outdoor shield to minimize wind effects and solar heating. Install wall-mount weather proof enclosure with conduit fitting. Sensor shall be Veris HO series, or equivalent.
2. Wall-mounted relative humidity sensor: sensor shall be installed in a wall-mounted enclosure with white cover. Sensor shall be Veris HEW series or equivalent.
3. Duct-mounted relative humidity sensor: sensor shall be provided with a moisture resistant enclosure with conduit fitting. The probe length shall be 8” minimum. Sensor shall be Veris HED series or equivalent.

D. Pressure Transducers:

1. Air pressure sensor: The pressure sensors shall have an input range compatible with the medium being measured. The proportional output signal shall be 0-10 VDC or 4-20 mA. Sensor shall be SETRA Model 264 or equivalent.

2. Water pressure sensors: The pressure sensors shall have an input range compatible with the medium being measured. The proportional output signal shall be 0-10 VDC or 4-20 mA. Sensor shall be SETRA Model 230 or equivalent. Sensor shall be installed with a valved piping bypass and bleed off for each port.

E. Freezestat: Provide freezestats for all chilled water air handling systems that receive more than 10% untreated outside air. Freezestats shall provide vapor tension elements, which shall serpentine the inlet face on all coils. Provide additional sensors, wired in series, to provide one linear foot per square foot of coil surface area. Freezestat shall be manually reset at the switch. Interlock to the associated fan so that fan will shut down when HOA switch is in hand or auto position. Provide time delay relays with a 0-10 minute time delay relay duration to minimize nuisance freezestat trips. Time delay relay shall be adjustable at the associated control panel.

F. Air differential pressure switch: For fan shutdown, provide air differential pressure switches for all fans controlled by a variable frequency drive (VFD) to shut down the associated fan in the event of sensing high differential pressure. Air differential pressure switches shall have an adjustable setpoint with a range of 0-10 inches w.g. with manual reset at the switch. Provide ¼ inch copper tubing with compression fittings to mount to the side of the duct. Sensor shall be DWYER Series 1620 or equivalent.

G. Momentary control relays: Provide momentary control relays as indicated. . Relays shall have coil ratings of 120 VAC, 50 mA or 10-30 VAC/VDC, 40 mA as suitable for the application. Contact ratings shall be 10 amp. Provide complete isolation between the control circuit and the digital output. Relays shall be located in the UC or other local enclosures and have pin-type terminals. Relays shall have LED indication of status.

H. Current sensing relay: Current sensing relays shall be rated for the applicable load. The output relay shall have an accessible trip adjustment over its complete operating range. Enclosure shall have an LED to indicate relay status.

I. Photocell: Ambient light level shall by a photocell in a non-corroding in a weatherproof housing with sun shield suitable for exterior installation. The control signal output shall be 4-20 ma or binary contact closure as specified in the sequences of operation. Mount the photocell on the north side of the building on the roof. The sensor reading shall be 0-750 foot-candles.

J. Occupancy Sensors

1. The dual-technology occupancy ceiling mounted sensor shall be capable of detecting presence in the control area by via Doppler shifts in transmitted ultrasound and passive infrared (PIR) heat changes. Sensor shall utilize Dual Sensing Verification Principle for coordination between ultrasonic and PIR technologies. Detection verification of both technologies must occur in order to activate lighting systems. Sensor shall have a retrigger feature in which detection by either technology shall retrigger the lighting system on within 5 seconds of being switched off. The sensor shall operate at 24 VDC/VAC. WattStopper DT-300 or approve equal.

2. Sensors shall have a time delay that is adjustable with configuration software or shall have a fixed time delay of 5 to 30 minutes, set by a DIP switch. Sensors shall feature a walk-through mode, where lights turn off 3 minutes after the area is initially occupied if no motion is detected after the first 30 seconds.

3. The sensor shall have an additional single-pole, double throw isolated relay with normally open, normally closed and common outputs. The isolated relay is for use with HVAC control, data logging, and other control options. The sensor shall have an LED indicator that remains active at all times in order to verify detection within the area to be controlled.

4.

2.06 DAMPER ACTUATORS:

A. Outside and exhaust air damper actuators shall be mechanical spring return. The actuator mounting arrangement and spring return feature shall permit normally open or normally closed positions of the damper as required.

B. Outside and return air modulating actuators shall utilize analog (proportional) control 0-10 VDC. Actuators shall be driven in both the open and closed directions.

C. Electric damper actuators shall be direct shaft mounted and use a V-bolt and toothed V-clamp causing a cold weld effect for positive gripping. Single bolt or setscrew type fasteners are not acceptable.

D. Single section dampers shall have one electronic actuator direct shaft mounted.

E. Multi-section dampers with electric actuators shall be arranged so that each damper section operates individually. One electronic actuator shall be direct shaft mounted per damper section.

F. Damper actuators shall be BELIMO or equivalent.

1.

2.07 PANELS AND ENCLOSURES

A. Provide panels and enclosures for all components of the EMCS, which are susceptible to physical or environmental damage.

B. Interior panels and enclosures shall meet be NEMA 1 rated painted steel panels with locking door.

C. Exterior mounted panels and enclosures shall be NEMA 4 painted steel panels with locking door.

D. Panels for USCs shall be mounted on the outside of all unit ventilators and fan coil units with three feet of wall clearance in front of them and no higher than 7 feet to the bottom of the panel.

2.08 LABELING and WARNING NOTICES

A. Provide labeling for all control panels and enclosures.

B. Provide labeling of all control wires and input/output points at the controller and at the control device; the label at each end of the wire shall be the same Labels shall be machine generated, typed and clearly legible with a maximum of 17 characters. Hand written labels or labels written on the control wire jacket will not be acceptable. Each label shall be unique to its function and shall reference the applicable system. For example “AHU-1 SAT” will indicate the supply air temperature sensor for AHU-1. Improper labeling shall be removed and shall require re-commissioning of the control device and controller to document correct functionality.

C. Provide high voltage warning notices at all equipment controlled by the EMCS and at all associated motor starters when used by equipment controller.

2.09 CONDUIT AND FITTINGS

A. Provide all conduits, raceways and fittings for the EMCS monitoring, communication and control cabling. All work shall meet all applicable codes.

B. Conduit, where required, shall meet, the requirements specified within Division 26.

C. EMCS monitoring and control cable shall not share conduit with cable carrying voltages in excess of 90 VAC.

2.10 CABLING

A. Provide all cables for the EMCS. Cable shall meet, at minimum, the following requirements:

1. Minimum 98% conductivity stranded copper.
2. Proper impedance for the application as recommended by the EMCS component manufacturer.
3. Monitoring and control cable shall be #18 AWG or larger, dependent on the application. Analog input and output cabling shall be shielded.
4. Management Level Network cable shall be CAT 6, 24 gauge unshielded.
5. Automation Level Network cable shall be #24 AWG shielded.
6. Shield shall be grounded at the CCP, UC, or control panel. Ground at one end only to avoid ground loops.
7. Identification of each end at the termination point. Identification should be indicated on and correspond to the record drawings.

B. 120 VAC power wiring shall be of #12 AWG solid conductor or larger as required.

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION

A. The EMCS supplier shall provide a pre-construction coordination meeting with the affected trades to ensure a cooperative efficient process of installation. The invited trades shall include the general contractor, mechanical contractor, electrical contractor, test and balance contractor, owner’s representative, consulting engineer and others with a direct

interest in the coordination of the affected systems. The EMCS contractor shall provide an outline of the meeting agenda highlighting the construction schedule, coordination with mechanical and electrical trades. Provide a sign-in sheet and submit it through the attendees along with a summary of the meeting notes for future reference.

3.02 INSPECTION DURING INSTALLATION

A. Provide a technician to assist the Engineer or Owner's Representative with inspections made during the installation period that are required to review the progress and quality of ongoing work. The engineer/owner's representative shall generate field observation reports on the findings of the inspection. The engineer or owner's representative shall advise the EMCS contractor during the inspection of any concerns noted with respect to the installation and shall repeat the concerns in writing as soon as possible after the inspection is completed. The EMCS contractor shall take corrective action to meet the requirements of the specifications. Upon correction, the EMCS contractor shall submit written documentation through the contractors to the engineer.

3.03 INSTALLATION OF COMPONENTS

A. Provide all interlock and control wiring. All wiring shall be installed in a neat and professional manner in accordance with specification Division 26 and all national, state and local electrical codes.

B. Provide wire and wiring techniques recommended by equipment manufacturers. Control wiring shall not be installed in power circuit raceways. Magnetic starters and disconnect switches shall not be used as junction boxes. Provide auxiliary junction boxes as required. Coordinate location and arrangement of all control equipment with the Owner's Representative prior to rough-in. Provide auxiliary pilot duty relays on motor starters as required for control function.

C. Electrical Contractor shall provide 120 or 277 volt power at a junction box within 48" of the controller. The BAS Contractor shall coordinate with the Electrical Contractor to identify locations of power requirements prior to the installation of the controls.

D. Conduit for control wiring shall be provided whenever one of the following conditions exists:

1. Conduit is indicated on the drawings or specifically required by the specifications.

2. Cabling runs through inaccessible areas such as within partitions/walls, above closed in ceilings, under floor; within trenches and underground; on the exterior of the building; exposed on the surface of the building; when encased in concrete or other material that makes the cable inaccessible or when located such that access to the cable is not readily obtained.

3. Cable within mechanical, telecommunications and electrical equipment rooms and control rooms.

4. Conduit shall be installed, inside wall from sensor box to above the wall, for all wall mounted temperature, humidity and CO2 sensors.

E. Control wiring located above an accessible ceiling space may be plenum rated cable. Plenum rated wire shall be bundled and routed at right angles to the building lines and secured to the building structure every 15 feet.

F. When communication bus enters or exits a building, a surge suppressor shall be installed. The surge suppressor shall be installed according to the controls manufacturer's instructions.

G. Provide sleeves for all cable and conduit passing through walls, partitions, structural components, floors and roof

H. All sensor wiring shall be labeled to indicate the origination (at the device) and destination of data (at the control panel). The description shall indicate the type and location of the control device such as "AHU-1 SA temp" or "VAV 1-1 space temp".

I. Wall temp sensors at 48" above the finished floor to comply with ADA requirements and to match the height of the light switches. Mount humidity sensor at equal height to wall temperature sensor.

## 3.04 VERIFICATION REQUIREMENTS

A. Verification shall be provided by the EMCS contractor to demonstrate and confirm that the installed system complies with the specifications and the control sequences of operation herein specified. upon completion of the verification process the EMCS contractor shall demonstrate to the engineer or owner's representative the functionality of the control system devices are in compliance with the contract documents.

B. Technicians provided by the EMCS contractor shall be factory trained and qualified in the operation of the provided control system. The EMCS contractor shall provide, if requested, the factory training certificates of the individuals providing the verification services on this project.

C. Verification tools, applicable to the system provided, shall be utilized by the factory-trained technicians for proper verification of system operation and functionality. Temperature verification sensors shall be NIST certified within the last 12 months. Meters such as Fluke 52 series or better shall be utilized. Use of non-certified meters may require the system to be re-verified with certified meters at no cost to the owner.

D. Documentation of the verification process shall be provided per the project general conditions in electronic PDF format as required. Documentation shall include the following forms:

1. Project System Verification Forms for each controller provided on the project to verify the proper function of each controller, control device and system component provided.

2. Panel Verification Forms for each control panel to document the proper installation and function of each control panel provided.

3. Sequence of Operation Verification Forms for each piece of controlled equipment to confirm compliance of the control system with the specified sequences of operation.

4. Not providing proper documentation for each control devices, panel, or system, upon request by the engineer or owner's representative, may require the EMCS contractor to re-verify the applicable systems at no additional cost to the owner.

E. After completion of the verification, the EMCS contractor shall be able to demonstrate the sequence of operations for each system to the engineer and the owner's representative.

F. Equipment checkout sheets are to be produced by this contractor showing checkboxes and compliance with the following procedures for each piece of equipment and turned over to the owner and/or mechanical engineer.

## 3.05 COLORGRAPHICS

A. The existing colorgraphics shall be modified to indicate all new work for the EMCS system prior to system acceptance and owner training.

B. The colorgraphics provided shall include the following as a template. Provide forward and backward links on the graphic.

1. Site plan with link to overall building plan including detached buildings. The site plan shall be referenced to an automatically updated aerial view or map view of the area such as Google Maps or Bing Maps. Provide link to proceed to the overall building floor plan.

2. The overall building plan shall indicate space temperature conditions referenced by the color of the zone. Specific details of the zone temperatures and equipment are not required. Provide a link to the floor plan wings, upper floors and remote buildings.

3. The floor plan colorgraphics shall indicate the space temperatures by color references. Additional information shall indicate the space temperature, the occupancy of the zone, air handling units, VAV terminals and ductwork with diffusers. A link at each terminal unit or AHU shall automatically connect the system operator to the equipment colorgraphic.

4. The colorgraphics for the equipment shall as a minimum be equal to the points from the input/output summary or control schematic. Primary control devices as required by the sequences of operation shall also be provided.

5. Control points from equipment that are integrated into the EMCS via BACnet shall be provided to convey the operating conditions of the attached equipment. Coordination of the integration points shall be accomplished during the submittal phase. The EMCS contractor shall provide a list of all integrated points on their submittal.

## 3.06 CONTROL SYSTEM DEMONSTRATION AND ACCEPTANCE

A. Startup testing documentation: Prepare the checklist documenting startup testing of each input and output device, with technician's initials and date certifying each device has been tested and calibrated prior to acceptance testing. This document shall indicate proof that the following functions have been commissioned and shall be included in the as-built documentation: short to ground check, configuration of trends, confirmation that color-graphics are accurately representing actual systems, point to point checkout, all damper

and valve actuators respond to input change, control modules are addressed and have functional descriptors, specified interlocks are functional, calibration report of all sensors, discrete outputs respond to time schedule or manual enable command.

B. Demonstration. Prior to acceptance, demonstrate the following performance tests to demonstrate system operation and compliance with specifications.

1. Engineer, owner's representative and mechanical contractor shall be invited to observe and review system demonstration. Provide attendees at least 10 days notice.

2. Demonstration shall follow process approved as part of the submittal and shall include complete checklists and forms for each system as part of system demonstration.

3. Demonstrate actual field operation of each sequence of operation as specified. Demonstrate calibration and response of any input and output points requested by engineer or owner's representative.

4. Demonstrate complete operation of operator interface including review of color-graphics, time schedules, trend logs, alarm notification, functionality of tablet PC operation.

a. PID loop response. Supply graphical trend data output showing each PID loop's response to a set point change representing an actuator position change of at least 25% of full range. Trend sampling rate shall be selectable from 10 seconds to 3 minutes, depending on loop speed. Each sample's trend data shall show set point, actuator position, and controlled variable values.

b. Demand limiting. Supply trend data output showing demand-limiting algorithm action. Trend data shall document action sampled each minute over at least a 30-minute period and shall show building kW, demand limiting setpoint, and status of set points and other affected equipment parameters.

c. Trend logs for each system. Trend data shall indicate set points, operating points, valve positions, and other data as specified. Logs shall be accessible through system's operator interface and shall be retrievable for use in other software programs.

5. Alarms and Interlocks. Check each alarm with an appropriate signal at a value that will trip the alarm. Trip interlocks using field contacts to check logic and to ensure that actuators fail in the proper direction. Alarm verification shall include temperatures exceeding alarm threshold (high and low), fan failure safety, duct high static pressure switch, freezestat, and smoke detector shutdown.

6. Tests that fail to demonstrate proper system operation to the engineer shall be repeated after contractor makes necessary repairs or revisions to hardware or software to successfully complete each test.

C. Owner Acceptance.

1. After tests described in this specification are performed to the satisfaction of both engineer and owner's representative, the engineer shall accept the control system as meeting completion requirements. Engineer may exempt tests from

completion requirements that cannot be performed due to circumstances beyond EMCS contractor's control. Engineer shall provide written statement of each exempted test. Exempted tests shall be performed as part of warranty.

2. System shall not be accepted until completed demonstration forms and checklists are submitted and approved by the engineer.

3.07 DEMONSTRATION AND OWNER TRAINING

A. Furnish basic operator training for multiple persons on data display, alarm and status descriptors, requesting data, execution commands and log requests. Include a minimum of 16 hours: 8 hours instructor time for onsite training and 8 hours of hands on class environment training. Training sessions may be provided in 4-hour increments as approved by the owner's representative.

1. Change/modify temperature setpoints.
2. Change/modify time of day, holiday and override schedules.
3. Display, create, and modify trends of system points.
4. Update room numbers on the color-graphics.

B. Demonstrate complete and operating system to Owner. Provide written documentation listing the attendees of the specified training with sign-in sheet and training time and date.

PART 4 - SEQUENCE OF OPERATIONS

A. Fan Powered Terminal Unit Sequence of Operation

Equipment Control Points

Space temperature sensor – AI
Hot water valve - AO
Cold deck flow – velocity sensor - AI
Outdoor air temperature - AI
Cooling damper - AO

**Zone Occupancy**

Each Fan Powered Terminal Unit Box (FPTU) shall have an occupancy/vacancy schedule, occupied heating/cooling setpoints and unoccupied heating/cooling setpoints assigned to it. As the occupancy time approaches, an optimum start/stop program shall calculate a start time based on current space temperature verses the occupied heating or cooling set point, assigned recovery rate, and outdoor air temperature -- all variables are operator assignable from the central site. The FPTU control program shall have the ability to learn its recovery rate whenever the operator enables the learning feature.

**Temperature Control**

When the zone becomes active, the FPTU controller shall determine, based on the space temperature, whether heating or cooling is required. If cooling is required, the cooling air damper shall be modulated open to its operator adjustable maximum cooling CFM set point and a run signal shall be sent to the air handling unit serving the FPTU to achieve a set point of 73 degrees in the summer. As the space temperature returns to set point, the FPTU cooling air damper shall modulate to its operator

adjustable minimum cooling CFM set point of 0 CFM. If heating is required, the terminal unit damper will be maintained at its minimum CFM set point (adjustable). The hot water valve will be modulated to maintain space temperature at the heating set point (adjustable) of 71 in the winter.

**Unoccupied Control**

During the unoccupied time period, the FPTU cooling damper shall be closed (operator adjustable). If the space temperature reaches the operator adjustable unoccupied setpoints of $55^0$F heating and $95^0$F cooling, the required equipment shall be started and run to maintain the space temperature within the setpoints.

END OF SECTION

**SECTION 23 31 13 - METAL DUCTWORK**

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Low pressure ductwork.

B. Medium and high pressure ductwork.

C. Duct cleaning.

1.2 RELATED SECTIONS

Division 9 - Finishes: Weld priming, weather resistant, paint or coating.

A. Section 23 02 00 - Basic Material and Methods.

B. Section 23 05 93 - Testing, Adjusting and Balancing.

C. Section 23 07 13 - Duct Insulation.

D. Section 23 33 00 - Ductwork Accessories.

E. Section 23 37 13 - Air Distribution Devices.

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of metal ductwork products of types, materials and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Installer's Qualifications: Firms with least 3 years of successful installation experience on projects with metal ductwork systems similar to that required for project.

C. Codes and Standards:

1. SMACNA Standards: Comply with latest SMACNA's "HVAC Duct Construction Standards, Metal and Flexible" for fabrication and installation of metal ductwork.
2. ASHRAE Standards: Comply with ASHRAE Handbook, Equipment Volume, Chapter 1 "Duct Construction", for fabrication and installation of metal ductwork.
3. NFPA Compliance: Comply with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems", NFPA 90B "Standard for the Installation of Warm Air Heating and Air Conditioning Systems", and NFPA 96 Standard.
4. IECC 2000: Comply with 2000 International Energy Conservation Code.

1.4 GENERAL DESCRIPTION

A. Extent of metal ductwork is indicated on drawings and in schedules, and by requirements of this section.

1.5 SUBMITTALS

A. Submit shop drawings, duct fabrication standards and product data under provisions of Division One.

B. Indicate duct fittings, particulars such as gauges, sizes, welds, and configuration prior to start of work.

C. The contract documents are schematic in nature and are to be used only for design intent. The contractor shall prepare sheet metal shop drawings, fully detailed and drawn to scale, indicating all structural conditions, all plumbing pipe and light fixture coordination, and all offsets and transitions as required to permit the duct to fit in the space allocated and built. All duct revisions required as a result of the contractor not preparing fully detailed shop drawings will be performed at no additional cost.

1.6 DEFINITIONS

A. Duct Sizes: Inside clear dimensions. Maintain indicated clear size at all fire dampers and fire smoke dampers. Where offsets or transitions are required, the duct shall be the equivalent size based on constant friction rate.

B. Low Pressure: Low pressure ductwork shall be rated for an operating pressure of 2”. Low pressure ductwork shall be defined as all return, exhaust, and outside air ducts, all supply ductwork associated with constant volume air handling units with a scheduled external static pressure of less than 2”, and all supply ductwork downstream of terminal units in variable volume systems.

C. Medium Pressure: Medium pressure ductwork shall be rated for an operating pressure of 6”. Medium pressure ductwork shall be defined as all supply ductwork extending from variable volume air handling units to terminal units in variable volume systems with air handling units having a scheduled external static pressure of less than 6”. The supply ductwork of constant volume air handling units having a scheduled external static pressure greater than 2” and less than 6” shall be rated for medium pressure.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protection: Protect shop-fabricated and factory-fabricated ductwork, accessories and purchased products from damage during shipping, storage and handling. Prevent end damage and prevent dirt and moisture from entering ducts and fittings, use sheet metal end caps on any lined duct exposed to the weather.

B. Storage: Where possible, store ductwork inside and protect from weather. Where necessary to store outside, store above grade and enclose with waterproof wrapping.

PART 2 - PRODUCTS

## 2.1 DUCTWORK MATERIALS

A. Exposed Ductwork Materials: Where ductwork is indicated to be exposed to view in occupied spaces, provide materials which are free from visual imperfections including pitting, seam marks, roller marks, stains and discolorations, and other imperfections, including those which would impair painting.

B. Sheet Metal.: Except as otherwise indicated, fabricate ductwork from galvanized sheet steel complying with ASTM A 527, lockforming quality, with G 90 zinc coating in accordance with ASTM A 525; and mill phosphatized for exposed locations.

C. Stainless Steel Sheet: Where indicated, provide stainless steel complying with ASTM A167; Type 316; with No. 4 finish where exposed to view in occupied spaces, No. 1 finish elsewhere. Protect finished surfaces with mill-applied adhesive protective paper, maintained through fabrication and installation.

D. Aluminum Sheet: Where indicated, provide aluminum sheet complying with ASTM B 209, Alloy 3003, Temper H14.

## 2.2 MISCELLANEOUS DUCTWORK MATERIALS

A. General: Non combustible and conforming to UL 181, Class 1 air duct materials.

B. Flexible Ducts: Flexmaster U.S.A., Inc. Type 3M or approved equal, corrosive resistant galvanized steel formed and mechanically locked to inner fabric with 1” thick insulation when flexible ducts are located in conditioned spaces and with R-5 insulation when located in unconditioned spaces. Flexible duct shall have reinforced metalized outer jacket comply with UL 181, Class 1 air duct.

C. Sealants: Hard-Cast “iron grip” or approved equal, non-hardening, water resistant, fire resistive and shall not be a solvent curing product. Sealants shall be compatible with mating materials, liquid used alone or with tape or heavy mastic.

D. Ductwork Support Materials: Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim and angles for support of ductwork.

1. For exposed stainless steel ductwork, provide matching stainless steel support materials.
2. For aluminum ductwork, provide aluminum support materials.

## 2.3 LOW PRESSURE DUCTWORK

A. Fabricate and support in accordance with latest SMACNA Duct Construction Standards and ASHRAE handbooks, except as indicated. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated.

B. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by approved shop drawings. Obtain engineer’s approval prior to using round duct in lieu of rectangular duct.

C. Construct T's, bends, and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows are used, provide airfoil-turning vanes. Where acoustical lining is indicated, provide turning vanes of perforated metal with glass fiber insulation.

D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible. Divergence upstream of equipment shall not exceed 30 degrees; convergence downstream shall not exceed 45 degrees.

E. Use crimp joints with bead for joining round duct sizes 6 inch smaller with crimp in direction of airflow.

F. Use double nuts and lock washers on threaded rod supports.

2.4 MEDIUM AND HIGH PRESSURE DUCTS

A. Fabricate and support in accordance with SMACNA Duct Construction Standards and ASHRAE handbooks, except as indicated. Provide duct material, gauges, reinforcing, and sealing for operating pressures indicated.

B. Construct T's, bends, and elbows with radius of not less than 1½ times width of duct on centerline. Where not possible and where rectangular elbows are used, provide airfoil-turning vanes. Where acoustical lining is required, provide turning vanes of perforated metal with glass fiber insulation. Weld in place.

C. Transform duct sizes gradually, not exceeding 15 degrees divergence and 30 degrees convergence.

D. Fabricate continuously welded medium and high pressure round and oval duct fittings two gauges heavier than duct gauges indicated in SMACNA Standard. Joints shall be minimum 4 inch cemented slip joint, brazed or electric welded. Prime coat welded joints.

E. Provide standard 45 degree lateral wye takeoffs unless otherwise indicated where 90 degree conical tee connections may be used.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

A. Obtain manufacturer's inspection and acceptance of fabrication and installation of ductwork at beginning of installation.

B. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pitot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.

C. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

D. Connect terminal units to medium or high pressure ducts with four feet maximum length of flexible duct. Do not use flexible duct to change direction.

E. Connect diffusers to low pressure ducts with 6 feet maximum, 4 feet minimum, length of flexible duct. Hold in place with strap or clamp.

F. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

G. The interior surface of all ductwork shall be smooth. No sheet metal parts, tabs, angles, or anything else may project into the ducts for any reason, except as specified to be so. All seams and joints shall be external.

H. All ductwork located exposed on roof shall be "crowned" to prevent water from ponding. Ref: Insulation for additional requirements.

I. Where ducts pass through floors, provide structural angles for duct support. Where ducts pass through walls in exposed areas, install suitable sheet metal escutcheons as closers.

J. All angles shall be carried around all four sides of the duct or group of ducts. Angles shall overlap corners and be welded or riveted.

K. All ductwork shall be fabricated in a manner to prevent the seams or joints being cut for the installation of grilles, registers, or ceiling outlets.

L. All duct hangers shall be attached to building structure. Cutting slots in roof or floor decking for hanger straps to be cast in concrete is not acceptable.

3.2 INSTALLATION OF FLEXIBLE DUCTS

A. Maximum Length: For any duct run using flexible ductwork, do not exceed 6'-0" extended length.

B. Installation: Install in accordance with Section III of SMACNA’s, “HVAC Duct Construction Standards, Metal and Flexible”.

3.3 DUCTWORK APPLICATION SCHEDULE

| AIR SYSTEM | MATERIAL |
|---|---|
| Low Pressure Supply | Galvanized Steel, Aluminum |
| Medium and High Pressure Supply | Galvanized Steel |
| Return and Relief | Galvanized Steel, Aluminum |

| | |
|---|---|
| General Exhaust | Galvanized Steel, Aluminum |

3.4 DUCTWORK HANGERS AND SUPPORTS

A. All ductwork shall be properly suspended or supported from the building structure. Hangers shall be galvanized steel straps or hot-dipped galvanized rod with threads pointed after installation. Strap hanger shall be attached to the bottom of the ductwork, provide a minimum of two screws one at the bottom and one in the side of each strap on metal ductwork. The spacing, size and installation of hangers shall be in accordance with the recommendations of the latest SMACNA edition.

B. All duct risers shall be supported by angles or channels secured to the sides of the ducts at each floor with sheet metal screws or rivets. The floor supports may also be secured to ducts by rods, angles or flat bar to the duct joint or reinforcing. Structural steel supports for duct risers shall be provided under this Division.

3.5 AIR DUCT LEAKAGE: (From SMACNA Duct Standards Latest Edition) Test all ductwork (designed to handle over 1000 CFM) as follows:

A. Test apparatus

The test apparatus shall consist of:

1. A source of high pressure air--a portable rotary blower or a tank type vacuum cleaner.
2. A flow measuring device consisting of straightening vanes and an orifice plate mounted in a straight tube with properly located pressure taps. Each orifice assembly shall be accurately calibrated with its own calibration curve. Pressure and flow readings shall be taken with U-tube manometers.

B. Test Procedures

1. Test for audible leaks as follows:
2. Close off and seal all openings in the duct section to be tested. Connect the test apparatus to the duct by means of a section of flexible duct.
   a. Start the blower with its control damper closed.
   b. Gradually open the inlet damper until the duct pressure reaches 1.5 times the standard designed duct operating pressure.
   c. Survey all joint for audible leaks. Mark each leak and repair after shutting down blower. Do not apply a retest until sealants have set.
3. After all audible leaks have been sealed, the remaining leakage should be measured with the orifice section of the test apparatus as follows:
   a. Start blower and open damper until pressure in duct reaches 50% in excess of designed duct operating pressure.
   b. Read the pressure differential across the orifice on manometer No. 2. If there is no leakage, the pressure differential will be zero.
   c. Total allowable leakage shall not exceed one (1) percent of the total system design air flow rate. When partial sections of the duct system are tested, the summation of the leakage for all sections shall not exceed the total allowable leakage.

d. Even though a system may pass the measured leakage test, a concentration of leakage at one point may result in a noisy leak which, must be corrected.

4. Test Witness
   a. Air duct leakage test shall be witnessed by Owner/Engineer.
   b. The Architect or duly authorized construction inspector shall be notified in writing at least 2 working days prior to each test.

3.6 DUCT SYSTEM CLEANING

A. Duct system cleaning shall be performed in accordance with the current published standards of ASHRAE and NADCA.

B. Duct system cleaning method used shall incorporate the use of vacuum collection devices that are operated continuously during cleaning. A vacuum device shall be connected to the downstream end of the section being cleaned through a predetermined opening. The vacuum collection device must be of sufficient power to render all areas being cleaned under negative pressure, such that containment of debris and the protection of the indoor environment is assured.

C. All vacuum devices exhausting air inside the building shall be equipped with HEPA filters (minimum efficiency), including hand-held vacuums and wet-vacuums.

D. All vacuum devices exhausting air outside the facility shall be equipped with Particulate Collection including adequate filtration to contain debris removed from the HVAC system. Such devices shall exhaust in a manner that will not allow contaminants to re-enter the facility. Release of debris outdoors must not violate any outdoor environmental standards, codes or regulations.

E. Fibrous glass thermal or acoustical insulation elements present in any equipment or ductwork shall be thoroughly cleaned with HEPA vacuuming equipment, while the HVAC system is under constant negative pressure, and not permitted to get wet in accordance with applicable NADCA and NAIMA standards and recommendations.

F. Duct cleaning method used shall not damage the integrity of the ductwork, nor damage porous surface materials such as liners inside the ductwork or system components.

G. Replace the fiberglass material if there is any evidence of damage, deterioration, delamination, friable material, mold or fungus growth, or moisture such that fibrous glass materials cannot be restored by cleaning or resurfacing with an acceptable insulation repair coating.

H. Clean external surfaces of foreign substances which might cause corrosive deterioration of metal or, where ductwork is to be painted, might interfere with painting or cause paint deterioration.

I. Strip protective paper from stainless ductwork surfaces, and repair finish wherever it has been damaged.

J. Temporary Closure: At ends of ducts which are not connected to equipment or air distribution devices at time of ductwork installation, provide temporary closure of polyethylene film or other covering which will prevent entrance of dust and debris until time connections are to be completed.

K. Cleaning Report: Contractor shall provide a report to the Owner indicating the completion of duct cleaning per specification and areas of the duct system found to be damaged and/or in need of repair.

3.7 DUCT JOINTS AND SEAMS

A. Seal all non-welded duct joints with duct sealant as indicated.

**END OF SECTION**

**SECTION 23 33 00 – DUCTWORK ACCESSORIES**

PART 1 – GENERAL

1.1 WORK INCLUDED

A. Volume control dampers.

B. Round Duct Taps.

C. Fire dampers.

D. Combination fire and smoke dampers.

E. Back draft dampers.

F. Air turning devices.

G. Flexible duct connections.

H. Duct access doors.

I. Duct test holes.

1.2 RELATED WORK

A. Section 23 05 48 - Vibration and Seismic Controls for HVAC Piping and Equipment.

B. Section 23 31 13 - Metal Ductwork.

1.3 REFERENCES

A. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

B. SMACNA - Low Pressure Duct Construction Standards.

C. UL 33 - Heat Responsive Links for Fire-Protection Service.

D. UL 555 - Fire Dampers and Ceiling Dampers.

1.4 SUBMITTALS

A. Submit shop drawings and product data under provisions of Division One.

B. Provide shop drawings for shop fabricated assemblies indicated, including volume control dampers duct access doors duct test holes. Provide product data for hardware used.

C. Submit manufacturer's installation instructions under provisions of Division 1, for fire dampers and combination fire and smoke dampers.

PART 2 - PRODUCTS

2.1 VOLUME CONTROL DAMPERS

A. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards, and as indicated.

B. Fabricate splitter dampers of material same gauge as duct to 24 inches size in either direction, and two gauges heavier for sizes over 24 inches.

C. Fabricate splitter dampers of double thickness sheet metal to streamline shape. Secure blade with continuous hinge or rod. Operate with minimum 1/2 inch diameter rod in self aligning, universal joint, action flanged bushing, with set screw.

D. Fabricate single blade dampers for duct sizes to 9-1/2 x 24 inch.

E. Fabricate multi-blade damper of opposed blade pattern with maximum blade sizes 12 x 72 inch.

1. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
2. On outside air, return air, and all other dampers required to be low leakage type, provide galvanized blades and frames, seven inches wide maximum, with replaceable vinyl, EPDM, silicone rubber seals on blade edges and stainless steel side seals. Provide blades in a double sheet corrugated type construction for extra strength. Provide hat channel shape frames for strength and blade linkage enclosure to keep linkage out of the air stream. Construction leakage not to exceed 1/2%, based on 2,000 fpm and 4 inch static pressure.

F. Except in round ductwork 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.

G. Provide locking, indicating quadrant regulators on single and multi-blade dampers. Where rod lengths exceed 30 inches provide regulator at both ends.

H. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.

2.2 ROUND DUCT TAPS

A. Taps to trunk duct for round flexible duct shall be spin-in fitting with locking quadrant butterfly damper, model no. FLD-B03 by Flexmaster or approved equal.

2.3 ACCEPTABLE MANUFACTURERS - [FIRE DAMPERS] [AND] [COMBINATION FIRE AND SMOKE DAMPERS]

A. Greenheck.

B. Louvers and Dampers Inc.

C. Ruskin.

D. Nailor Industries.

E. Pottorff

2.4 FIRE DAMPERS

A. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.

B. Provide curtain type dampers of galvanized steel with interlocking blades. Provide stainless steel closure springs and latches for horizontal installations. Configure with blades out of air stream.

C. Fabricate multiple blade fire dampers per U.L. with 16 gauge minimum galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, 1/8 x 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock.

D. Fusible links, UL 33, shall separate at 160 degrees F. Provide adjustable link straps for combination fire/balancing dampers.

2.5 COMBINATION FIRE AND SMOKE DAMPERS

A. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.

B. Provide factory sleeve for each damper. Install damper operator on exterior of sleeve and link to damper operating shaft.

C. Fabricate with multiple blades with 16 gauge galvanized steel frame and blades, oil-impregnated bronze or stainless steel sleeve bearings and plated steel axles, stainless steel jamb seals, 1/8 x 1/2 inch plated steel concealed linkage, stainless steel closure spring, blade stops, and lock, and 1/2 inch actuator shaft.

1. Operators shall be spring return electric type suitable to operate on 120 V AC, 60 cycle.
2. Operators shall be UL listed and labeled.

2.6 SMOKE DAMPERS

A. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.

B. Motorized Smoke Dampers: multi-blade type, normally open with power on, close automatically when power is interrupted, UL-listed and labeled damper and damper operator.

2.7 ACCEPTABLE MANUFACTURERS – AIR TURNING DEVICES

A. Young Regulator.

B. Titus.

C. Tuttle and Bailey.

D. Substitutions: Under provisions of Division One.

2.8 AIR TURNING DEVICES

A. On duct sizes less than 12 x 12, multi-blade device with blades aligned in short dimension; steel or aluminum construction; with individually adjustable blades, mounting straps.

B. Multi-blade device with radius blades attached to pivoting frame and bracket, steel or aluminum construction, with worm drive mechanism with 18 inch long removable key operator.

2.9 ACCEPTABLE MANUFACTURERS – FLEXIBLE DUCT CONNECTIONS

A. Metaledge.

B. Ventglass.

C. Substitutions: Under provisions of Division One.

2.10 FLEXIBLE DUCT CONNECTIONS TO AIR MOVING EQUIPMENT

A. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards, and as indicated.

B. UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 20 oz per sq yd, approximately 6 inches wide, crimped into metal edging strip.

2.11 ACCEPTABLE MANUFACTURERS – DUCT ACCESS DOORS

A. Greenheck.

B. American Warming and Vent.

C. Ruskin.

D. Titus.

E. Substitutions: Under provisions of Division One.

2.12 DUCT ACCESS DOORS

A. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards and as indicated.

B. Review locations prior to fabrication.

C. Fabricate rigid and close-fitting doors of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, install minimum one inch thick insulation with sheet metal cover. Insulation shall be replaceable without field cutting or patching.

D. Access doors smaller than 12 inches square may be secured with sash locks.

E. Provide two hinges and two sash locks for sizes up to 18 inches square, three hinges and two compression latches with outside and inside handles for sizes up to 24 x 48 inches. Provide an additional hinge for larger sizes.

F. Access doors with sheet metal screw fasteners are not acceptable.

2.13 DUCT TEST HOLES

A. Cut or drill temporary test holes in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

B. Permanent test holes shall be factory fabricated, air tight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions.

B. Balancing Dampers

1. Provide at points on low pressure supply, return, and exhaust systems where branches are taken from larger ducts and as required for air balancing. Use splitter dampers only where indicated.
2. All regulators mounted on externally insulated ductwork shall have 16 gauge elevated platforms at least 1/8 inch higher than the thickness of the insulation. Damper shaft shall have Ventlock No. 607 bearing mounted on ductwork within elevated platform. If duct is inaccessible the operating handle shall be extended and the regulator installed on the face of the wall or ceiling. Where regulators are exposed in finished parts of the building, they shall be flush type, Ventlock No. 666. All regulators shall be manufactured by Ventlock, or approved equal.
3. All dampers in lined ductwork shall have bushing to prevent damper damage to liner.

C. Provide fire dampers at locations indicated, where ducts and outlets pass through fire rated components, and where required by authorities having jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.

D. Demonstrate re-setting of fire dampers to authorities having jurisdiction and Owner's representative.

E. Provide back draft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.

F. Provide flexible duct connections immediately adjacent to equipment in ducts associated with fans and motorized equipment. Provide at least one inch slack at all flexible duct connections.

G. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, and elsewhere as indicated. Provide minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access, and as indicated.

H. Provide duct test holes where indicated and required for testing and balancing purposes.

**END OF SECTION**

**SECTION 23 36 13 - SERIES FAN-POWERED TERMINAL UNIT**

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Series type fan-powered terminal unit.

1.2 RELATED SECTIONS

A. Section 23 02 00 - Basic Materials And Methods

B. Section 23 05 13 - Common Motor Requirements For HVAC Equipment

C. Section 23 05 48 - Vibration And Seismic Controls For HVAC Piping And Equipment

D. Section 23 05 93 - Testing, Adjusting And Balancing

E. Section 23 31 13 - Metal Ductwork

F. Section 23 31 19 - Ductwork Accessories

1.3 QUALITY ASSURANCE

A. Terminal Units shall be certified under the AHRI Standard 880-98 and carry the AHRI Seal.

B. The terminal units shall be designed, built and tested as a single unit including fan motor and fan assembly, primary air damper assembly, water or electric heating coils and accessories.

C. The entire terminal unit and all electrical components shall be UL listed and installed in accordance with the National Electric Code.

1.4 GENERAL DESCRIPTIONS

A. Furnish, and install fan powered terminal units of the sizes and capacities shown on the plans.

B. Terminal Unit shall ship as a complete assembly requiring no field assembly (including accessories). Terminal unit manufacture shall factory mount EMCS controls, provided by Section 23 09 63 (EMCS contractor).

1.5 SUBMITTALS

A. Submit shop drawings and product data under provisions of Division 01.

B. Shop drawings shall indicate assembly, unit dimensions, weight loading, required clearances, construction details, and field connection details.

C. Product data shall indicate dimensions, weights, capacities, ratings, fan performance, motor electrical characteristics, and gauges and finished of materials.

D. Submit product data or filter media and filter performance data.

E. Submit electrical requirements for power supply wiring including wiring diagrams for interlock and control wiring, clearly indicating factory installed and field installed wiring.

F. Submit manufacturer's installation instructions under provisions of Division 01.

G. Submit operation and maintenance data under provisions of Section 23 02 00.

H. Include instructions for lubrication, filter replacement, motor and drive replacement, spare parts lists, and wiring diagrams.

I. Terminal units shall include a QR code tag to link directly to the specific IOM for the terminal unit to be accessed by mobile device.

1.6 DELIVERY, STORAGE AND HANDLING

A. Unit shall be stored and handled in accordance with the unit manufacturer's instructions.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Do not operate units for any purpose, temporary or permanent, until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

1.8 OPERATIONS PERSONNEL TRAINING

A. Provide a training session for the owner's operations personnel. Training session shall be performed by a qualified person who is knowledgeable in the subject system/equipment. Submit a training agenda two (2) weeks prior to the proposed training session for review and approval. Training session shall include at the minimum:
   1. Purpose of equipment.
   2. Principle of how the equipment works.
   3. Important parts and assemblies.
   4. How the equipment achieves its purpose and necessary operating conditions.
   5. Most likely failure modes, causes and corrections.
   6. On-site demonstration.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Environmental Technologies

B. TITUS

C. KRUEGER

D. NAILOR INDUSTRIES

## 2.2 TERMINAL CASING

A. The terminal casing shall be minimum 20 gauge galvanized steel, internally lined with 1" natural fiber or fiberglass free insulation which complies with UL 181 with regard to resistance to erosion and mold growth and NFPA 90A. Insulation shall have R-values of 4.0. Exposed fiberglass is not acceptable. The insulation shall be mechanically fastened to the unit casing. The fasteners shall be weld pins. Lining material glued in place without mechanical fasteners are not acceptable. Any exposed insulation edges shall be coated with NFPA 90A approved sealant, or covered with galvanized brackets or foil tape. The terminal shall have round duct collars for the primary air connections and a rectangular discharge suitable for flanged duct connection. The casing shall be provided with mounting brackets for hanging from structure.

B. The terminal casing shall have a bottom or side access panel, which allows removal of fan and servicing of terminal without disturbing duct connections.

C. The terminal casing shall have a filter rack/bracket for securing the air filter over the return air inlet. This filter rack shall be sized so that standard sized filters can be installed by the owner as part of ongoing maintenance.

## 2.3 FAN AND FAN MOTOR

A. The fan shall be constructed of steel and have a forward curved dynamically balanced wheel with direct drive motor.

B. The terminal unit shall utilize an ECM variable-speed DC brushless motors specifically designed for use with single phase, 277 volt, 60 hertz electrical input. Motor shall be complete and operated by a single-phase integrated controller/inverter that operates the wound stator and senses rotor position to electronically commutate the stator. All motors shall be designed for synchronous rotation. Rotor shall be permanent magnet type with near zero rotor losses. Motor shall have built-in soft start and soft speed change ramps. Motor shall be able to be mounted with shaft in horizontal or vertical orientation. Motor shall be permanently lubricated with ball bearings. Motor shall be directly coupled to the blower. Motor shall maintain a minimum of 70 percent efficiency over its entire operating range. Provide a motor that is designed to overcome reverse rotation and not affect life expectancy.

C. The terminal unit manufacturer shall provide a factory-installed controller for manual fan cfm adjustment. The manual PWM controller shall be field adjustable with a standard screwdriver. The factory shall preset the fan cfm as shown on the schedule

## 2.4 CONTROL DAMPER

A. Cooling inlet shall have a damper assembly with factory set and calibrated pressure independent control. The damper shall be heavy gauge steel with shaft rotating in Delrin (Polyoxymethylene) self-lubricating bearings. Nylon bearings are not acceptable. Shaft shall be clearly marked on the end to indicate damper position. Stickers or other removable markings are not acceptable. The damper shall incorporate a mechanical stop to prevent over-stroking and a synthetic seal to limit close-off leakage.

B. Damper and casing leakage shall be tested in accordance with ASHRAE Standard 130 and shall not exceed 2% of rated airflow based on a nominal inlet velocity of 2000 FPM at 2.0 IN WG of static pressure.

C. Terminals with interior actuator linkage connection must include gasketed access panel, removable without disturbing ductwork.

2.5 ELECTRIC HEATING COILS

A. Modulating electric coils shall be supplied and installed on the terminal unit by the manufacturer. Coils shall be ETL listed. Coils shall be housed in an attenuator section integral with the terminal with element grid recessed from unit discharge a minimum of 5 inches to prevent damage to elements during shipping and installation. Elements shall be 80/20 nickel chrome, supported by ceramic isolators a maximum of 3½ inches apart, staggered for maximum thermal transfer and element life, and balanced to ensure equal output per step. The integral control panel shall be housed in a NEMA 1 enclosure with a hinged access door for access to all controls and safety devices.

B. Electric coils shall contain a primary automatic reset thermal cutout, a secondary replaceable heat limiter per element, differential pressure airflow switch for proof of flow, and line terminal block. Coil shall include an integral door interlock type disconnect switch, which will not allow the access door to be opened while power is on. Non-interlocking type disconnects are not acceptable. All individual components shall be UL listed or recognized.

C. Heaters shall be equipped with modulating control (Lynergy Comfort Controller (LCC) or equal) to control heater coil firing. The control panel shall include an interface to control heater coil firing in proportion to the EMCS signal. The EMCS signal shall connect to low voltage universal signal interface circuitry supplied and installed by the terminal manufacturer. The universal interface shall be selected for either 0-10 VDC or 0-20 mA interface options, without additional interface circuitry.

D. Discharge air temperature limit shall be provided through the modulating controller incorporating a downstream air temperature sensor. When invoked, the discharge air from the heater shall not exceed an adjustable maximum temperature setpoint.

2.6 FAN INTAKE FILTER

A. The filter shall be 1” thick, disposable construction type mounted in a rack on the fan air inlet and designed for ease of service.

B. Filter size shall be based on standard sizes that are readily available.

2.7 SOUND CRITERIA

A. Sound ratings for the terminals shall not exceed 40 NC in the occupied space at 1.0 inch w.g. inlet static pressure, and discharge static pressure of 0.25 inch w.g. NC estimations shall be calculated per ARI 885-98, Appendix E. The terminal shall be provided with

factory installed internal and external attenuators if sound requirements are not met. The external attenuator shall be shipped internal to the unit to protect it from shipping damage. The external attenuator shall be slid into the operation position and secured without the need for additional screws. Factory provided attenuators that require field installation are not acceptable.

2.8 CONTROLS AND SENSORS

A. The terminal shall mount the pressure independent electronic controls that are provided by Section 23 09 63.

B. The terminal unit shall incorporate a multi-point, center-averaging velocity sensor. A minimum of four measuring ports must be parallel to the takeoff point from the sensor. Sensors with measuring ports in series are not acceptable. The sensor must provide a minimum differential pressure signal of 0.03 IN WG at an inlet velocity of 500 FPM. The sensor must provide airflow control signal accuracy of ± 5%, with a hard 45° or 90° elbow attached directly to the inlet.

C. The terminal unit manufacturer shall provide, mount and wire fan relay, 24-volt transformer, and disconnect switch.

D. Flow measuring taps and flow curves shall be supplied with each terminal for field balancing airflow. Each terminal shall be equipped with labeling showing unit location, size, minimum and maximum cfm setpoints, damper fail position, QR code label as per submittal section, and thermostat action.

E. All electronic accessories, including switches for activation of fan shall be supplied and calibrated by the terminal manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Terminal units shall be installed with all required service clearances, according to manufacturer’s installation instructions.

B. Terminal units with electric heat shall be installed with clearance that meets National Electrical Code requirements.

C. All equipment shall be installed in accordance with the manufacturer's recommendations and printed installation instructions.

D. Space limitation shall be reviewed carefully to ensure that all terminals will fit the available space.

E. All items required for a complete and proper installation are not necessarily indicated on the plans or in the specifications. Provide all items required as per manufacturers requirements.

**END OF SECTION**

**SECTION 23 37 13 - AIR DISTRIBUTION DEVICES**

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Ceiling air diffusers.

B. Wall registers and grilles.

C. Other air devices indicated on drawings and schedules.

1.2 RELATED SECTIONS

A. Section 23 02 00 – Basic Materials and Methods

B. Section 23 05 93 – Testing, Adjusting and Balancing

C. Section 23 31 13 – Metal Ductwork

D. Section 23 31 19 – Ductwork Accessories

1.3 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of air distribution devices of types and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.

B. Codes and Standards:

1. ARI Compliance: Test and rate air distribution devices in accordance with ARI 650 "Standard for Air Outlets and Inlets".
2. ASHRAE Compliance: Test and rate air distribution devices in accordance with ASHRAE 70 "Method of Testing for Rating the Air Flow Performance of Outlets and Inlets".
3. AMCA Compliance: Test and rate louvers in accordance with AMCA 500 "Test Method for Louvers, Dampers and Shutters".
4. AMCA Seal: Provide louvers bearing AMCA Certified Rating Seal.
5. NFPA Compliance: Install air distribution devices in accordance with NFPA 90A "Standard for the Installation of Air Conditioning and Ventilating Systems".

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data for air distribution devices including the following:

1. Schedule of air distribution devices indicating drawing designation, room location, number furnished, model number, size, and accessories furnished.
2. Data sheet for each type of air distribution devices, and accessory furnished; indicating construction, finish, and mounting details.

3. Performance data for each type of air distribution devices furnished, including aspiration ability, temperature and velocity traverses; throw and drop; and noise criteria ratings. Indicate selections on data.

B. Shop Drawings: Submit manufacturer's assembly-type shop drawing for each type of air distribution devices, indicating materials and methods of assembly of components.

C. Maintenance Data: Submit maintenance data, including cleaning instructions for finishes, and spare parts lists. Include this data, product data, and shop drawings in maintenance manuals; in accordance with requirements of Division 1.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver air distribution devices wrapped in factory-fabricated fiber-board type containers. Identify on outside of container type of outlet or inlet and location to be installed. Avoid crushing or bending and prevent dirt and debris from entering and settling in devices.

B. Store air distribution devices in original cartons and protect from weather and construction work traffic. Where possible, store indoors; when necessary to store outdoors, store above grade and enclose with waterproof wrapping.

1.6 WARRANTY

A. Warrant the installation of the Work specified herein for one year against becoming unserviceable or causing an objectionable appearance resulting from defective or nonconforming workmanship.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Titus Company

B. Metalaire Industries, Inc.

C. Nailor Industries

D. Krueger

E. Substitutions under provisions of Division One.

2.2 GENERAL DESCRIPTION

A. Unless otherwise indicated, provide manufacturer’s standard air devices when shown of size, shape, capacity, type and accessories indicated on drawings and schedules, constructed of materials and components as indicated and as required for complete installation and proper air distribution.

B. Provide air devices that have, as minimum, temperature and velocity traverses, throw and drop, and noise criteria ratings for each size device and listed in manufacturer's current data.

C. Unless noted otherwise on drawings, the finish shall be #26 white. The finish shall be an anodic acrylic paint, baked at 315°F for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100 hour ASTM D117 Corrosive Environments Salt Spray Test without creepage, blistering, or deterioration of film. The paint must pass a 250 hour ASTM-870 Water Immersion Test. The paint must also pass the ASTM D-2794 Reverse Impact Cracking Test with a 50 inch pound force applied.

D. Provide air device with border styles that are compatible with adjacent ceiling or wall system, and that are specially manufactured to fit into the wall construction or ceiling module with accurate fit and adequate support. Refer to architectural construction drawings and specifications for types of wall construction and ceiling systems.

E. Provide integral volume damper with roll formed steel blades where indicated on drawings or schedules. Dampers shall be opposed blade design with a screw driver slot or a concealed lever operator for adjustment through the face of the air device.

F. Air devices designated for fire rated systems shall be pre-assembled with UL classified radiation damper and thermal blanket. Fire rated air devices shall be shipped completely assembled; one assembly per carton, each assembly shall be enclosed in plastic shrink wrap with installation instructions.

PART 3 – EXECUTION

3.1 All interior surfaces of all air devices shall be painted flat black.

3.2 Provide insulation on back of all supply air diffusers.

3.3 See floor plans for type, neck size and CFM of air for all air distribution devices.

3.4 Install all air distribution devices as detailed on plans and in accordance with manufacturer's recommendations.

**END OF SECTION**

**SECTION 23 41 00 - AIR FILTERS**

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

B. The Basic Materials and Methods, Section 23 02 00, are included as a part of this Section as though written in full in this document.

1.2 SCOPE

Scope of the Work shall include the furnishing and complete installation of the equipment covered by this Section, with all auxiliaries, ready for owner's use.

PART 2 - PRODUCTS

2.1 FILTERS

A. The filters shall be FARR 30/30 2 inch thick or approved equal.

B. APPROVED MANUFACTURERS: The following manufacturers are approved subject to specification compliance.

1. American Air Filter.
2. Camfil-Farr
3. Kock Filter

2.2 LOW VELOCITY FILTER SECTION

A. Filters shall be of the throwaway cartridge type in 24 inches X 24 inches X 2 inch frames. When installing multiple filters into slide-in frames tape adjacent filters together with duct tape to prevent bypassing of air around the filter. Media shall be rated at 500 feet per minute.

B. Filtering media shall be formed of non-woven reinforced cotton fabric type filtering media bonded to 96% open area media support grid folded into a non-creased radial pleat design. The filter pack shall be bonded to the inclosing frame to prevent air bypass. Average efficiency shall be 25-30% on ASHRAE test standard 52-76. Initial resistance shall not exceed 0.20 inches water gauge at 350 FPM face velocity.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install differential pressure switch to activate "Filter Dirty" light when pressure difference across filters reaches 0.5 inch W.G. (adjustable). Locate "filter dirty" lights in mechanical rooms with identifying label

B. Install and relocate filters in the mechanical or the storage room in accordance with manufacturer's recommendations.

C. Refer to Section 23 02 00 for additional filter information.

**END OF SECTION**

**SECTION 26 02 00 - BASIC MATERIALS AND METHODS**

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all Work herein.

B. The Contract Drawings indicate the extent and general arrangement of the systems. If any departure from the Contract Drawings are deemed necessary by the Contractor, details of such departures and the reasons therefore, shall be submitted to the Architect for approval as soon as practicable. No such departures shall be made without the prior written approval of the Architect.

1.02 SCOPE OF WORK

A. The Work included under this Contract consists of the furnishing and installation of all equipment and material necessary and required to form the complete and functioning systems in all of its various phases, all as shown on the accompanying Drawings and/or described in these Specifications. The contractor shall review all pertinent drawings, including those of other contracts prior to commencement of Work.

B. This Division requires the furnishing and installing of all items Specified herein, indicated on the Drawings or reasonably inferred as necessary for safe and proper operation; including every article, device or accessory (whether or not specifically called for by item) reasonably necessary to facilitate each system's functioning as indicated by the design and the equipment specified. Elements of the work include, but are not limited to, materials, labor, supervision, transportation, storage, equipment, utilities, all required permits, licenses and inspections. All work performed under this Section shall be in accordance with the Project Manual, Drawings and Specifications and is subject to the terms and conditions of the Contract.

C. The approximate locations of Electrical items are indicated on the Drawings. These Drawings are not intended to give complete and accurate details in regard to location of outlets, apparatus, etc. Exact locations are to be determined by actual measurements at the building, and will in all cases be subject to the Review of the Owner or Engineer, who reserves the right to make any reasonable changes in the locations indicated without additional cost to the Owner.

D. Items specifically mentioned in the Specifications but not shown on the Drawings and/or items shown on Drawings but not specifically mentioned in the Specifications shall be installed by the Contractor under the appropriate section of work as if they were both specified and shown.

E. All discrepancies within the Contract Documents discrepancies between the Contract Documents and actual job-site conditions shall be reported to the Owner or Engineer so that they will be resolved prior to the bidding, where this cannot be done at least 7 working days prior to bid; the greater or more costly of the discrepancy shall be bid. All

labor and materials required to perform the work described shall be included as part of this Contract.

F. It is the intention of this Section of the Specifications to outline minimum requirements to furnish the Owner with a turn-key and fully operating system in cooperation with other trades.

G. It is the intent of the above "Scope" to give the Contractor a general outline of the extent of the Work involved; however, it is not intended to include each and every item required for the Work. Anything omitted from the "Scope" but shown on the Drawings, or specified later, or necessary for a complete and functioning heating, ventilating and air conditioning system shall be considered a part of the overall "Scope".

H. The Contractor shall rough-in fixtures and equipment furnished by others from rough-in and placement drawings furnished by others. The Contractor shall make final connection to fixtures and equipment furnished by others.

I. Contractor shall participate in the commissioning process; including but not limited to meeting attendance, completion of checklists and participation in functional testing.

1.03 RELATED SECTIONS

A. General Conditions

B. Supplementary Conditions

C. Division One

1.04 COOPERATION WITH TRADES:

A. Cooperation with trades of adjacent, related, or affected materials or operations shall be considered a part of this work in order to affect timely and accurate placing of work and bring together in proper and correct sequence, the work of such trades.

1.05 REFERENCES

A. National Electrical Code (NEC)

B. American Society for Testing and Materials (ASTM)

C. Underwriter's Laboratories, Inc. (UL)

D. Insulated Cable Engineer's Association (ICEA).

E. National Electrical Manufacturer's Association (NEMA).

F. Institute of Electrical and Electronic's Engineers (IEEE).

G. American National Standards Institute (ANSI).

H. National Fire Protection Association (NFPA).

I. International Energy Conservation Code (IECC).

1.06 COMPLETE FUNCTIONING OF WORK:

A. All work fairly implied as essential to the complete functioning of the electrical systems shown on the Drawings and Specifications shall be completed as part of the work of this Division unless specifically stated otherwise. It is the intention of the Drawings and Specifications to establish the types of the systems, but not set forth each item essential to the functioning of the system. In case of doubt as to the work intended, or in the event of amplification or clarification thereof, the Contractor shall call upon the Architect for supplementary instructions, Drawings, etc.

B. Contractor shall review all pertinent Drawings and adjust his work to all conditions shown there on. Discrepancies between Plans, Specifications, and actual field conditions shall be brought to the prompt attention of the Architect.

1. Approximate location of transformers, feeders, branch circuits, outlets, lighting and power panels, outlets for special systems, etc., are indicated on the Drawings. However, the Drawings, do not give complete and accurate detailed locations of such outlets, conduit runs, etc., and exact locations must be determined by actual field measurement. Such locations will, at all times, be subject to the approval of the Architect.
2. Communicate with the Architect and secure his approval of any outlet (light fixture, receptacle, switch, etc.) location about which there may be the least question. Outlets obviously placed in a location not suitable to the finished room or without specific approval, shall be removed and relocated when so directed by the Architect. Location of light fixtures shall be coordinated with reflected ceiling plans.

C. Additional coordination with mechanical contractor may be required to allow adequate clearances of mechanical equipment, fixtures and associated appurtenances. Contractor to notify Architect and Engineer of unresolved clearances, conflicts or equipment locations.

1.07 SCHEMATIC NATURE OF CONTRACT DOCUMENTS

A. The contract documents are schematic in nature in that they are only to establish scope and a minimum level of quality. They are not to be used as actual working construction drawings. The actual working construction drawings shall be the approved shop drawings.

1.08 CONTRACTOR’S QUALIFICATIONS

A. An approved contractor for the work under this division shall be:

1. A specialist in this field and have the personnel, experience, training, and skill, and the organization to provide a practical working system.

2. Able to furnish evidence of having contracted for and installed not less than 3 systems of comparable size and type that have served their Owners satisfactorily for not less than 3 years.
3. Perform work by persons qualified to produce workmanship of specified quality. Persons performing electrical work shall be required to be licensed. Onsite supervision, journeyman shall have minimum of journeyman license. Helpers, apprentices shall have minimum of apprentice license.

1.09 DATE OF FINAL ACCEPTANCE

A. The date of final acceptance shall be the date of owner occupancy, or the date all punch list items have been completed or final payment has been received. Refer to Division One for additional requirements.

B. The date of final acceptance shall be documented in writing and signed by the architect, owner and contractor.

1.10 DEFINITIONS AND SYMBOLS

A. General Explanation: A substantial amount of construction and Specification language constitutes definitions for terms found in other Contract Documents, including Drawings which must be recognized as diagrammatic and schematic in nature and not completely descriptive of requirements indicated thereon. Certain terms used in Contract Documents are defined generally in this article, unless defined otherwise in Division 1.

B. Definitions and explanations of this Section are not necessarily either complete or exclusive, but are general for work to the extent not stated more explicitly in another provision of the Contract Documents.

C. Indicated: The term "Indicated" is a cross-reference to details, notes or schedules on the Drawings, to other paragraphs or schedules in the Specifications and to similar means of recording requirements in Contract Documents. Where such terms as "Shown", "Noted", "Scheduled", "Specified" and "Detailed" are used in lieu of "Indicated", it is for the purpose of helping the reader locate cross-reference material, and no limitation of location is intended except as specifically shown.

D. Directed: Where not otherwise explained, terms such as "Directed", "Requested", "Accepted", and "Permitted" mean by the Architect or Engineer. However, no such implied meaning will be interpreted to extend the Architect's or Engineer's responsibility into the Contractor's area of construction supervision.

E. Reviewed: Where used in conjunction with the Engineer's response to submittals, requests for information, applications, inquiries, reports and claims by the Contractor the meaning of the term "Reviewed" will be held to limitations of Architect's and Engineer's responsibilities and duties as specified in the General and Supplemental Conditions. In no case will "Reviewed" by Engineer be interpreted as a release of the Contractor from responsibility to fulfill the terms and requirements of the Contract Documents.

F. Furnish: Except as otherwise defined in greater detail, the term "Furnish" is used to mean supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.

G. Install: Except as otherwise defined in greater detail, the term "Install" is used to describe operations at the project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance.

H. Provide: Except as otherwise defined in greater detail, the term "Provide" is used to mean "Furnish and Install", complete and ready for intended use, as applicable in each instance.

I. Installer: Entity (person or firm) engaged by the Contractor or its subcontractor or Sub-contractor for performance of a particular unit of work at the project site, including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protection, cleaning and similar operations, as applicable in each instance. It is a general requirement that such entities (Installers) be expert in the operations they are engaged to perform.

J. Imperative Language: Used generally in Specifications. Except as otherwise indicated, requirements expressed imperatively are to be performed by the Contractor. For clarity of reading at certain locations, contrasting subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or when so noted by other identified installers or entities.

K. Minimum Quality/Quantity: In every instance, the quality level or quantity shown or specified is intended as minimum quality level or quantity of work to be performed or provided. Except as otherwise specifically indicated, the actual work may either comply exactly with that minimum (within specified tolerances), or may exceed that minimum within reasonable tolerance limits. In complying with requirements, indicated or scheduled numeric values are either minimums or maximums as noted or as appropriate for the context of the requirements. Refer instances of uncertainty to Owner or Engineer via a request for information (RFI) for decision before proceeding.

L. Abbreviations and Symbols: The language of Specifications and other Contract Documents including Drawings is of an abbreviated type in certain instances, and implies words and meanings which will be appropriately interpreted. Actual word abbreviations of a self explanatory nature have been included in text of Specifications and Drawings. Specific abbreviations and symbols have been established, principally for lengthy technical terminology and primarily in conjunction with coordination of Specification requirements with notations on Drawings and in Schedules. These are frequently defined in Section at first instance of use or on a Legend and Symbol Drawing. Trade and industry association names and titles of generally recognized industry standards are frequently abbreviated. Singular words will be interpreted as plural and plural words will be interpreted as singular where applicable and where full context of Contract Documents so indicate. Except as otherwise indicated, graphic symbols and abbreviations used on Drawings and in Specifications are those recognized in construction industry for indicated purposes. Where not otherwise noted symbols and abbreviations are defined by

1993 ASHRAE Fundamentals Handbook, chapter 34 "Abbreviations and Symbols", ASME and ASPE published standards.

1.11 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to the project properly identified with names, model numbers, types, grades, compliance labels, and other information needed for identification.

B. Deliver products to the project at such time as the project is ready to receive the equipment, pipe or duct properly protected from incidental damage and weather damage.

C. Damaged equipment shall be promptly removed from the site and new, undamaged equipment shall be installed in its place promptly with no additional charge to the Owner.

1.12 SUBMITTALS

A. Coordinate with Division 01 for submittal timetable requirements, unless noted otherwise within thirty (30) days after the Contract is awarded. The Contractor shall submit an electronic copy of a complete set of shop drawings and complete data covering each item of equipment or material. The submittal of each item requiring a submittal must be received by the Architect or Engineer within the above thirty day period. The Architect or Engineer shall not be responsible for any delays or costs incurred due to excessive shop drawing review time for submittals received after the thirty (30) day time limit. The Architect and Engineer will retain a copy of all shop drawings for their files. All literature pertaining to items subject to Shop Drawing submittal shall be submitted at one time. Submittals shall be placed in one electronic file in PDF 8.0 format and bookmarked for individual specification sections. Individual electronic files of submittals for individual specifications shall not be permitted. Each submittal shall include the following items:

1. A cover sheet with the names and addresses of the Project, Architect, MEP Engineer, General Contractor and the Subcontractor making the submittal. The cover sheet shall also contain the section number covering the item or items submitted and the item nomenclature or description.
2. An index page with a listing of all data included in the Submittal.
3. A list of variations page with a listing all variations, including unfurnished or additional required accessories, items or other features, between the submitted equipment and the specified equipment. If there are no variations, then this page shall state "NO VARIATIONS". Where variations affect the work of other Contractors, then the Contractor shall certify on this page that these variations have been fully coordinated with the affected Contractors and that all expenses associated with the variations will be paid by the submitting Contractor. This page will be signed by the submitting Contractor.
4. Equipment information including manufacturer's name and designation, size, performance and capacity data as applicable. All applicable Listings, Labels, Approvals and Standards shall be clearly indicated.
5. Dimensional data and scaled drawings as applicable to show that the submitted equipment will fit the space available with all required Code and maintenance clearances clearly indicated and labeled at a minimum scale of 1/4" = 1'-0", as required to demonstrate that the alternate or substituted product will fit in the space available.

6. Identification of each item of material or equipment matching that indicated on the Drawings.
7. Sufficient pictorial, descriptive and diagrammatic data on each item to show its conformance with the Drawings and Specifications. Any options or special requirements or accessories shall be so indicated. All applicable information shall be clearly indicated with arrows or another approved method.
8. Additional information as required in other Sections of this Division.
9. Certification by the General Contractor and Subcontractor that the material submitted is in accordance with the Drawings and Specifications, signed and dated in long hand. Submittals that do not comply with the above requirements shall be returned to the Contractor and shall be marked "**REVISE AND RESUBMIT**".

B. Refer to Division 1 for additional information on shop drawings and submittals.

C. Equipment and materials submittals and shop drawings will be reviewed for compliance with design concept only. It will be assumed that the submitting Contractor has verified that all items submitted can be installed in the space allotted. Review of shop drawings and submittals shall not be considered as a verification or guarantee of measurements or building conditions.

D. Where shop drawings and submittals are marked "**REVIEWED**", the review of the submittal does not indicate that submittals have been checked in detail nor does it in any way relieve the Contractor from his responsibility to furnish material and perform work as required by the Contract Documents.

E. Shop drawings shall be reviewed and returned to the Contractor with one of the following categories indicated:

1. **REVIEWED:** Contractor need take no further submittal action, shall include this submittal in the O&M manual and may order the equipment submitted on.
2. **REVIEWED AS NOTED:** Contractor shall submit a letter verifying that required exceptions to the submittal have been received and complied with including additional accessories or coordination action as noted, and shall include this submittal and compliance letter in the O&M manual. The contractor may order the equipment submitted on at the time of the returned submittal providing the Contractor complies with the exceptions noted.
3. **NOT APPROVED:** Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is not approved, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or drawings. Contractor shall not order equipment that is not approved. Repetitive requests for substitutions will not be considered.
4. **REVISE AND RESUBMIT:** Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked revise and resubmit, the Contractor will automatically be required to furnish the product, material or method named in the Specifications and/or provide as noted on previous shop drawings. Contractor shall not order equipment marked revise and resubmit. Repetitive requests for substitutions will not be considered.

5. **CONTRACTOR'S CERTIFICATION REQUIRED:** Contractor shall resubmit submittal on material, equipment or method of installation. The Contractor's stamp is required stating the submittal meets all conditions of the contract documents. The stamp shall be signed by the General Contractor. The submittal will not be reviewed if the stamp is not placed and signed on all shop drawings.
6. **MANUFACTURER NOT AS SPECIFIED:** Contractor shall resubmit new submittal on material, equipment or method of installation when the alternate or substitute is marked manufacturer not as specified, the Contractor will automatically be required to furnish the product, material or method named in the specifications. Contractor shall not order equipment where submittal is marked manufacturer not as specified. Repetitive requests for substitutions will not be considered.

F. Materials and equipment which are purchased or installed without shop drawing review shall be at the risk of the Contractor and the cost for removal and replacement of such materials and equipment and related work which is judged unsatisfactory by the Owner or Engineer for any reason shall be at the expense of the Contractor. The responsible Contractor shall remove the material and equipment noted above and replace with specified equipment or material at his own expense when directed in writing by the Architect or Engineer.

G. Shop Drawing Submittals shall be complete and checked prior to submission to the Engineer for review.

H. Furnish detailed shop drawings, descriptive literature, physical data and a specification critique for each section indicating "compliance" and/or "variations" for the following items:

Heavy Duty Disconnect Switches
Lighting Fixtures
Photocells
Wiring Devices and Plates
Conduit and Fittings
Wire
Sound Reinforcing System
Fire Alarm System

I. Refer to each specification section for additional requirements.

1.13 OPERATION AND MAINTENANCE MANUALS

A. Prepare maintenance manuals in accordance with Division 1 and in addition to the requirements specified in Division 1, include the following information for equipment items:

1. Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of replacement parts.
2. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping,

shutdown, and emergency instructions; and summer and winter operating instructions.

3. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.
4. Servicing instructions and lubrication charts and schedules.

1.14 COORDINATION DRAWINGS

A. Prepare coordination drawings to a scale of 1/4"=1'-0" or larger; detailing major elements, components, and systems of mechanical equipment and materials in relationship with other systems, installations, and building components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the Work, including (but not necessarily limited to) the following:

1. Indicate the proposed locations of pipe, duct, equipment, and other materials. Include the following:
   a. Wall and type locations.
   b. Clearances for installing and maintaining insulation.
   c. Locations of light fixtures and sprinkler heads.
   d. Clearances for servicing and maintaining equipment, including tube removal, filter removal, and space for equipment disassembly required for periodic maintenance.
   e. Equipment connections and support details.
   f. Exterior wall and foundation penetrations.
   g. Routing of storm and sanitary sewer piping.
   h. Fire-rated wall and floor penetrations.
   i. Sizes and location of required concrete pads and bases.
   j. Valve stem movement.
   k. Structural floor, wall and roof opening sizes and details.
2. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.
3. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
4. Prepare reflected ceiling plans to coordinate and integrate installations, air distribution devices, light fixtures, communication systems components, and other ceiling-mounted items.

B. This Contractor shall be responsible for coordination of all items that will affect the installation of the work of this Division. This coordination shall include, but not be limited to: voltage, ampacity, capacity, electrical and piping connections, space requirements, sequence of construction, building requirements and special conditions.

C. By submitting shop drawings on the project, this Contractor is indicating that all necessary coordination has been completed and that the systems, products and equipment submitted can be installed in the building and will operate as specified and intended, in full coordination with all other Contractors and Subcontractors.

1.15 RECORD DRAWINGS

A. Maintain a continuous record during the course of construction of all changes and deviations in the work from the contract drawings. Upon completion of the work, purchase a set of "Auto Positive Tracings" on vellum and make corrections as required to reflect the electrical systems as installed. Location and size of all conduit shall be accurately shown to dimension. Submit three prints of the tracings for approval. Make corrections to tracings as directed and deliver "Auto Positive Tracings" to the Architect. Record drawings shall be furnished in addition to shop drawings. Symbols on the Record drawings shall correspond to the identification symbols on the contract drawings and equipment identification plates and tags.

B. The Contractor shall maintain a set of clearly marked black line record "AS-BUILT" prints on the job site on which he shall mark all work details, alterations to meet site conditions and changes made by "Change Order" notices. These shall be kept available for inspection by the Owner, Architect or Engineer at all times.

C. Refer to Division 1 for additional requirements concerning record drawings. If the Contractor does not keep an accurate set of as-built drawings, the pay request may be altered or delayed at the request of the Architect. Mark the drawings with a colored pencil. Delivery of as-built prints and reproducibles is a condition of final acceptance.

D. The record prints shall be updated on a daily basis and shall indicate accurate dimensions for all buried or concealed work, precise locations of all concealed pipe or duct, locations of all concealed valves, controls and devices and any deviations from the work shown on the Construction Documents which are required for coordination. All dimensions shall include at least two dimensions to permanent structure points.

E. Submit three prints of the tracings for approval. Make corrections to tracings as directed and delivered "Auto Positive Tracings" to the architect. "As-Built" drawings shall be furnished in addition to shop drawings.

F. When the option described in paragraph F., above is not exercised then upon completion of the work, the Contractor shall transfer all marks from the submit a set of clear concise set of reproducible record "AS-BUILT" drawings and shall submit the reproducible drawings with corrections made by a competent draftsman and three (3) sets of black line prints to the Architect or Engineer for review prior to scheduling the final inspection at the completion of the work. The reproducible record "AS-BUILT" drawings shall have the Engineers Name and Seal removed or blanked out and shall be clearly marked and signed on each sheet as follows:

CERTIFIED RECORD DRAWINGS

DATE:

(NAME OF GENERAL CONTRACTOR)

BY:_____
(SIGNATURE)

(NAME OF SUBCONTRACTOR)

BY:_____
(SIGNATURE)

1.16 CERTIFICATIONS AND TEST REPORTS

A. Submit a detailed schedule for completion and testing of each system indicating scheduled dates for completion of system installation and outlining tests to be performed and schedule date for each test. This detailed completion and test schedule shall be submittal at least 90 days before the projected Project completion date.

B. Test result reporting forms shall be submitted for review no later than the date of the detailed schedule submitted.

C. Submit 4 copies of all certifications and test reports to the Architect or Engineer for review adequately in advance of completion of the Work to allow for remedial action as required to correct deficiencies discovered in equipment and systems.

D. Certifications and test reports to be submitted shall include, but not be limited to those items outlined in Section of Division 26.

1.17 MAINTENANCE MANUALS

A. Coordinate with Division 1 for maintenance manual requirements, unless noted otherwise bind together in “D ring type” binders by National model no. 79-883 or equal, binders shall be large enough to allow ¼” of spare capacity. Three (3) sets of all approved shop drawing submittals, fabrication drawings, bulletins, maintenance instructions, operating instructions and parts exploded views and lists for each and every piece of equipment furnished under this Specification. All sections shall be typed and indexed into sections and labeled for easy reference and shall utilize the individual specification section numbers shown in the Electrical Specifications as an organization guideline. Bulletins containing information about equipment that is not installed on the project shall be properly marked up or stripped and reassembled. All pertinent information required by the Owner for proper operation and maintenance of equipment supplied by Division 26 shall be clearly and legibly set forth in memoranda that shall, likewise, be bound with bulletins.

B. Prepare maintenance manuals in accordance with Special Project Conditions, in addition to the requirements specified in Division 26, include the following information for equipment items:

1. Identifying names, name tags designations and locations for all equipment.
2. Fault Current calculations and Coordination Study.
3. Reviewed shop drawing submittals with exceptions noted compliance letter.
4. Fabrication drawings.
5. Equipment and device bulletins and data sheets clearly highlighted to show equipment installed on the project and including performance curves and data as applicable, i.e., description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and model numbers of replacement parts.

6. Manufacturer's printed operating procedures to include start-up, break-in, and routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; and summer and winter operating instructions.
7. Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions, servicing instructions and lubrication charts and schedules.
8. Equipment name plate data.
9. Wiring diagrams.
10. Exploded parts views and parts lists for all equipment and devices.
11. Color coding charts for all painted equipment and conduit.
12. Location and listing of all spare parts and special keys and tools furnished to the Owner.
13. Furnish recommended lubrication schedule for all required lubrication points with listing of type and approximate amount of lubricant required.

C. Refer to Division 1 for additional information on Operating and Maintenance Manuals.

D. Operating and Maintenance Manuals shall be turned over to the Owner or Engineer a minimum of 14 working days prior to the beginning of the operator training period.

1.18 OPERATOR TRAINING

A. The Contractor shall furnish the services of factory trained specialists to instruct the Owner's operating personnel. The Owner's operator training shall include 12 hours of onsite training in three 4 hour shifts.

B. Before proceeding with the instruction of Owner Personnel, prepare a typed outline in triplicate, listing the subjects that will be covered in this instruction, and submit the outline for review by the Owner. At the conclusion of the instruction period obtain the signature of each person being instructed on each copy of the reviewed outline to signify that he has a proper understanding of the operation and maintenance of the systems and resubmit the signed outlines.

C. Refer to other Division 26 Sections for additional Operator Training requirements.

1.19 SITE VISITATION

A. Visit the site of the proposed construction in order to fully understand the facilities, difficulties and restriction attending the execution of the work.

B. Before submitting a bid, it will be necessary for each Contractor whose work is involved to visit the site and ascertain for himself the conditions to be met therein in installing his work and make due provision for same in his bid. It will be assumed that this Contractor in submitting his bid has visited the premises and that his bid covers all work necessary to properly install the equipment shown. Failure on the part of the Contractor to comply with this requirement shall not be considered justification for the omission or faulty installation of any work covered by these Specifications and Drawings.

C. Understand the existing utilities from which services will be supplied; verify locations of utility services, and determine requirements for connections.

D. Determine in advance that equipment and materials proposed for installation fit into the confines indicated.

1.20 WARRANTY

A. The undertaking of the work described in this Division shall be considered equivalent to the issuance, as part of this work, of a specific guarantee extending one year beyond the date of completion of work and acceptance by Owner, against defects in materials and workmanship. Materials, appliances and labor necessary to effect repairs and replacement so as to maintain said work in good functioning order shall be provided as required. Replacements necessitated by normal wear in use or by Owner's abuse are not included under this guarantee.

B. All normal and extended warranties shall include parts, labor, miscellaneous materials, travel time, incidental expenses, freight/shipping, refrigerant, oils, lubricants, belts, filters and any expenses related to service call required to diagnose warranty problems.

1.21 TRANSFER OF ELECTRONIC FILES

A. Project documents are not intended or represented to be suitable for reuse by Architect/Owner or others on extensions of this project or on any other project. Any such reuse or modification without written verification or adaptation by Engineer, as appropriate for the specific purpose intended, will be at Architect/Owner’s risk and without liability or legal exposure to Engineer or its consultants from all claims, damages, losses and expense, including attorney’s fees arising out of or resulting thereof.

B. Because data stored in electric media format can deteriorate or be modified inadvertently, or otherwise without authorization of the data’s creator, the party receiving the electronic files agrees that it will perform acceptance tests or procedures within sixty (60) days of receipt, after which time the receiving party shall be deemed to have accepted the data thus transferred to be acceptable. Any errors detected within the sixty (60) day acceptance period will be corrected by the party delivering the electronic files. Engineer is not responsible for maintaining documents stored in electronic media format after acceptance by the Architect/Owner.

C. When transferring documents in electronic media format, Engineer makes no representations as to the long term compatibility, usability or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by Engineer at the beginning of the Project.

D. Any reuse or modifications will be Contractor’s sole risk and without liability or legal exposure to Architect, Engineer or any consultant.

E. The Texas Board of Architectural Examiners (TBAE) has stated that it is in violation of Texas law for persons other than the Architect of record to revise the Architectural drawings without the Architect's written consent.

It is agreed that "MEP" hard copy or computer-generated documents will not be issued to any other party except directly to the Architect/Owner. The contract documents are contractually copyrighted and cannot be used for any other project or purpose except as specifically indicated in AIA B-141 Standard Form of Agreement Between Architect and Owner.

If the client, Architect/Owner, or developer of the project requires electronic media for "record purposes", then an AutoCAD based compact disc ("CD") will be prepared. The "CD" will be submitted with all title block references intact and will be formatted in a "plot" format to permit the end user to only view and plot the drawings. Revisions will not be permitted in this configuration.

F. At the Architect/Owner's request, Engineer will prepare one "CD" of electronic media to assist the contractor in the preparation of submittals. The Engineer will prepare and submit the "CD" to the Architect/Owner for distribution to the contractor. All copies of the "CD" will be reproduced for a cost of reproduction fee of Five Hundred Dollars ($500.00) per "CD".

The "CD" will be prepared and all title blocks, names and dates will be removed. The "CD" will be prepared in a ".dwg" format to permit the end user to revise the drawings.

G. This Five Hundred Dollars ($500.00) per "CD" cost of reproduction will be paid directly from the Contractor to the Engineer. The "CD" will be prepared only after receipt of the Five Hundred Dollars ($500.00). The Five Hundred Dollars ($500.00) per "CD" cost of reproduction is to only recover the cost of the manhours necessary to reproduce the documents. It is not a contractual agreement between the Contractor and Engineer to provide any engineering services, nor any other service.

## PART 2 - PRODUCTS

### 2.01 SUBSTITUTIONS

A. The names and manufacturers and model numbers have been used in the Contract documents to establish types of equipment and standards of quality. Where more than one manufacturer is named for a specific item of equipment, only one of the specified manufacturers will be considered for approval. Where only one manufacturer is mentioned with the phrase "or approved equal", Contractor may submit an alternate manufacturer for consideration, provided the following conditions are met:

1. Submit alternate equipment with complete descriptive data in shop drawing form. Provide sample of equipment upon request for review by Architect. Samples will be returned if requested in writing.
2. Alternate equipment must be equal from the standpoint of materials, construction and performance.
3. Alternate submittal must be presented to the Engineer/Architect ten (10) days prior to bid date for approval.

B. The Architect and Engineer shall be the sole judge of quality and equivalence of equipment, materials and methods.

2.02 All materials and products used on this project shall be listed by Underwriters' Laboratories.

2.03 ACCESS DOORS

A. Wherever access is required in walls or ceilings to concealed junction boxes, pull boxes, equipment, etc., installed under this Division, furnish a hinged access door and frame with flush latch handle to another Division for installation. Doors shall be as follows:

1. Plaster Surfaces: Milcor Style K.
2. Ceramic Tile Surfaces: Milcor Style M.
3. Drywall Surfaces: Milcor Style DW.
4. Install panels only in locations approved by the Architect.

2.04 EQUIPMENT PADS

A. Provide 4-inch-high concrete pads for indoor floor mounted equipment. Pads shall conform to the shape of the equipment with a minimum of 6 inch beyond the equipment. Top and sides of pads shall be troweled to a smooth finish, equivalent to the floor. External corners shall be bullnosed to a 3/4" radius, unless shown otherwise.

B. Provide 6-inch-high concrete pads for all exterior mounted equipment. Pads shall conform to the shape of the equipment with a minimum of 6 inch beyond the equipment. Provide a 4-foot monolithic extension to the pad in front of the equipment for service when mounted on a non-finished area (i.e. landscape, gravel, clay, etc.) Top and sides of pads shall be troweled to a smooth finish. External corners shall be bullnosed to a 3/4" radius, unless shown otherwise.

C. Provide a minimum 6-inch-high, steel reinforced concrete pad for generators. Pads shall be sized 6” larger that the outside perimeter dimensions. Provide a 4-foot monolithic extension to the pad around the equipment for service when mounted on a non-finished area (i.e. landscape, gravel, clay, etc.). Refer to structural details. Top and sides of pads shall be troweled to a smooth finish. External corners shall be bullnosed to a 3/4" radius, unless shown otherwise. The generator shall be bolted to the concrete pad per the manufacturers details.

D. Provide steel reinforced concrete pad for utility transformers. Pads shall comply with Utility Company Standards.

2.05 ESCUTCHEONS

A. Provide heavy chrome or nickel plated plates, of approved pattern, on conduit passing through walls, floors and ceilings in finished areas. Where conduit passes through a sleeve, no point of the conduit shall touch the building construction. Caulk around such conduit with sufficient layers of two hour rated firesafing by Thermafiber 4.0 P.C.F.

density, U.S.G. fire test 4/11/78 and seal off openings between conduit and sleeves with non-hardening mastic prior to application of escutcheon plate. Escutcheons shall be Gravler Sure-Lock, or approved equal.

2.06 SPACE LIMITATIONS

A. Equipment shall be chosen which shall properly fit into the physical space provided and shown on the drawings, allowing ample room for access, servicing, removal and replacement of parts, etc. Adequate space shall be allowed for clearances in accordance with Code requirements. Physical dimensions and arrangement of equipment shall be subject to the approval of the Architect.

2.07 PAINTING

A. All factory assembled equipment for electrical work, except light fixtures, that normally is delivered with a factory applied finish shall be delivered with a hard surface factory applied finish such as baked-on machinery enamel which will not require additional field painting. The finish shall consist of not less than 2 coats of medium gray color paint USA No. 61 Munsell Notation 8-3G, 6. 10/0.54 enamel. This Contractor shall protect this finish from damage due to construction operations until acceptance of the building. He shall be responsible for satisfactorily restoring any such finishes or replacing equipment that becomes stained or damaged.

2.08 ELECTRICAL SYSTEM IDENTIFICATION

A. Conduit Systems: Provide adequate marking of major conduit which is exposed or concealed in accessible spaces to distinguish each run as either a power or signal/communication conduit. Except as otherwise indicated, use orange banding with black lettering. Provide self-adhesive or snap-on type plastic markers. Indicate voltage for that raceway. Locate markers at ends of conduit runs, on pull boxes, on junction boxes, near switches and other control devices, near items of equipment served by the conductors, at points where conduit passes through walls or floors, or enters non-accessible construction and at spacings of not more than 50 feet along each run of conduit. Switch-leg conduit and short branches for power connections do not have to be marked, except where conduit is larger than ¾ inch. Branch circuit conduits, junction boxes and pull boxes shall be marked with a permanent marker indicating panel name and branch circuit numbers.

B. Underground Cable Identification: Bury a continuous, preprinted, bright colored plastic ribbon cable marker with each underground cable (or group of cables), regardless of whether conductors are in conduit, duct bank, or direct buried. Locate each directly over cables, 6 to 8 inches below finished grade.

C. Identification of Equipment:

1. All major equipment shall have a manufacturer’s label identifying the manufacturer’s address, equipment model and serial numbers, equipment size, and other pertinent data. Care shall be taken not to obliterate this nameplate in any way.
2. A black-white-black laminated plastic engraved identifying nameplate shall be

secured by stainless steel screws to each automatic transfer switch, switchboard, distribution panel, motor control center, motor starter panels and panelboards.

a. Identifying nameplates shall have ¼ inch high engraved letters and shall contain the following information:
   1) Name
   2) Voltage
   3) Phase
   4) "3" or "4" wire, and
   5) Where it is fed from.

b. An example of a panelboard nameplate is:
   Center Panel – 1HB
   480/277 volt, 3 phase, 4 wire
   Center Fed from DP2

c. An example of an automatic transfer switch nameplate is:
   Center ATS #2
   480/277 volt, 3 phase, 4 wire, 4 pole
   Center Fed from MSB and DPE

3. Each feeder device in a switchboard, distribution panel, and motor control center device shall have a nameplate showing the load served in ½ inch high engraved letters.

4. A black-white-black laminated plastic engraved identifying nameplate shall be secured by screws to each safety switch, disconnect switch, individual motor starter, enclosed circuit breaker, wireway, and terminal cabinet.
   a. Identifying nameplates shall have ¼ inch high engraved letters and shall indicate the equipment served.
   b. An example if a disconnect switch is: AHU-1.

5. Cardholders and directory cards shall be furnished for circuit identification in panelboards. Cardholder shall be located on inside of panel door and shall be in a metal frame with clear plastic front. Circuit lists shall be typewritten. Circuit descriptions shall include location and name of each item of equipment served. Spares and spaces shall be written in erasable pencil for future use. Circuit directory shall show the room served by each circuit. The final graphs/signage room numbers shall be used. Do not use Architectural numbering on plans.

6. Prohibited Markings: Markings which are intended to identify the manufacturer, vendor, or other source from which the material has been obtained are prohibited for installation within public, tenant, or common areas within the project. Also, prohibited are materials or devices which bear evidence that markings or insignias have been removed. Certification, testing (example, Underwriters' Laboratories, Inc.), and approval labels are exceptions to this requirement.

7. Warning Signs: Provide warning signs where there is hazardous exposure associated with access to or operation of electrical facilities. Provide text of sufficient clarity and lettering of sufficient size to convey adequate information at each location; mount permanently in an appropriate and effective location. Comply with recognized industry standards for color and design.

8. Operational Tags: Where needed for proper and adequate information on operation and maintenance of electrical system, provide tags of plasticized card stock, either preprinted or hand printed. Tags shall convey the message, example: "DO NOT OPEN THIS SWITCH WHEN BURNER IS OPERATING."

PART 3 - EXECUTION

3.01 EXCAVATING AND BACKFILLING

A. Trenching and backfilling and other earthwork operations required to install the facilities specified herein shall conform to the applicable requirements of Division 2 (95% of maximum standard density). Where trenching or excavation is required in improved areas, the backfill shall be compacted to a condition equal to that of adjacent undisturbed earth and the surface of the area restored to the condition existing prior to trenching or excavating operations. Provide a minimum of 3" of sand underneath all conduits. The plans indicate information pertaining to surface and sub-surface obstructions; however, this information is not guaranteed. Should obstructions be encountered whether or not shown, the Contractor shall alter routing of new work, reroute existing lines, remove obstructions where permitted, or otherwise perform whatever work is necessary to satisfy the purpose of new work and leave existing surfaces and structures in a satisfactory and serviceable condition. **All work shall comply with OSHA Standards.**

3.02 WORKMANSHIP AND CONCEALMENT

A. The work of this Section shall be performed by workman skilled in their trade. Installation shall be consistent in completeness whether concealed or exposed. Each item of electrical work shall be concealed in walls, chases, under floors and above ceilings except:

1. Where shown to be exposed.
2. Where exposure is necessary to the proper function.

3.03 SLEEVES, CUTTING AND PATCHING

A. This section shall be responsible for placing sleeves for all conduit passing through walls, partitions, sound walls, beams, floors, roof, etc. Sleeves through below-grade walls shall use water-tight fitting manufactured by O-Z/Gedney.

B. All cutting and patching will be done under another Division, but this Section will be responsible for timely performance of this work and layout of holes and setting sleeves.

C. All un-used sleeves shall be sealed with 2 hour UL approved fire sealant manufactured by "3M" or approved equal.

D. Refer to 26 05 33 for additional requirements.

3.04 ELECTRICAL GEAR

A. Install all electrical equipment in accordance with the National Electrical Code and as shown on the drawings.

B. Lighting contractors, time clocks, disconnect switches, etc. mounted in mechanical/electrical rooms shall be mounted at a working height not requiring a ladder, when wall space is available. Installation of these devices at greater elevations shall be approved by the Engineer. Contractor shall provide a coordination sketch of each

mechanical/electrical room noting locations and mounting heights of all electrical devices(note bottom and top elevations) shown to be installed. Sketches shall be provided to the Engineer for review and the general contractor for coordination with other trades working in these rooms.

3.05 CLEANING

A. Clean lighting fixtures and equipment.

B. Touch-up and refinish scratches and marred surfaces on panels, switches, starters, and transformers.

3.06 CORROSIVE AREAS

A. In areas of a corrosive nature, which include but are not limited to the following: pool equipment rooms, cooling towers and areas subject to salt air, etc., provide NEMA 4 X stainless steel or fiberglass reinforced enclosures for contactors, panel boards, controllers, starters, disconnects and materials used as supporting means (i.e. plastibond unistrut, pipe, fittings). The use of spray on coating may be acceptable in some applications.

3.07 TESTS AND INSPECTIONS

A. Tests and inspection requirements shall be coordinated with Division I.

B. Date for final acceptance test shall be sufficiently in advance of completion date of contract to permit alterations or adjustments necessary to achieve proper functioning of equipment prior to contract completion date.

C. Conduct re-tests as directed by Architect on portions of work or equipment altered or adjusted as determined to be necessary by final acceptance test. No resultant delay or consumption of time as a result of such necessary re-test beyond contract completion date shall relieve Contractor of his responsibility under contract.

D. Put circuits and equipment into service under normal conditions, collectively and separately, as may be required to determine satisfactory operation. Demonstrate equipment to operate in accordance with requirements of these specifications. Perform tests in the presence of Architect. Furnish instruments and personnel required for tests.

E. Final Inspection:

1. At the time designated by the Architect, the entire system shall be inspected by the Architect and Engineer. The contractor or his representative shall be present at this inspection.
2. Panelboards, switches, fixtures, etc., shall be cleaned and in operating condition.
3. Certificates and documents required hereinbefore shall be in order and presented to the Architect prior to inspection.
4. Panel covers, junction box covers, etc., shall be removed for visual inspection of the wire, bus bars, etc.

5. After the inspection, any items which are noted as needing to be changed or corrected in order to comply with these specifications and the drawings shall be accomplished without delay.

F. The contractor shall provide a thermographic test using an independent testing laboratory using an infrared scanning device. This test shall include but not limited to all switchboards, distribution panelboards, panelboards, automatic transfer switches and other electrical distribution devices. This test shall be conducted to locate high temperature levels. This test shall be conducted between 3 to 8 months after occupancy, but not beyond the one year warranty period. Submit test to the architect and engineer using test reporting forms. All unacceptable conditions shall be corrected prior to the end of the warranty period.

**END OF SECTION**

# SECTION 26 03 13 - ELECTRICAL DEMOLITION FOR REMODELING

## PART 1 – GENERAL

### 1.01 SECTION INCLUDES

A. Electrical demolition.

B. The contractor shall be responsible for loss or damage to the existing facilities caused by him and his workmen, and shall be responsible for repairing such loss or damage. The contractor shall send proper notices, make necessary arrangements, and perform other services required for the care, protection and in-service maintenance of all electrical services for the new and existing facilities. The contractor shall erect temporary barricades, with necessary safety devices, as required to protect personnel from injury, removing all such temporary protection upon completion of the work.

C. Outages of services as required by the new installation will be permitted but only at a time approved by the Owner. The contractor shall allow the Owner 2 weeks in order to schedule required outages. The time allowed for outages will not be during normal working hours unless otherwise approved by the Owner. All costs of outages, including overtime charges, shall be included in the contract amount.

D. The contractor shall provide temporary or new services to all existing facilities as required to maintain their proper operation when normal services are disrupted as a result of the work being accomplished under this project.

### 1.02 RELATED SECTIONS

A. Section 01120 – Alteration Project Procedures.

B. Section 02072 – Minor Demolition for Remodeling.

## PART 2 – PRODUCTS

### 2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: As specified in individual Sections.

B. Include in the contract price all rerouting of existing conduits, wiring, outlet boxes, fixtures, etc., and the reconnecting of existing fixtures as necessitated by field conditions to allow the installation of the new systems. Furnish all temporary conduit, wiring, boxes, etc., as required to maintain lighting and power service for the existing areas with a minimum of interruption. Remove wire and conduit back to nearest accessible active junction box and extend to existing homeruns as required.

## PART 3 – EXECUTION

### 3.01 EXAMINATION

A. Verify field measurements and circuiting arrangements are as shown on Drawings.

B. Verify that abandoned wiring and equipment serve only abandoned facilities.

C. Demolition Drawings are based on casual field observation and existing record documents. Report discrepancies to Owner before disturbing existing installation.

D. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.

B. Coordinate utility service outages with Utility Company.

C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits use personnel experienced in such operations.

D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from Owner at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

E. Existing Fire Alarm System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Notify Owner and local fire service at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

F. Existing Telephone System: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Notify Owner and Telephone Utility Company at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

G. Existing Public Address System: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Obtain permission from the Owner and at least 24 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

A. Demolish and extend existing electrical work under provisions of Section 01120, Section 02072, and this Section.

B. Remove, relocate, and extend existing installations to accommodate new construction.

C. Remove abandoned wiring to source of supply.

D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.

E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets, which are not removed.

F. Disconnect and remove abandoned panelboards and distribution equipment.

G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.

H. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.

I. Repair adjacent construction and finishes damaged during demolition and extension work.

J. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.

K. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

L. Where existing construction is removed to provide working and extension access to existing utilities, contractor shall remove doors, piping, conduit, outlet boxes, wiring, light fixtures, air conditioning ductwork and equipment, etc., to provide this access and shall reinstall same upon completion of work in the areas affected.

M. Where partitions, walls, floors, or ceilings of existing construction are being removed, all contractors shall remove and reinstall in locations approved by the Architect all devices required for the operation of the various systems installed in the existing construction.

N. During the construction and remodeling, portions of the project shall remain in service. Construction equipment, materials, tools, extension cords, etc., shall be arranged so as to present minimum hazard or interruption to the occupants of the building.

O. Certain work during the demolition phase of construction may require overtime or nighttime shifts or temporary evacuation of the occupants. Coordinate and schedule all proposed down time with the Owner's Representative at least 72 hours in advance.

P. All existing lighting fixtures, switches, outlets, speakers, materials, equipment and appurtenances not included in the remodel or alteration areas are to remain in place and shall remain in service.

Q. Electrical equipment, outlets, speakers, circuits to mechanical and building systems equipment, etc., which are to remain but which are served by conduit and/or circuiting that is disturbed by the remodeling work, shall be reconnected in such as manner as to leave it in proper operating condition.

R. Existing branch circuit wiring which is to be removed, shall be pulled from the raceways and the empty conduit shall be removed to a point of permanent concealment.

S. Within the remodeled or alteration areas where existing walls are being removed, all existing lighting fixtures, switches, receptacles, other materials and equipment and their appurtenances shall be removed, where required by the remodel work either shown or specified.

T. New circuiting indicated to be connected to existing panels shall be connected to "spares" and/or "released" breakers as applicable, or new breakers provided where space is available. Contractor shall verify the existing panel load and feeder capacity prior to adding any additional loads.

U. In all the remodeled areas where existing ceilings are being removed and reinstalled, all existing lighting fixtures, other ceiling mounted devices (i.e. smoked detectors, speakers, etc.) and their appurtenances shall be removed and reinstalled, unless otherwise shown or specified. This also applies to new ceiling installations.

V. Existing lighting fixtures shown to be removed and indicated to be reused, shall be cleaned, repaired, and provided with new accessories as required for the proper operation in their new locations. Provide new lamps and ballast as required.

## 3.04 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment which remain or are to be reused.

B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

## 3.05 INSTALLATION

A. Install relocated materials and equipment under the provisions of Section 01120.

## 3.06 REMOVAL OF MATERIALS

A. The contractor shall modify, remove, and/or relocate all materials and items so indicated on the drawings or required by the installation of new facilities. All removals and/or dismantling shall be conducted in a manner as to produce maximum salvage. Salvage materials shall remain the property of the Owner, and shall be delivered to such destination as directed by the Owner. Materials and/or items scheduled for relocation and which are damaged during dismantling or reassembly operations shall be repaired and restored to good operative condition. The contractor may, at his discretion and upon the approval of the Owner, substitute new materials and/or items of like design and quality in lieu of materials and/or items to be relocated.

B. All items which are to be relocated shall be carefully removed in reverse to original assembly or placement and protected until relocated. The contractor shall clean, repair, and provide all new materials, fittings, and appurtenances required to complete the relocations and to restore to good operative order. All relocations shall be performed by

workmen skilled in the work and in accordance with standard practice of the trades involved.

C. When items scheduled for relocation are found to be in damaged condition before work has been started on dismantling, the contractor shall call the attention of the Owner to such items and receive further instructions before removal. Items damaged in repositioning operations are the contractor's responsibility and shall be repaired or replaced by the contractor as approved by the Owner, at no additional cost to the Owner.

D. Service lines and wiring to items to be removed, salvaged, or relocated shall be removed to points indicated on the drawings, specified, or acceptable to the Owner. Service lines and wiring not scheduled for reuse shall be removed to the points at which reuse is to be continued or service is to remain. Such services shall be sealed, capped, or otherwise tied-off or disconnected in a safe manner acceptable to the Owner. All disconnections or connections into the existing facilities shall be done in such a manner as to result in minimum interruption of services to adjacent occupied areas. Services to existing areas or facilities which must remain in operation during the construction period shall not be interrupted without prior specific approval of the Owner as hereinbefore specified.

**END OF SECTION**

## SECTION 26 05 19 - WIRE, CABLE AND RELATED MATERIALS

PART 1 - GENERAL

1.01 SCOPE

A. Provide 600 volt building wire, cable and connectors and 300 volt wire, cable and connectors.

B. WORK INCLUDED: Include the following Work in addition to items normally part of this Section.

1. Wiring for lighting and power.
2. Automatic Control Wiring.
3. Connection of equipment shown.

C. WORK SPECIFIED ELSEWHERE:

1. Heating, ventilating, and air conditioning equipment.
2. Structured cabling system.
3. Coaxial cables

1.02 STANDARDS

A. UL83

B. ASTM B-3

C. All wire cable and connectors shall be UL approved.

1.03 ACCEPTABLE MANUFACTURERS

A. 600 VOLT WIRE AND CABLE

1. Southwire
2. Encore
3. Cerro

B. 300 VOLT WIRE AND CABLE

1. Westpenn
2. Beldon
3. Alpha
4. Tappan - Southwire

C. FLEXIBLE CABLE SYSTEMS

1. AFC Modular Cable Systems

D. CONNECTORS

1. Ilsco
2. Cooper
3. AMP - TYCO
4. Burndy
5. Ideal
6. 3M
7. O.Z. Gedney
8. Thomas & Betts
9. Buchanan

1.04 SUBMITTALS

A. Shop drawings shall include, but not limited to:

1. Cutsheets of wire, cable and connectors to indicate the performance, fabrication procedures, product variations, and accessories.

1.05 REQUIREMENTS OF REGULATORY AGENCIES WORK IN ACCORDANCE WITH:

A. National Electrical Code.

B. Local, municipal, or state codes that have jurisdiction.

PART 2 - PRODUCTS

2.01 WIRING

A. All wire shall be new and continuous without weld, splice, or joints throughout its length. It must be uniform in cross-section, free from flaws, scales and other imperfections.

B. WIRE MATERIAL: Conductors shall be soft drawn, annealed copper. Aluminum wiring is not acceptable unless otherwise noted on drawings.

C. TYPES:

"THHN/THWN-2"

1. Provide type "THHN/THWN-2"insulation for all buried feeders and service entrance conductors.
2. Provide type "THHN/THWN-2" insulation for all branch circuits and above grade feeders.
3. All wire No. 8 and larger shall be stranded. All wire No. 10 and smaller shall be stranded or solid.
4. Provide type "XHHW" or other 90 degrees insulation wiring for branch circuit wiring installed through continuous rows of fluorescent fixture bodies.
5. All 300-volt cable including but not limited to telephone, fire alarm, data, CATV and security shall be UL listed for use in return air plenums.

D. CONDUCTOR SIZES

1. Feeder conductors shall be sized for a maximum of 2% drop in rated voltage at scheduled load.
2. Branch circuit conductors shall be sized for a maximum 3% drop in the rated voltage to the longest outlet on the circuit.
3. Minimum wire shall be No. 12, unless otherwise shown on Drawings or required by Code.

E. COLOR CODING: No. 6 or larger shall use tape for color coding. No. 8 and smaller wire shall be color coded in accordance with the governing authority requirements or as follows:

| 120/208 Volt | 277/480 Volt | 120/240 Volt |
|---|---|---|
| Neutral: White | Neutral: Gray | Neutral: White |
| Phase A: Black | Phase A: Brown | Phase A: Black |
| Phase B: Red | Phase B: Purple | Phase B: Orange |
| Phase C: Blue | Phase C: Yellow | Phase C: Blue |
| Ground: Green | Ground: Green | Ground: Green |

[SAN ANTONIO ONLY]
277/480 VOLT
Neutral: Gray
Phase A: Purple
Phase B: Brown
Phase C: Yellow
Ground: Green

2.02 GROUNDING

Permanently connect all conduit work, motors, starters, and other electrical equipment to grounding system in accordance with the National Electrical Code.

PART 3 - EXECUTION

3.01 WIRE

A. Do not pull wire into conduit until Work of an injurious nature is completed. Where two or more circuits run to a single outlet box, each circuit shall be properly tagged. Wyreze or approved equal may be used as a lubricant where necessary.

B. Splices shall be fully made up in outlet boxes with compression crimp-on type splice connectors.

C. Joints and splices will not be permitted in service entrance or in feeders. Joints in branch circuits will be permitted where branch circuits divide, and then shall consist of one through-circuit to which the branch shall be spliced. Joints shall not be left for the fixture hanger to make. Connect joints and splices with Buchanan Series "2000" solderless connectors complete with insulating caps or properly sized twist on wire nuts. “Wago” push-in connectors are not acceptable.

D. All stranded conductors shall be furnished with lugs or connectors.

E. Connectors furnished with circuit breakers or switches shall be suitable for copper wire termination.

F. "Sta-Cons" shall be used to terminate stranded conductors on all switches and receptacles.

G. All stranded #10 and small conductors shall be terminated with an approved solderless terminal if the device or light fixture does not have provisions for clamp type securing of the conductor.

H. The jacket for all travelers used on 3-way and 4-way switches shall be pink.

3.02 BALANCING SYSTEM

The load on each distribution and lighting panel shall be balanced to within 10% by proper arrangement of branch circuits on the different phase legs. Provide written documentation showing results. Submit with O & M manuals.

3.03 LOW VOLTAGE WIRING

A. Low voltage wiring shall be plenum rated. All wiring in mechanical rooms, electrical rooms, drywall ceiling, inaccessible areas, underground, plaster ceiling, inside concealed walls areas exposed to occupant view, and other areas subject to physical damage shall be run in conduit.

B. Low voltage wiring shall be routed in separate raceways from power wiring systems.

C. Sleeves shall be placed in the forms of concrete, masonry and fire rated walls, floor slabs and beams, for the passage of wiring. Sleeves should be set in place a sufficient time ahead of the concrete work so as not to delay the work. Sleeves shall be rigid galvanized steel.

D. Provide Caddy J-hooks supported independently from other system to support cable at 4-foot on center or closer if required by manufacture.

3.04 CABLE SUPPORTS

A. Provide cable supports in all vertical raceways in accordance with Article 300-19 of the NEC.

3.05 DEFECTS

A. Defects shall include, but are not to limited to, the following:

1. Tripping circuit breakers under normal operation.
2. Improperly connected equipment.
3. Damaged, torn, or skinned insulation.

**END OF SECTION**

**SECTION 26 05 26 - GROUNDING**

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. The requirements of the General Conditions and Supplementary Conditions apply to all work herein.

1.02 SCOPE

A. WORK COMBINED WITH OTHER SECTIONS: Combine the work specified herein with the following Sections to form a single responsibility for the Work:

1. Electrical.
2. Basic materials and methods.

B. Provide electrical service, equipment and wiring device grounding as shown, scheduled and as specified.

C. The types of grounding include, but not limited to, the grounding bonding of all equipment devices, building steel piping, and as required by the National Electrical Code, Local Inspection Department and Power Company.

1.03 STANDARDS

A. NATIONAL ELECTRICAL CODE (NFPA-70)

B. Local municipal and State codes that have jurisdiction.

C. NECA

1.04 ACCEPTABLE MANUFACTURES

A. Provide grounding products manufactured by Copperweld and Cadweld.

1.05 SUBMITTALS

A. Shop drawings shall include, but not limited to the following:

1. Cut sheets of ground rods, clamps and connectors.
2. Grounding system diagram.

PART 2 - PRODUCTS

A. GENERAL: Provide all materials required to construct a complete grounded electrical system.

B. GROUND RODS: Ground rods shall be 3/4" inch diameter by 10 feet long construction with copper jacket and a steel core.

C. CLAMPS: Ground clamps shall be copper except for steel or iron pipes in which the clamps shall be galvanized iron.

D. CONDUCTORS: Conductors shall be connected by means of an approved pressure connector or clamp.

PART 3 - EXECUTION

3.01 INSTALLATION

A. GENERAL: Install grounding system as shown and specified to ensure a properly grounded system.

B. SERVICE ENTRANCE GROUNDING SYSTEM: Provide a main bonding jumper between the neutral and ground bus of each switchboard. Route a separate grounding electrode conductor in conduit from each [main distribution panel] [main gutter] [switchboard] to the ground rod grid, incoming cold water piping system, [and to the "lightning protection system" (250 - 106 of NEC) under ground bonding loop]. Provide a bonding jumper around water meter. The grounding electrode conductor shall be stranded copper, 98% conductivity and shall be run continuous without splices or joints and installed at least 12" below grade.

C. BUILDING STEEL AND PIPING SYSTEM: Install a bonding jumper between building steel and metallic piping systems to bond them to the electrical grounding system.

D. NEUTRAL: The neutral shall be grounded only at the service entrance and other separately derived systems. The neutral shall be kept separate from the grounding system and shall not be used as a ground.

E. GROUNDING SEPARATELY DERIVED ALTERNATING CURRENT SYSTEM

1. TRANSFORMERS: The center point (neutral) of each wye connected transformer shall be bonded to the case and a grounding electrode conductor shall be connected to a ground rod or building steel.
2. STANDBY EMERGENCY GENERATOR: The generator neutral shall be bonded to the generator when a 4 pole switched neutral automatic transfer switch is specified.

F. GROUNDING CONDUCTOR: A grounding conductor and metallic conduit system shall bond all equipment served by the electrical system. Provide a flexible bonding jumper for isolated metallic piping and ductwork and around expansion fittings and joints.

G. CONDUIT GROUNDING BUSHING:

Conduit terminating in equipment that has a ground bus such as switchboards, panelboards, etc., shall have grounding bushings installed. Ground each conduit by means of a grounding bushing and to the ground bus in the equipment.

H. MOTORS: The frame of all motors shall be grounded.

I. SPECIAL GROUNDING: Provide a #6 AWG copper grounding conductor for each telephone board, television system, etc. Terminate the grounding conductor on ground bus and to the building electrical grounding system. Refer to 800-40(d) and 820-40(d) of the NEC.

J. REMOTE PANELBOARDS: Provide a grounding electrode conductor all remote panels as required by the NEC and shown on drawings.

K. LIGHTING FIXTURES: Flexible fixture whips containing a green grounding conductor shall be used to connect light fixtures. Flexible fixture whips shall not exceed ten feet.

L. RECEPTACLES: All receptacles shall be grounded using the branch circuit grounding conductor. Receptacles shall use an approved grounding yoke.

3.02 TESTING: Perform a ground resistance test using a biddle analog or digital portable earth/ground resistance tester. The system resistance shall not exceed 5 OHMS. Provide additional electrodes as required (refer to 250-84 of the NEC or the most current edition 250-56). Test shall not be conducted following wet weather. Provide personal instruments to conduct these tests and submit certified test for review. Test shall be verified by Engineer.

**END OF SECTION**

**SECTION 26 05 33 - RACEWAYS**

PART 1 - GENERAL

1.01 SCOPE

A. Provide electrical raceways and fittings as shown, scheduled and specified.

B. The types of raceways and fittings required are as follows:

1. Rigid hot-dipped galvanized steel conduit (GRC) (RMC)
2. Intermediate hot-dipped galvanized steel conduit (IMC)
3. Electrical metallic tubing (EMT)
4. PVC (Sch. 40 & 80)
5. Flexible metal conduit (FMC)
6. Liquid-tight flexible metal conduit (LFMC)
7. PVC coated rigid galvanized steel conduit

1.02 STANDARDS

A. ANSI, C80.1 & C80.3

B. NEMA FB-1

C. NEMA TC3

D. UL, 6, 797 & 1242

1.03 ACCEPTABLE MANUFACTURERS

A. Raceways

1. Allied
3. Republic
2. Prime Conduit (Carlon)
3. Wheatland Tube
4. Cantex
5. Western Tube
6. Robroy Industries

B. Fittings

1. Appleton
2. Crouse Hinds
3. Steel City
4. O.Z. Gedney
5. Carlon
6. Raco, Inc.
7. Bridgeport

C. Boxes

1. RACO
2. Thomas and Betts
3. EATON
4. Crouse-Hinds
5. Appleton

D. Surface

1. Hubbell
2. Wiremold

1.04 SUBMITTALS

A. Product data shall include but not be limited to:

1. Cutsheets for raceways, fitting, solvents, primers, etc.

1.05 REQUIREMENTS OF REGULATORY AGENCIES WORK IN ACCORDANCE WITH:

A. National Electrical Code.

B. Local, municipal, or state codes that have jurisdiction.

PART 2 – PRODUCTS

2.01 CONDUIT AND FITTINGS

A. Rigid Galvanized Steel Conduit.

1. Hot-dip galvanized rigid steel conduit, galvanized after fabrication. Products shall comply with UL6 and ANSI C80.1. All threads shall be galvanized after cutting. A uniform zinc coating shall be applied to the inner and outer walls.

2. Fittings shall be threaded and shipped with thread protectors.

B. Aluminum Rigid Conduit

1. Rigid aluminum (alloy 6063-T1) conduit shall be manufactured using 606 3 Alloy in temper designation T-1. Products shall comply with UL6A and ANSI 680.5

2. Fittings for rigid aluminum conduit shall be threaded aluminum shipped with thread protectors.

C. PVC Coated Rigid Galvanized Steel Conduit.

1. Conduit shall be same as rigid metal conduit with a factory-applied 40-mil-thick covering of polyvinyl chloride (PVC) bonded to the metal.

2. Fittings shall be the same as rigid metal conduit fittings with a factory-applied, 40-mil-thick covering of polyvinyl chloride (PVC) bonded to the metal

D. Intermediate Metal Conduit (IMC).

1. Conduit shall be similar to rigid steel conduit except thinner wall.

3. Fittings shall be threaded hot-dipped galvanized and shipped with thread protectors.

E. Electrical Metallic Tubing (EMT).

1. EMT shall be made of hot-dip galvanized strip steel. The interior shall be coated with a corrosion-resistant lubricant for ease of wiring pulling.

F. Rigid Nonmetallic Conduit (PVC).

1. Conduit shall be schedule 40 or 80 polyvinyl chloride (PVC), UV stabilized, rated for 90°C conductors.

2. Fittings shall be solvent weld socket type.

G. Flexible Metal Conduit (Greenfield).

1. Spirally wound continuously interlocked zinc coated strip steel.

2. Fittings shall be one screw for smaller than 1-1/2-inch, two screw for 1-1/2-inch and larger, double clamp steel or malleable iron, either cadmium plated or hot-dip galvanized.

H. Liquid-Tight Flexible Steel Conduit (Seal Tite).

1. Spirally wound continuously interlocked zinc coated strip steel with a UV stabilized polyvinyl chloride (PVC) outer jacket bonded to the conduit.

2. Fittings shall be compression type, malleable iron, with insulated throat, either cadmium plated or hot-dip galvanized.

PULL BOXES

A. Exterior in-ground pull boxes shall be concrete or polymer as manufactured by Brooks, Dalworth, Hubbell Quazite, or approved equivalent. Covers shall include identification of systems contained.

2.02 WIREWAYS

A. Wireways shall be made of not less than 16-gauge sheet steel for 4 inch and 6 inch square

sizes and 14 gauge steel for 8 inch and 12 inch square sizes. Couplings end plates, and knockouts shall be furnished as required. Each section of wireways shall be rigidly supported.

B. The finish shall be ANSI-49 gray epoxy paint applied by a cathodic electrode position paint process over a corrosion resistant phosphate preparation for NEMA 1 wireways. Provide galvanized steel for NEMA 3R wireways. NEMA 3R wireways and auxiliary gutters are for horizontal mounting only.

2.03 FITTINGS

A. Couplings for rigid steel or intermediate conduit shall be hot dipped galvanized steel. Set screw type is not acceptable.

B. Steel or malleable iron fittings shall be used on all other raceway types except for PVC. Die-cast fittings are not allowed.

C. Couplings for aluminum raceways shall be threaded aluminum.

D. EMT systems shall utilize steel insulated throat, threadless, water tight compression type connectors and threadless steel water tight compression type couplings.

E. Coupling and connectors accessories and fittings for PVC coated rigid galvanized steel shall be PVC coated.

F. Liquidtight Flexible Metal Conduit (LFMC) fittings shall be steel. Plastic is not acceptable.

G. Provide nylon bushing on end of all low voltage cabling system conduits (sleeves, rough-ins, etc.).

PART 3 - EXECUTION

3.01 PROVIDE CONDUIT AS FOLLOWS:

A. GENERAL

The Drawings are diagrammatic, and are intended to show the general location of outlets, devices, fixtures, and arrangement and control of circuits. The Contractor shall determine exact locations by actual measurement of the building or by reference to the Architectural Drawings.

B. Except as noted or otherwise specified, all wiring shall be installed in galvanized rigid steel, rigid aluminum conduit or electrical steel tube (EMT) of the proper size to contain the number of conductors required in accordance with the latest edition of the N.E.C. Where conduit sizes are shown on the drawings, these shall take preference. Contractor shall epoxy coat galvanized rigid steel conduit for use in natatoriums.

C. EMT in sizes up to 4 inches when concealed or not exposed to damage and located indoors only. (EMT is not acceptable in wet and damp location.)

D. PVC coated rigid galvanized steel shall be used for all penetrations of slab on grade.

E. Rigid galvanized steel where embedded in concrete or masonry construction, mechanical yard or in exterior/interior applications where subject to damage.

F. Rigid aluminum shall be used in exterior applications. (i.e. roof, top of canopies)

G. PVC schedule 40 and 80 may be utilized underground, in or below slab where shown on the construction documents.

H. MINIMUM SIZE: [3/4] inch. All homeruns shall be 3/4" minimum.

I. PVC coated rigid galvanized steel conduit shall be coated inside and outside.

J. PVC coated rigid galvanized steel conduit shall be used at cooling towers, corrosive areas and pool pump rooms.

K. Fixture whips: Refer to 26 51 00 for additional information.

L. Flexible metal shall be used for connecting rotating equipment installed in conditioned spaces.

M. Liquidtight Flexible Metal Conduit (LFMC) shall be used for connecting rotating equipment installed in non-conditioned spaces and outside.

N. Of such size, and so installed that conductors may be drawn in without injury or excessive strain.

O. Where entering panels, pull boxes, junction boxes, or outlet boxes, shall be secured in place with lock nuts inside and outside, and insulated bushings inside.

P. Have Red seal type VCC or approved equal cable supports in risers, as required by N.E.C.

Q. Have ends reamed after cutting and application of die.

R. Keep conduit corked and dry during construction, and swab out before conductors are pulled.

S. Have bends and offsets made with approved tools. Bends or offsets in which the pipe is crushed or deformed shall not be installed.

T. Where not embedded in concrete or masonry, be firmly secured by approved clamps, half-straps or hangers.

U. Have O.Z. Gedney or approved equal expansion fittings where crossing building expansion joints.

V. Except in the mechanical equipment rooms, run conduit concealed, and by the shortest practicable route between outlets. Install risers, drops, and offsets necessary to avoid

conflict with ductwork, piping, structural members, and similar items.

W. Install exposed conduit in mechanical rooms, and elsewhere as indicated, parallel to horizontal and vertical lines of walls, ceilings, and floors.

X. Fixtures in finished areas having suspended acoustical ceilings shall be connected to outlet boxes of lighting grid by flexible metal conduit; length not to exceed ten feet (six feet if using 3/8" manufactured fixture "whips").

Y. Outlet boxes in partitions shall never be set back to back. They shall be offset to prevent undue noise transmission from room to room.

Z. Concealed conduit shall run in as direct manner as possible using long bends. Exposed conduit shall be run parallel with or at right angles to the lines of the building; and all bends shall be made with standard conduit elbows or conduit benders. Not more than equivalent of four quarter bends shall be used in any run between terminals and cabinet, of between outlet or junction boxes. Approved condulets shall be used in lieu of conduit elbows where ease of installation and appearance warrants their use and approved by the engineer. Conduit joints shall be made with approved couplings and unions.

AA. Conduits shall be continuous from outlet to outlet and from outlets to cabinets, junction or pull boxes and shall be electrically continuous throughout. Terminals of all conduits shall be provided with double lock nuts and bushing or terminated on conduit hubs. Use of running threads is prohibited.

BB. Each entire conduit system shall be installed complete before any conductors are drawn in. Every run of conduit shall be finished before covering up to guard against obstructions and omissions.

CC. Sleeves shall be placed in the forms of concrete, masonry and fire rated walls, floor slabs and beams, for the passage of conduits. Sleeves should be set in place a sufficient time ahead of the concrete work so as not to delay the work. Sleeves shall be rigid galvanized steel with a minimum thickness of 1.07MM and set to extend 4" above slab.

DD. All pipe penetrations through walls and concrete floors shall be fire rated by applying USG Thermafiber in the space between the concrete and the pipe. The fire rating shall be additionally sealed by using 3M brand model CP 25 or 303 fire barrier caulk and putty. All fire rating material shall be installed in accordance with manufacturer's printed instructions.

EE. All conduit shall be cleaned and swabbed to remove all foreign matter and moisture prior to pulling wire and cable. All boxes in which conduits terminate shall be cleaned of all concrete mortar and other foreign matter.

FF. Provide #30 nylon pulling line in all conduits in which permanent wiring is not installed.

GG. All conduit shall be securely fastened and supported using hot galvanized malleable iron one-hole pipe straps, clamps, hanger or other means approved by the engineer. Supports shall be as required per NEC. Tie wire shall not be used as support or securing means. Support conduit independently of ceiling hanger wire. Use all thread rods to support outlet

boxes, junction boxes and conduit.

HH. When PVC conduit is routed underground, all stub-up's and bends 15° and greater shall be PVC coated rigid galvanized steel. Use PVC coated rigid galvanized steel when penetrating concrete on grade.

II. Flexible and liquid-tight flexible steel conduit shall be used for final connections to utilization equipment. Liquid-tight flexible steel conduit shall be used for all exterior locations and all interior locations subject to moisture, vibrations, rotating equipment and dry-type transformers. Refer to Section 26 02 00 for additional information concerning flexible steel conduit**.**

JJ. Route all conduit above grade unless otherwise noted on the construction documents.

KK. Contact the Architect and Engineer for an installation review before covering any below grade or above grade conduit.

LL. All new outlets shall be flush mounted. In remodeled areas where wall construction prohibits flush mounting, provide Hubbell 2400 series, unless noted otherwise. Verify exact location and routing with architect before installation.

MM. Contractor shall not penetrate water proof barriers without using proper fitting to maintain barriers. This shall include exterior walls and slabs. Coordinate with Architect for proper methods.

## 3.02 CONDUIT CORROSION PROTECTION

A. Branch circuit conduits installed in concrete slabs on fill or grade shall be positioned in a manner to ensure complete concrete cover. In no case shall such conduits be exposed below or above the slab surfaces, or penetrate the waterproof membrane.

B. At locations where metallic conduits pass through slabs on grade or transitions below grade, PVC coated rigid galvanized conduit shall be used.

C. Conduit installed in the air gap between the water resistant barrier and finish brick shall not exceed 2ft in length.

## 3.03 EXPANSION JOINTS

A. Install approved expansion fitting in all conduit runs in excess of 150 feet or when crossing building expansion joints.

## 3.04 OUTLET AND JUNCTION BOXES

A. Provide an approved galvanized outlet box with adequate volume for number of conductors installed.

B. Provide standard galvanized switch boxes of the required number of gangs. Switch boxes where conduit is exposed shall be handy boxes or approved equal.

C. Outlet boxes for receptacles shall be similar to Universal 52151 with suitable raised cover. Receptacle boxes where conduit is exposed shall be handy boxes or approved equal.

D. Weatherproof boxes shall be FS or FD. Provide these boxes in all non-conditioned areas, exterior areas and natatoriums.

E. Outdoor boxes shall be NEMA 3R, with conduit connections made by Myers Hubs.

F. See notes and details on Drawings for special box requirements.

G. Provide junction boxes required to facilitate installation of the various conduit systems. Provide support boxes required for risers, each complete with approved cable supports as described elsewhere in this Division.

H. Outlet boxes for drywall shall be standard galvanized 4" square boxes with the appropriate device cover.

I. Provide floor outlet fittings for telephone to match fittings for duplex floor receptacles.

J. Provide 3-1/2” deep gangable masonry boxes in all masonry wall (CMU). Steel City GW-135-G or approved equal.

K. Provide shallow 4”x4” boxes in all demountable partitions.

L. Metallic boxes located in fire rated walls or partitions shall be separated by a minimum horizontal distance of 24 in. This minimum separation distance between metallic boxes may be reduced when “ Wall Opening Protective Materials” (CLIV) are installed according to the requirements of their Classification. Metallic boxes shall not be installed on opposite side of walls or partitions of staggered stud construction unless “Wall Opening Protective Materials” are installed with the metallic boxes in accordance with Classification requirements for the protective materials.

M. Junction, pull boxes, condulets, gutters, disconnects, contactors, etc., above 2-foot x 2-foot grid ceilings shall be mounted within 18-inches of ceiling grid. Above 2-foot x 4 – foot grid ceiling they shall be mounted within 30-inches of ceiling grid. All junction box, pull box, gutter openings shall be side or bottom accessible.

3.05 THRU-WALL SEALS

A. Provide O.Z. Gedney “Thru-wall” seals for all conduits passing through concrete structure below grade, above grade, and floor penetrations below grade. These prevent moisture from entering the building.

B. Straight sleeves are not acceptable.

3.06 PULL BOXES

A. Interior Pull boxes shall be provided for conduit systems as required and shall be

constructed of galvanized steel of not less than gauge and size specified by National Electrical Code. Size pull boxes per NEC 314.28.

B. Where two or more feeders pass through a common pull box, they shall be tagged to indicate clearly their electrical characteristics, circuit number, and panel designation.

C. Exterior in-ground pull boxes shall have open bottoms with sand and rock beds below box for drainage of water. Provide closed bottom boxes where specified. Closed bottom boxes shall be provided with sumps for portable pump to allow for extracting water. Refer to details on the drawings.

D. Pull boxes mounted in pole bases shall be coordinated with the pour of the pole base and shall be flush with finished footing.

3.07 WIREWAYS

A. Wireways shall be installed as indicated or required and locations shall be coordinated with architect.

B. Wiring in wireways shall be neatly bundled, tied and suitably tagged.

**END OF SECTION**

# SECTION 26 09 43.13 - DIGITAL LIGHTING CONTROLS

## PART 1 - GENERAL

### 1.1 SCOPE

A. Contractor shall provide a complete lighting control system that controls all interior, exterior, and emergency lighting fixtures. This shall include but not be limited to all room controllers, occupancy sensors, low voltage control stations, emergency bypass controllers, low voltage control cable, photocells, digital photo sensors, plug load control, input interface modules and contactors.

B. To Establish equivalent performance, all references in this specification are to products manufacturered by Wattstopper. Other Manufacturers are acceptable as listed below.

### 1.2 RELATED SECTIONS

A. Section 26 05 33 - Raceways

B. Section 26 51 19 - Lighting Fixtures - Light Emitting Diode (LED)

C. Section 25 00 00 - Integrated Automation Building integrator shall provide integration of the lighting control system with Building Automation Systems.

### 1.3 REFERENCES

A. NFPA 70 - National Electrical Code

B. National Electrical Manufacturers Association (NEMA)

C. FCC emission standards

D. UL 20 - General-Use Switches

E. UL 508 - Industrial Control Equipment

F. UL 916 - Energy Management Equipment

G. UL 924 - Emergency Lighting

H. UL 1008 - Transfer Switch Equipment

I. UL 2043 - Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces

J. CUL - Underwriter Laboratories of Canada

### 1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Digital Lighting Management System shall accommodate the square-footage coverage requirements for each area controlled, utilizing room controllers, digital occupancy sensors, switches, daylighting sensors and accessories that suit the required lighting and electrical system parameters.

B. System shall conform to requirements of NFPA 70 .

C. System shall comply with FCC emission standards specified in part 15, sub-part J for commercial and residential application.

D. System shall be listed under UL 916 and/or UL 508.

E. Lighting control system shall be configured to fail "on".

1.5 SUBMITTALS

A. Submit under provisions of Section 01 30 00 - Administrative Requirements.

B. Product Data: Manufacturer's data sheets on each product to be used, including:

C. Catalog sheets and specifications.

1. Ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.

D. Storage and handling requirements and recommendations.

E. Installation instructions.

F. Shop Drawings: Wiring diagrams a for the various components of the System specified including:

G. Composite wiring and/or schematic diagram of each control circuit as proposed to be installed.

H. Show location of all devices, including at minimum sensors, load controllers, and switches/dimmers for each area on reflected ceiling plans.

I. Provide room/area details including products and sequence of operation for each room or area. Illustrate typical acceptable room/area connection topologies.

1. Network riser diagram including floor and building level details. Include network cable specification. Illustrate points of connection to integrated systems. Coordinate integration with mechanical and/or other trades.

J. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

K. Closeout Submittals:

L. Project Record Documents: Record actual installed locations and settings for lighting control devices.

M. Operation and Maintenance Manual:

N. Include approved Shop Drawings and Product Data.

O. Include Sequence of Operation, identifying operation for each room or space.

a. Include manufacturer's maintenance information.
b. Operation and Maintenance Data: Include detailed information on device programming and setup.
c. Include startup and test reports.

1.6 QUALITY ASSURANCE

A. Manufacturer qualifications: Company specializing in manufacturing of centralized and distributed lighting control systems with a minimum of 10 years documented experience.

B. Installer Qualifications: Company certified by the manufacturer and specializing in installation of networked lighting control products with minimum three years documented experience.

C. System Components: Demonstrate that individual components have undergone quality control and testing prior to shipping.

1.7 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to commencing Work of this section. Meeting to be attended by Contractor, Architect, system installer, factory authorized manufacturer's representative, and representative of all trades related to the system installation.

B. Review installation procedures and coordination required with related Work and the following:

1. Confirm the location and mounting of all devices, with special attention to placement of switches, dimmers, and any sensors.
2. Review the specifications for low voltage control wiring and termination.
3. Discuss the functionality and configuration of all products, including sequences of operation, per design requirements.
4. Discuss requirements for integration with other trades

C. Inspect and make notes of job conditions prior to installation:

1. Record minutes of the conference and provide copies to all parties present.
2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
3. Installation shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

1.9 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B. Do not install equipment until following conditions can be maintained in spaces to receive equipment:

1. Ambient temperature: 32° to 104° F (0° to 40° C).
2. Relative humidity: Maximum 90 percent, non-condensing.

1.10 WARRANTY

A. Products Warranty: Manufacturer shall provide a 5-year limited warranty on products within this installation, except where otherwise noted, and consisting of a one for one device replacement.

1.11 MAINTENANCE

A. Spare Parts:

1. Provide 1 spare LMSM-6E. Provide 5 spares of each product listed below to be used for maintenance. Electrical contractor shall deliver items to maintenance department within 30 days of substantial completion.
   a. Room Controllers
   b. Occupancy Sensors
   c. Emergency Bypass controllers
   d. Low voltage switches
   e. Daylighting harvesting photocells

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. WattStopper

B. Acuity Brands

C. Cooper/Eaton/Greengate

2.2 DISTRIBUTED DIGITAL LIGHTING CONTROL SYSTEM

A. System General: Provide a WattStopper, Provide Digital Lighting Management System (DLM) complete with all necessary enclosures, wiring, and system components to ensure a complete and properly functioning system as indicated on the Drawings and specified

herein. If a conflict is identified, between the Drawing and this Specification, contact the Architect for clarification prior to proceeding.

1. Daylit Areas: Provide daylight-responsive automatic control in all spaces (conditioned or unconditioned) where daylight contribution is available as defined by relevant local building energy code:
   a. All luminaires within code-defined daylight zones shall be controlled separately from luminaires outside of daylit zones.
   b. Daytime setpoints for total ambient illumination (combined daylight and electric light) levels that initiate dimming shall be programmed in compliance with relevant local building energy codes.
   c. Multiple-level switched daylight harvesting controls may be utilized for areas marked on drawings.
   d. Provide smooth and continuous daylight dimming for areas marked on drawings. Daylighting control system may be designed to turn off electric lighting when daylight is at or above required lighting levels, only if system functions to turn lamps back on at dimmed level, rather than turning full-on prior to dimming.

B. Equipment Required: Lighting Control and Automation system as defined under this section covers the following equipment.

1. Digital Lighting Management (DLM) local network: Free topology, plug-in wiring system (Cat 5e) for power and data to room devices.
2. Digital Room Controllers: Self-configuring, digitally addressable one, two or three relay plenum-rated controllers for on/off control. Selected models include 0-10 volt or line voltage forward phase control dimming outputs and integral current monitoring capabilities.
3. Digital Occupancy Sensors: Self-configuring, digitally addressable, calibrated occupancy sensors with LCD display and two-way active infrared (IR) communications.
4. Digital Switches: Self-configuring, digitally addressable pushbutton on/off, dimming, and scene switches with two-way active infrared (IR) communications.
5. Handheld remotes for personal control: On/Off, dimming and scene remotes for control using infrared (IR) communications. Remote may be configured in the field to control selected loads or scenes without special tools.
6. Digital Daylighting Sensors: Single-zone closed loop, multi-zone open loop and single-zone dual-loop daylighting sensors with two-way active infrared (IR) communications for daylight harvesting using switching, bi-level, tri-level or dimming control.
7. Configuration Tools: Handheld remote for room configuration and relay panel programming provides two way infrared (IR) communications to digital devices and allows complete configuration and reconfiguration of the device / room from up to 30 feet away.
8. Emergency Lighting Control Unit (ELCU): Allows a standard lighting control device to control emergency lighting in conjunction with normal lighting in any area within a building

C. Local Network LMRJ-Series: DLM local network is a free topology lighting control physical connection and communication protocol designed to control a small area of a building.

1. Features of the DLM local network include:
   a. Plug n' Go automatic configuration and binding of occupancy sensors, switches and lighting loads to the most energy-efficient sequence of operation based upon the device attached.
   b. Simple replacement of any device in the local DLM network with a standard off the shelf unit without requiring significant commissioning, configuration or setup.
   c. Push n' Learn configuration to change the automatic configuration, including binding and load parameters without tools, using only the buttons on the digital devices in the local network.
   d. Two-way infrared communications for control by handheld remotes, and configuration by a handheld tool including adjusting load parameters, sensor configuration and binding, within a line of sight of up to 30 feet from a sensor, wall switch or IR receiver.
2. Digital room devices connect to the local network using pre-terminated Cat 5e cables with RJ-45 connectors, which provide both data and power to room devices. Systems that utilize RJ-45 patch cords but do not provide serial communication data from individual end devices are not acceptable.
3. If manufacturer's pre-terminated Cat5e cables are not used for the installation each cable must be individually tested and observed by authorized service representative following installation.

## 2.3 DIGITAL LOAD CONTROLLERS (ROOM, PLUG LOAD AND FIXTURE CONTROLLERS)

A. Digital Load Controllers: Digital controllers for lighting zones, fixtures and/or plug loads automatically bind room loads to the connected control devices in the space without commissioning or the use of any tools. Provide controllers to match the room lighting and plug load control requirements. Controllers are simple to install, and do not have dip switches/potentiometers, or require special configuration for standard Plug n' Go applications.

B. Control units include the following features

1. Automatic room configuration to the most energy-efficient sequence of operation based upon the devices in the room.
2. Simple replacement using the default automatic configuration capabilities, a room controller may be replaced with an off-the-shelf device.
3. Multiple room controllers connected together in a local network must automatically arbitrate with each other, without requiring any configuration or setup, so that individual load numbers are assigned starting with load 1 to a maximum of 64, assigned based on each controller's device ID's from highest to lowest.
4. Device Status LEDs to indicate:
   a. Data transmission
   b. Device has power
   c. Status for each load

d. Configuration status

5. Quick installation features including:
   a. Standard junction box mounting
   b. Quick low voltage connections using standard RJ-45 patch cable
6. Based on individual configuration, each load shall be capable of the following behavior on power up following the loss of normal power:
   a. Turn on to 100 percent
   b. Turn off
   c. Turn on to last level
7. Each load be configurable to operate in the following sequences based on occupancy:
   a. Auto-on/Auto-off (Follow on and off)
   b. Manual-on/Auto-off (Follow off only)
8. Polarity of each load output shall be reversible, via digital configuration, so that on is off and off is on.
9. BACnet object information shall be available for the following objects:
   a. Load status
   b. Schedule state, normal or after-hours
   c. Demand Response enable and disable
   d. Room occupancy status
   e. Total room lighting and plug loads watts
   f. Electrical current
   g. Total watts per controller
   h. Total room watts/sq ft.
   i. Force on/off all loads
10. UL 2043 plenum rated
11. Manual override and LED indication for each load
12. Zero cross circuitry for each load
13. All digital parameter data programmed into an individual room controller or plug load controller shall be retained in non-volatile FLASH memory within the controller itself. Memory shall have an expected life of no less than 10 years.
14. Dimming Room Controllers shall share the following features:
   a. Each load shall have an independently configurable preset on level for Normal Hours and After Hours events to allow different dimmed levels to be established at the start of both Normal Hours and After Hours events.
   b. Fade rates for dimming loads shall be specific to bound switch buttons, and the load shall maintain a default value for any bound buttons that do not specify a unique value.
   c. The following dimming attributes may be changed or selected using a wireless configuration tool:
      1) Establish preset level for each load from 0-100 percent
      2) Set high and low trim for each load
      3) Initiate lamp burn in for each load of either 0, 12 or 100 hours
   d. Override button for each load provides the following functions:
      1) Press and release for on/off control
      2) Press and hold for dimming control
   e. Each dimming output channel shall have an independently configurable minimum and maximum calibration trim level to set the dimming range to match the true dynamic range of the connected ballast or driver. LED level

indicators on bound dimming switches shall utilize this new maximum and minimum trim.

f. Each dimming output channel shall have an independently configurable minimum and maximum trim level to set the dynamic range of the output within the new 0-100 percent dimming range defined by the minimum and maximum calibration trim.

g. Calibration and trim levels must be set per output channel. Devices that set calibration or trim levels per controller (as opposed to per load) are not acceptable.

h. All configuration shall be digital. Devices that set calibration or trim levels per output channel via trim pots or dip-switches are not acceptable.

C. On/Off Room Controllers shall include:

1. Dual voltage (120/277 VAC, 60 Hz) capable rated for 20A total load
2. One or two relay configuration
3. Simple 150 mA switching power supply (Only 4 100 series devices on a Cat 5e local network)
4. Three RJ-45 DLM local network ports with integral strain relief and dust cover
5. WattStopper product numbers: LMRC-101, LMRC-102

D. On/Off/0-10V Dimming KO Mount Room Controllers shall include:

1. Dual voltage (120/277 VAC, 60 Hz) capable rated for 10A total load
2. Optional real time current and voltage monitoring (with - M Monitoring option).
3. One or two relays configurations
4. Smart 150 mA switching power supply
5. Two RJ-45 DLM local network ports. Provide molded strain relief ring
6. One dimming output per relay
   a. 0-10V Dimming - Where indicated, one 0-10 volt analog output per relay for control of compatible ballasts and LED drivers. The 0-10 volt output shall automatically open upon loss of power to the Room Controller to assure full light output from the controlled lighting
7. Units capable of providing both Class 1 or Class 2 wiring for the 0-10V output
8. WattStopper product numbers: LMRC-111, LMRC-111-M, LMRC-112, or LMRC-112-M.

## 2.4 DIGITAL WALL OR CEILING MOUNTED OCCUPANCY SENSOR

A. Digital Occupancy Sensors shall provide graphic LCD display for digital calibration and electronic documentation. Features include the following:

1. Digital calibration and pushbutton configuration for the following variables:
   a. Sensitivity, 0-100 percent in 10 percent increments
   b. Time delay, 1-30 minutes in 1 minute increments
   c. Test mode, Five second time delay
   d. Detection technology, PIR, Ultrasonic or Dual Technology activation and/or re-activation.
   e. Walk-through mode

2. Load parameters including Auto/Manual-ON, blink warning, and daylight enable/disable when photosensors are included in the DLM local network.
3. Programmable control functionality including:
   a. Each sensor may be programmed to control specific loads within a local network.
   b. Sensor shall be capable of activating one of 16 user-definable lighting scenes.
4. Adjustable retrigger time period for manual-on loads. Load will retrigger (turn on) automatically within a configurable period of time (default 10 seconds) after turning off.
   a. On dual technology sensors, independently configurable trigger modes are available for both Normal (NH) and After Hours (AH) time periods. The retrigger mode can be programmed to use the following technologies:
   b. Ultrasonic and Passive Infrared
   c. Ultrasonic or Passive Infrared
   d. Ultrasonic only
   e. Passive Infrared only
   f. Independently configurable sensitivity settings for passive infrared and ultrasonic technologies (on dual technology sensors) for both Normal (NH) and After Hour (AH) time periods.
5. One or two RJ-45 port(s) for connection to DLM local network.
6. Two-way infrared (IR) transceiver to allow remote programming through handheld commissioning tool and control by remote personal controls.
7. Device Status LEDs, which may be disabled for selected applications, including:
   a. PIR detection
   b. Ultrasonic detection
   c. Configuration mode
   d. Load binding
8. Assignment of occupancy sensor to a specific load within the room without wiring or special tools.
9. Manual override of controlled loads.
10. All digital parameter data programmed into an individual occupancy sensor shall be retained in non-volatile FLASH memory within the sensor itself. Memory shall have an expected life of no less than 10 years.

B. Units shall not have any dip switches or potentiometers for field settings

C. Multiple occupancy sensors may be installed in a room by simply connecting them to the free topology DLM local network. No additional configuration will be required.

D. WattStopper product numbers: LMPX, LMDX, LMPC, LMUC, LMDC

## 2.5 DIGITAL WALL SWITCHES

A. Low voltage momentary pushbutton switches in 1, 2, 3, 4, 5 and 8 button configuration. Wall switches shall include the following features:

1. Two-way infrared (IR) transceiver for use with personal and configuration remote controls.

2. Removable buttons for field replacement with engraved buttons and/or alternate color buttons. Button replacement may be completed without removing the switch from the wall.
3. Configuration LED on each switch that blinks to indicate data transmission.
4. Load/Scene Status LED on each switch button with the following characteristics:
   a. Bi-level LED
   b. Dim locator level indicates power to switch
   c. Bright status level indicates that load or scene is active
   d. Dimming switches shall include seven bi-level LEDs to indicate load levels using 14 steps.
5. Programmable control functionality including:
   a. Button priority may be configured to any BACnet priority level, from 1-16, corresponding to networked operation allowing local actions to utilize life safety priority
6. Scene patterns may be saved to any button other than dimming rockers. Once set, buttons may be digitally locked to prevent overwriting of the preset levels.
7. All digital parameter data programmed into an individual wall switch shall be retained in non-volatile FLASH memory within the wall switch itself. Memory shall have an expected life of no less than 10 years.

B. Two RJ-45 ports for connection to DLM local network.

C. Multiple digital wall switches may be installed in a room by simply connecting them to the free topology DLM local network. No additional configuration shall be required to achieve multi-way switching.

D. Load and Scene button function may be reconfigured for individual buttons from Load to Scene, and vice versa.

1. Individual button function may be configured to Toggle, On only or Off only.
2. Individual scenes may be locked to prevent unauthorized change.
3. Fade Up and Fade Down times for individual scenes may be adjusted from 0 seconds to 18 hours.
4. Ramp rate may be adjusted for each dimmer switch.
5. Switch buttons may be bound to any load on any load controller or relay panel and are not load type dependent; each button may be bound to multiple loads.
6. WattStopper product numbers: LMSW-101, LMSW-102, LMSW-103, LMSW-104, LMSW-105, LMSW-108, LMDM-101. Available in white, light almond, ivory, grey, red and black; compatible with wall plates with decorator opening.

E. Keyed switches

1. Provide Hubbell SPDT momentary key switches for ON/OFF and dimming control.

## 2.6 DIGITAL PARTITION CONTROLS

A. Partition controls shall enable manual or automatic coordination of lighting controls in flexible spaces with up to four moveable walls by reconfiguring the connected digital switches and occupancy sensors.

B. Four-button low voltage pushbutton switch for manual control.

1. Two-way infrared (IR) transceiver for use with configuration remote control.
2. Removable buttons for field replacement with engraved buttons and/or alternate color buttons. Button replacement may be completed without removing the switch from the wall.
3. Configuration LED on each switch that blinks to indicate data transmission.
4. Each button represents one wall; Green button LED indicates status.
5. Two RJ-45 ports for connection to DLM local network.
6. WattStopper part number: LMPS-104. Available in white, light almond, ivory, grey and black; compatible with wall plates with decorator opening.

C. Coordinate contact closure interface for automatic control via input from limit switches on movable walls specified in Section 10 22 43 - Sliding Partitions .

1. Operates on Class 2 power supplied by DLM local network.
2. Includes 24VDC output and four input terminals for maintained third party contract closure inputs.
3. Input max. sink/source current: 1-5mA
4. Logic input signal voltage High: > 18VDC
5. Logic input signal voltage Low: < 2VDC
6. Four status LEDs under hinged cover indicate if walls are open or closed; supports LMPS-104 as remote status indicator.
7. Two RJ-45 ports for connection to DLM local network.
8. WattStopper part number: LMIO-102

## 2.7 HANDHELD CONFIGURATION TOOLS

A. Provide a wireless configuration tool to facilitate customization of DLM local networks using two-way infrared communications, and/or PC software that connects to each local network via a USB interface.

B. Features and functionality of the wireless configuration tool shall include but not be limited to:

1. Two-way infrared (IR) communication with DLM IR-enabled devices within a range of approximately 30 feet.
2. High visibility organic LED (OLED) display, pushbutton user interface and menu-driven operation.
3. Must be able to read and modify parameters for load controllers and relay panels, occupancy sensors, wall switches, daylighting sensors, network bridges, and identify DLM devices by type and serial number.
4. Save up to eight occupancy sensor setting profiles, and apply profiles to selected sensors.
5. Temporarily adjust light level of any load(s) on the local network, and incorporate those levels in scene setting. Set room mode for testing of Normal Hours (NH) and After Hours (AH) parameter settings.
6. Adjust or fine-tune daylighting settings established during auto-configuration, and input light level data to complete configuration of open loop daylighting controls.

7. Set room mode for testing of Normal Hours (NH) and After Hours (AH) parameter settings.
8. Verify status of building level network devices.

C. WattStopper Product Numbers: Handheld LMCT-100 (Provide 5 on new construction projects and 3 on renovation projects)

D. User Interface: Each lighting control panel system shall be supplied with at least one handheld configuration tool (LMCT-100). As a remote programming interface the configuration tool shall allow setup, configuration, and diagnostics of the panel without the need for software or connection of a computer. User interface shall have the following panel-specific functions as a minimum:

1. Set network parameters including panel device ID, MS/TP MAC address, baud rate and max master range.
2. Relay Group creation of up to 99 groups. Group creation shall result in programming of all seven key relay parameters for member relays. The seven parameters are as follows: After-hours Override Time Delay, Normal Hours Override Time Delay, Action on Transition to Normal Hours, Action on Transition to After Hours, Sensor Action During Normal Hours, Sensor Action During After Hours, Blink-Warn Time for After Hours.
3. Program up to 254 separate scheduled events. Events shall occur on seven day intervals with each day selectable as active or inactive, and shall be configurable as to whether the event is active on holidays. Holidays are also defined through the User Interface.
4. Program up to 32 separate Dark/Light events. Events shall have a selectable source as either calculated Astro with delay, or a digital IO module with an integral 0-5V or 0-10V analog photocell. Dark/Light events shall occur on seven day intervals with each day selectable as active or inactive, and shall be configurable as to whether the event is active on holidays.
5. Button binding of digital switches to groups shall be accessible via the handheld IR remote and accomplished from the digital switch station.
6. Programming of panel location information shall be accomplished by the handheld IR remote and include at a minimum LAT, LON, DST zone, and an approximate city/state location.
7. WattStopper Product Number: LMCT-100

## 2.8 PROGRAMMING, CONFIGURATION AND DOCUMENTATION SOFTWARE

A. PC-native application for optional programming of detailed technician-level parameter information for all DLM products, including all parameters not accessible via BACnet and the handled IR configuration tool. Software must be capable of accessing room-level parameter information locally within the room when connected via the optional LMCI-100 USB programming adapter, or globally for many segment networks simultaneously utilizing standard BACnet/IP communication.

B. Additional parameters exposed through this method include but are not limited to:

1. Occupancy sensor detection LED disable for performance and other aesthetic spaces where blinking LEDs present a distraction.

2. Six occupancy sensor action behaviors for each controlled load, separately configurable for normal hours and after hours modes. Modes include: No Action, Follow Off Only, Follow On Only, Follow On and Off, Follow On Only with Override Time Delay, Follow Off Only with Blink Warn Grace Time, Follow On and Off with Blink Warn Grace Time.
3. Separate fade time adjustments per load for both normal and after hours from 0 - 4 hours.
4. Configurable occupancy sensor re-trigger grace period from 0 - 4 minutes separate for both normal hours and after hours.
5. Separate normal hours and after hours per-load button mode with modes including: Do nothing, on only, off only, on and off.
6. Load control polarity reversal so that on events turn loads off and vice versa.
7. Per-load DR (demand response) shed level in units of percent.
8. Load output pulse mode in increments of 1second.
9. Fade trip point for each load for normal hours and after hours that establishes the dimmer command level at which a switched load closes its relay to allow for staggered On of switched loads in response to a dimmer.

C. Generation of reports at the whole file, partial file, or room level. Reports include but are not limited to:

1. Device list report: All devices in a project listed by type.
2. Load binding report: All load controller bindings showing interaction with sensors, switches, and daylighting.
3. BACnet points report: Per room Device ID report of the valid BACnet points for a given site's BOM.
4. Room summary report: Device manifest for each room, aggregated by common BOM, showing basic sequence of operations.
5. Device parameter report: Per-room lists of all configured parameters accessible via hand held IR programmer for use with O&M documentation.
6. Scene report: All project scene pattern values not left at defaults (i.e. 1 = all loads 100 percent, 2 = all loads 75 percent, 3 = all loads 50 percent, 4 = all loads 25 percent, 5-16 = same as scene 1).
7. Occupancy sensor report: Basic settings including time delay and sensitivities for all occupancy sensors.

D. Network-wide programming of parameter data in a spreadsheet-like programming environment including but not limited to the following operations:

1. Set, copy/paste an entire project site of sensor time delays.
2. Set, copy/paste an entire project site of sensor sensitivity settings.
3. Search based on room name and text labels.
4. Filter by product type (i.e. LMRC-212) to allow parameter set by product.
5. Filter by parameter value to search for product with specific configurations.

E. Network-wide firmware upgrading remotely via the BACnet/IP network.

1. Mass firmware update of entire rooms.
2. Mass firmware update of specifically selected rooms or areas.
3. Mass firmware upgrade of specific products

F. WattStopper Product Number: LMCS-100, LMCI-100

2.9 EMERGENCY LIGHTING CONTROL DEVICES

A. Emergency Lighting Control Unit - A UL 924 listed device that monitors a switched circuit providing normal lighting to an area. The unit provides normal ON/OFF control of emergency lighting along with the normal lighting. Upon normal power failure the emergency lighting circuit will close, forcing the emergency lighting ON until normal power is restored. Features include:

1. 120/277 volts, 50/60 Hz, 20 amp ballast rating
2. Push to test button
3. Auxiliary contact for remote test or fire alarm system interface

B. WattStopper Product Numbers: ELCU-100, ELCU-200.

PART 3 - EXECUTION

3.1 PREPARATION

A. Do not begin installation until measurements have been verified and work areas have been properly prepared.

B. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that required pre-installation meeting specified in Part 1 of this specification has been completed, recorded meeting minutes have been distributed and all outstanding issues noted have been resolved prior to the start of installation.

3.2 INSTALLATION

A. Install system in accordance with the approved system shop drawings and manufacturer's instructions.

B. Install all room/area devices using manufacturer's factory-tested Cat 5e cable with pre-terminated RJ-45 connectors.

1. If pre-terminated cable is not used for room/area wiring, each field-terminated cable shall be tested following installation and testing results submitted to the Manufacturer's Representative for approval prior to proceeding with the Work.
2. If fixtures have internal DLM Control Modules, ensure that they are also connected with Cat 5e cable.
3. Install all room to room network devices using manufacturer-supplied LM-MSTP network wire or wireless devices. Network wire substitution is not permitted and may result in loss of product warranty.
4. Low voltage wiring topology must comply with manufacturer's specifications.
5. Route network wiring as indicated on the Drawings as closely as possible. Document final wiring location, routing and topology on as built drawings.

C. All line voltage connections shall be tagged to indicate circuit and switched legs.

D. Test all devices to ensure proper communication.

E. Calibrate all sensor time delays and sensitivity to guarantee proper detection of occupants and energy savings. Adjust time delay so that controlled area remains lighted while occupied.

F. Provide written or computer-generated documentation on the configuration of the system including room by room description including:

1. Sensor parameters, time delays, sensitivities, and daylighting setpoints.
2. Sequence of operation, (e.g. manual ON, Auto OFF. etc.)
3. Load Parameters (e.g. blink warning, etc.)

G. Post start-up tuning - Adjust sensor time delays and sensitivities to meet the Owner's requirements 30 days from beneficial occupancy. Provide a detailed report to the Architect / Owner of post start-up activity.

H. Tighten all panel Class I conductors from both circuit breaker and to loads to torque ratings as marked on enclosure UL label.

I. All Class II cabling shall enter enclosures from within low-voltage wiring areas and shall remain within those areas. No Class I conductors shall enter a low-voltage area.

J. Run separate neutrals for any phase dimmed branch load circuit. Different types of dimming loads shall have separate neutral.

K. Verify all non-panel-based lighting loads to be free from short circuits prior to connection to room controllers.

## 3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing. Notify Architect and Manufacturer in writing a minimum of 3 weeks prior to system start-up and testing.

B. Tests and Inspections: Manufacturer's service representative shall perform the following inspections and prepare reports.

1. Verify Class I and II wiring connections are terminated properly by validating system performance.
2. Set IP addresses and other network settings of system front end hardware per facilities IT instructions.
3. Verify / complete task programming for all switches, dimmers, time clocks, and sensors.
4. Verify that the control of each space complies with the Sequence of Operation.
5. Correct any system issues and retest.

C. Provide a report in table format with drawings, or using a software file that can be opened in the manufacturer's system software including each room or space that has lighting control installed. Indicate the following:

1. Date of test or inspection.
2. Loads per space, or Fixture Address identification.
3. Quantity and Type of each device installed
4. Reports providing each device's settings.

3.4 OPERATIONS PERSONNEL TRAINING

A. Provide a training session for the owner’s operations personnel. Training session shall be performed by a qualified person who is knowledgeable in the subject/equipment. Submit a training agenda two (2) weeks prior to the proposed training session for review and approval. Training session shall include at the minimum:

1. Purpose of equipment.
2. Principle of how the equipment works.
3. Important parts and assemblies.
4. How the equipment achieves its purpose and necessary operating conditions.
5. Most likely failure modes, causes and corrections.
6. On site demonstration.

3.5 RE-COMMISSIONING

A. After 90 days from occupancy the factory authorized representative and electrical contractor shall re-calibrate all sensor time delays and sensitivities to meet the Owner’s Project Requirements. Provide a detailed report to the Architect / Owner of re-commissioning activity.

END OF SECTION

**SECTION 26 27 26 – WIRING DEVICES**

PART 1 – GENERAL

1.1 SCOPE

A. Provide wiring devices as shown; scheduled, required and as specified.

B. The types of wiring devices required include:

1. Receptacles
2. Switches
3. Coverplates

1.2 STANDARDS

A. NEMAWD-1

B. NEMA WD-5

C. UL

D. Federal Spec WC-596-F and WS-896

1.3 ACCEPTABLE MANUFACTURERS

A. Hubbell

B. Leviton

C. Pass & Seymour

1.4 SUBMITTALS

A. Shop drawings shall include but not be limited to:

1. Cut sheets of all devices indicating NEMA configuration, rating, materials, color,
and all accessories.
2. Cut sheets of all coverplates indicating materials, color and any engraving specified on drawing or in the specifications.

1.5 REQUIREMENTS OF REGULATORY AGENCIES WORK IN ACCORDANCE WITH:

A. National Electric Code.

B. Local, municipal, or state codes that have jurisdiction.

PART 2 – PRODUCTS

2.1 MATERIALS AND COMPONENTS

A. GENERAL
1. Provide factory assemble wiring devices with the rating type and color as required and specified for the service indicated.
2. Provide matching one-piece multiple gang plates where switches are ganged.
3. Provide wall plates for each receptacle furnished.
4. Architect reserves the right to select wiring device styles and colors to match wall finish.
5. Wall plates shall be of same manufacturer as devices.

2.2 SWITCHES

A. Provide specification grade decora style rocker switches where indicated on the Drawings. Provide "Red" switches for switching emergency lighting circuits where switching is indicated. Coordinate exact locations and color with architect.

B. Wall switches shall be 20 amp, 120-277 volt and shall be Hubbell Decorator Series, Leviton, Decora or Pass & Seymor Decorator, as follows:
1. SINGLE POLE SWITCHES: Leviton 5621-2, P&S 2621, Hubbell DS120
2. DOUBLE POLE SWITCHES: Leviton 5622-2, P&S 2622, Hubbell DS220
3. THREE WAY SWITCHES: Leviton 5623-2, P&S 2623, Hubbell DS320
4. FOUR WAY SWITCHES: Leviton 5624-2, P&S 2624, Hubbell DS420
5. MOMENTARY CONTACT SWITCHES:
Hubbell HBL1557, Leviton 1257, P&S 1251
6. THREE POSITION, TWO CIRCUIT MAINTAINED CONTACT SWITCHES:
Leviton 1285, Hubbell HBL1385, P&S 1225

C. Dimmers: Provide Lutron DIVA wall box dimmers sized to handle the load or as shown on drawings. Where fluorescent dimming ballasts are to be used, coordinate wall box dimmer with ballast manufacturer.

D. Light Handle Switches: Provide Leviton 5649-2 or P&S 2625 lighted handles to switch emergency lights where noted on the drawings.

2.3 RECEPTACLES

A. Provide specification grade, Decora type receptacles where indicated on the drawings. Provide “Red” receptacles for receptacles on emergency power. Coordinate exact location with architect.

B. Receptacles shall be Hubbell StyleLine Decorators Series, Leviton, Decora or Pass & Seymour Decorator as follows:

1. Duplex 20A-125V-self grounding: (NEMA configuration 5-20R):
Hubbell DR20, Leviton 16362, or P&S 2091.
2. Simplex 20A-125V-Self Grounding: (NEMA configuration 5-20R): Leviton 1635 or P&S 26361.
3. Isolated ground duplex, 20A-125V: (Orange, NEMA configuration 5-20R)
Hubbell IG20DRX, Leviton 16362-IG or P&S IG8300XSP (where X denotes color.

4. Clock hanger receptacle 20A-125V: (Brown with stain finish stainless steel plate with hanger, NEMA configuration 5-20R).
   Hubbell 5235, Leviton 5361-CH P&S S3733-SS
5. Ground fault circuit interrupter (GFCI) receptacle 20A-125V; GF-5352. (NEMA Configuration 5-20R, shall incorporate self-test, auto monitoring technology and features which will lock-out or render the device incapable of being reset if ground fault protection is compromised, with "Feed through" connectors capable of protecting connected downstream receptacles on a single circuit, and of being installed in a 2-3/4" deep outlet box without adapter,Hubbell GFRST20, Leviton GFNT2 or P&S 2097.
   Install Hubbell GFTRST20, Leviton GFTR2 or P&S 2095TR Tamper Resistant type for locations requiring Tamper Resistant installations]
6. Install Hubbell GFTWRST20, Leviton GFWR2 or P&S 2097TRWR Weather Resistant type for installations in damp and wet locations.
7. Tamper resistant receptacles 20A-125V: (NEMA configuration 5-20R):
   Hubbell DR20TR, Leviton 16262-SG, P&S TR26362 – HIGH LTG.
8. Surge Protection Duplex Receptacles 20A-125V, (NEMA 5-20R) Hospital grade to include LED light and audible alarm:
   Hubbell HBL8362SA, Leviton 8380, or P&S 8300SP
9. Special equipment receptacles shall be coordinated with owner/manufacturer requirements and the correct and appropriate receptacle and coverplate shall be installed.
10. USB Charger types receptacles to b Hubbell, 20A, 125V AC Hospital Grade, Tamper Resistant, with two USB Type 2.0 Ports 5.0 Amp, 5V DC, Decorator Type duplex receptacle. Hubbell USB8300A5 or equal by other approved wiring device manufacturers.
11. Plug load controlled receptacles to be Hubbell DR20C2WHI, white, two controlled faces or equal by Leviton of P&S.
12. ARC Fault circuit interrupter receptacles shall be Hubbell AFR20TR.
13. Ground fault circuit interrupter/ARC Fault dual function receptacles shall be Hubbell AFGF20TR.

## 2.4 OCCUPANCY SENSORS

A. Provide dual technology wall mounted sensors, coordinate color from manufacturers full range and provide one of the following:
   1. Single Pole:
      - Wattstopper #DSW301
      - Lutron #MSA102
   2. Double Pole:
      - Wattstopper # DSW302
      - Lutron #MSA202
   3. Dimmer:
      - Wattstopper #DW311
      - Lutron #MSZ101

B. Provide dual technology ceiling sensor with low voltage controlling switch and power pack.
   1. Single Button:
      - Wattstopper # DT300 Sensor, BZ150 Power Pack and LVSW101 Digital Switch
      - Lutron; LOSCDT-2000 Sensor, PP-DV-M Power Pack and NTRCS-1 Digital Switch

C. Provide Ultra Sonic Ceiling sensor for restrooms.
   a. Wattstopper #UT3000, BZ150 Power Pack

b. Lutron #LOS-CUT-2000, PP-DV-M Power Pack

2.5 PLATES

A. Furnish and install plates on all outlet boxes. Oversize (Jumbo) plates are not acceptable.

B. Plates shall be light almond unless otherwise noted on plans. Confirm color with architect prior to ordering.

C. Provide Hubbell WP Series, Bell, Carlon or Leviton NEMA 3R weatherproof coverplates on all exterior wiring devices. Enclosure shall be suitable for wet locations when in use.

D. Plates shall be Hubbell SS Series, Leviton, Pass & Seymour 302/304 smooth stainless steel on all receptacles 30 amps and larger.

E. Stainless steel device plates shall be provided at locations with tile or stone walls.

2.6 Floor boxes with surface activation shall be cast iron as manufactured by Hubbell or equal by Wiremold and as indicated below:

A. Slab at grade (dual level, fully adjustable type 1).

1. Single gang: #B-2436 w/#SB-3083 carpet flange.
2. Two gang: #B-4233 w/#SB-3084 carpet flange.
3. Three gang: #B-4333 w/#SB-3085 carpet flange.

B. Slab above grade (shallow, fully-adjustable, type II)

1. Single gang: #B-2421 w/#SB-3083 carpet flange.
2. Two gang: #B-2422 w/#SB-3084 carpet flange.
3. Three gang: #B-2423 w/#SB-3085 carpet flange.

C. Cover plates shall have brass finish as follows:

1. #S-3825 for duplex flap for duplex receptacles.

2. #S-3826 for data/communications.

2.7 PVC floor boxes manufactured by Hubbell or equal shall be as follows:

A. Provide CFBS1R4CFB dual service cast iron body floor box with PVC riser. Provide CFBS1R4CUP adjustable mounting cup, S1R4SP2X2DUPLEX sub-plate for (1) Duplex and (2) RJ-45 Keystone jacks OR S1R4SP2X2STYLE for (1) GFCI duplex, USB or Surge Device & (2) Keystone jacks, OR S1R4SPQUAD sub-plate with (4) 20A simplex receptacles, single and dual circuit wiring capability. Provide with CFBS1R4CVR cover, Color to be chosen by Architect.
NOTE TO SPECIFIER: Minimum depth of pour 5-inches, Maximum is 6-inches Maximum finished floor thickness (above top of box collar) with maximum adjustability is 1-1/2-inches at 5-inch, At 6-inches maximum adjustability is 1/2".

2.8 Floor boxes, recessed activation type, meet UL 514A scrub water requirements, shall be stamped steel with corrosion resistant finish, UL Listed for slab-on-grade installations, or stamped steel for above-grade installations as manufactured by Hubbell or equal by Wiremold and as indicated below:

A. Recessed Activation Slab at grade:

1. Two gang: #CFB2G30CR or CFB2G30RCR (provisions for round cover), capable of up to 2" entry per gang. Flush flange, Surface flange and Furniture Feed cover availability. Surface Type Covers shall not exceed 0.15" rise. Covers with provisions for cable egress, when in use, shall not exceed/extend past 0.15" rise

2. Four Gang: #CFB4G30CR or CFB4G30RCR (provisions for round cover), capable of up to 2" entry per gang. Flush flange, Surface flange availability. Cover shall not exceed 0.15" rise. Surface Type Covers shall not exceed 0.15" rise. Covers with provisions for cable egress, when in use, shall not exceed/extend past the 0.15" rise.

3. Six Gang: #CFB6G30CR or CFB6G30RCR (provisions for round cover), capable of up to 2" entry per gang. Flush flange, Surface flange availability. Surface Type Covers shall not exceed 0.15" rise. Covers with provisions for cable egress, when in use, shall maintain the 0.15" rise. Covers with provisions for cable egress, when in use, shall not exceed/extend past the 0.15" rise.

4. Ten Gang AV: #CFB10G55CR or CFB10G55RCR (provisions for round cover), with minimum (2) 2" KO's, multiple front and back ¾" to 1-1/2" concentric KO's.. Flush flange, Surface flange availability. Cover shall not exceed 0.15" rise. Covers with provisions for cable egress, when in use, shall not exceed/extend past the 0.15" rise.

B. Recessed Activation Slab above grade

1. Two Gang: #CFB2G30 or CFB2G30R (provisions for round cover), capable of up to 2" entry per gang. Flush flange, Surface flange and Furniture Feed cover availability. Surface Type Covers shall not exceed 0.15" rise. Covers with provisions for cable egress, when in use, shall not exceed/extend past the 0.15" rise.

2. Four Gang: #CFB4G30 or CFB4G30R (provisions for round cover), capable of up to 2" entry per gang. Flush flange, Surface flange availability. Cover shall not exceed 0.15" rise. Surface Type Covers shall not exceed 0.15" rise. Covers with provisions for cable egress, when in use, shall not exceed/extend past 0.15" rise.

3. Six Gang: #CFB6G30 or CFB6G30R (provisions for round cover), capable of up to 2" entry per gang. Flush flange, Surface flange availability. Surface Type Covers shall not exceed 0.15" rise. Covers with provisions for cable egress, when in use, shall maintain the 0.15" rise. Covers with provisions for cable egress, when in use, shall not exceed/extend past the 0.15" rise

4. Ten Gang AV: #CFB10G55 or CFB10G55R (provisions for round cover), with minimum (2) 2" KO's, multiple front and back ¾" to 1-1/2" concentric KO's.. Flush flange, Surface flange availability. Cover shall not exceed 0.15" rise.

Covers with provisions for cable egress, when in use, shall not exceed/extend past the 0.15" rise.

C. Service Fittings

1. Surface Style Rectangular for use with carpet, tile, VCT and other engineered floors, available with or without carpet insert and offer system's furniture feed type cover providing (1) 1-inch and (1) 2-inch threaded openings

2 Flush Style Rectangular for use with tile, finished concrete or Terrazzo floors, available with or without carpet insert and offer system's furniture feed type cover providing (1) 1-inch and (1) 2-inch threaded openings

2. Rectangular covers shall be powder coated in variety of common finishes, Aluminum, Black, Brass, Bronze and Satin Nickel

4. Round Covers for use with all floor types. Shall provide cable egress doors and systems furniture feed type cover providing (1) ¾-inch and (1) 2-inch threaded openings. Round covers shall be plated metal in variety of finishes except Black (powder coated). Brushed Aluminum, Brass Plated, Bronze Plated, Satin Nickel Plated.

2.9 Fire rated poke through devices shall be as follows:

A. Installations requiring 4-inch cored openings, poke thru devices shall be manufactured by Hubbell or approved equal, Hubbell S1R4PTFIT Recessed Activation poke thru with either S1R4SP2X2STYLE or S1R4SP2X2DUPLEX sub-plate for (1) 20A Duplex, GFCI OR USB 2 Port Duplex with (2) openings for (2) RJ-45 Jacks with S1R4CVR – color to be chosen by Architect.

B. Installations requiring 6-inch cored openings, with duplex power, shall be manufactured by Hubbell or approved equal, Hubbell S1R6PTWZ-XXX Recessed Activation poke thru which includes S1R6SPW and S1RSSPZ sub plates and S1R6CVR cover, where XXX is finish. Color to be chosen by Architect. This includes (1) pre-wired 20A, 125 V duplex receptacle and (2) NEMA configured rectangular Decorator openings for telephone, signal or up to (12) Category 5e/Cat 6 RJ-45 Jacks.

C. Installations requiring 6-inch cored openings, with quad power, shall be manufactured by Hubbell or approved equal, Hubbell S1R6PTDEH-XXX Recessed Activation poke thru which includes S1R6SPH and S1R6SPE sub-plates and S1R6CVR cover where XXX is finish. Color to be chosen by Architect. This includes (2) pre-wired 20A, 125 V duplex receptacles (quad) single, dual circuit capable and (1) NEMA configured rectangular Decorator opening for telephone, signal or up to (6) Category 5e/Cat 6 RJ-45 Jacks plus (2) additional Keystone openings for a total of (8) Category 5e/Cat 6 RJ-45 Jacks for this sub-plate

D. Installations requiring 8-inch cored openings, shall be manufactured by Hubbell or approved equal, Hubbell S1R8PTFIT3 Recessed Activation poke thru offering (2) perimeter (outer) sub-plate locations and (3) standard NEMA configured openings in center sub-plate location allowing multiple combinations for power, data and A/V connectivity devices including acceptance for third party AV devices such as Crestron, FSR, Extron.

E. Poke thru devices with above floor service fittings shall be Hubbell PT7XC Series or approved equal for 3-inch cored openings with FR280BKA Pedestal Service Fitting for (1) 20A, 125V duplex receptacle and (1) NEMA configured Decorator opening for

telephone, signal or Cat 5e/Cat 6 data cables witw RJ-45 jacks.

F. Poke Thru devices for furniture feed applications shall be Hubbell S1R6PTFF-XXX or approved equal where XXX is finish, to be chosen by Architect. Provides (1) ¾" threaded entry for Power feed and (1) 2-0" threaded opening for Data/AV Cables. Installed in 6-inch cored openings.

G. Poke Thru devices for furniture feed applications shall be Hubbell S1PTFF-XX or approved equal where XX is finish, to be chosen by Architect. Provides (1) ¾" threaded entry for Power feed and (1) 1-1/2" threaded opening for Data/AV Cables. Installed in 4-inch cored openings.

## PART 3 – EXECUTION

### 3.1 WIRING DEVICE MOUNTING HEIGHTS

A. Unless noted to the contrary on plans, or directed otherwise during the progress of the Work, wiring devices shall be set as follows:

1. Switches 42" above finished floor.
2. Wall mounted receptacles shall be installed vertically at 15 inches to the bottom outlet above finished floor unless otherwise noted or as required by local codes.
3. Wall telephone outlets shall be mounted 15 inches to the bottom above finished floor unless otherwise noted. Mount even with wall mounted receptacles.
4. At locations above counters, set devices at 6 inches above to the centerline counter tops, verify exact mounting height with the architect.

### 3.2 INSTALLATION (Refer to 26 05 33 for outlet box specifications).

A. Wall switches shall be set in a suitable steel box and shall be installed on the strike side of the door as finally hung, whether so indicated on the Drawings or not.

B. Receptacles shall be installed in a suitable steel box.

C. The Architect reserves the right to relocate wiring device up to a distance of 5 feet from the location shown, before rough-in, without additional cost.

D. Provide multi-gang device covers at locations where devices gang together.

E. Device locations are indicated schematically on the drawings along with the type and mounting height. Final locations and mounting heights shall be coordinated with the Architect on the jobsite, and with shop drawings of equipment; including equipment to be furnished and installed by the Owner. Devices installed in walls covered with vinyl, fabric wallpaper or other special finishes shall be coordinated and verified with the Architect on the job-site.

F. Stranded wire termination to switches, receptacles, devices and miscellaneous control devices shall be with an approved solderless terminal if clamp type securing is not possible (i.e. Sta-Con crimp on fork tongue connectors; Burndy Type TP-F).

G. Provide keyed switches in all common areas not monitored by the faculty (i.e. gym, corridors, cafeteria, commons natatoriums).

H. Tamper-resistant type receptacles shall be installed in all classrooms, cafeterias, corridors, special education, ALE, computer labs, special use classroom and all spaces where children 7 years and younger may occupy. In Child-Care facilities, tamper resistant receptacles shall be provided for all spaces with exception to back-of-house spaces, such as kitchens, custodial closets, electrical and mechanical rooms.

I. All 20A, 120V receptacles in food service areas shall be GFCI.

J. All circuit breaker serving electric drinking fountains shall be GFCI.

K. Provide ARC Fault circuit interrupters (AFCI) as required to comply with 210.12 of the N.E.C. This shall include but not limited to dwelling units and dormitory's. AFCI breakers may be used.

L. Provide ground fault circuit interrupter (GFCI)/ARC Fault circuit interrupter (AFCI) dual function receptacles to comply with 210.8, 210.12 and 406.4 of the N.E.C.

**END OF SECTION**

**SECTION 26 51 00 - LIGHTING FIXTURES**

PART 1 - GENERAL

1.01 SCOPE

A. Furnish and install general and emergency lighting fixtures as noted on the drawings. Fixtures shall be completely wired with lamps installed and shall be in perfect operating condition at the time of substantial completion.

B. The types of lighting fixtures required for this project include:

1. Fluorescent
2. Incandescent and
3. High-Intensity-Discharge (HID)
4. LED

1.02 STANDARDS

A. All fixtures shall conform to all applicable UL standards and shall be UL label including damp and wet location ratings. “ETL listed” is an acceptable listing.

B. All fluorescent ballast shall comply with certified ballast manufacture (CBM) standard and CBM labeled.

C. NFPA 101

D. ANSI C82.1

E. NEMA-LE

F. IEEE Publication 587 Category "A" (Electronic Ballast)

G. All LED drivers shall be UL recognized Class 2 per UL1310 or non-Class 2 per UL 1012 as applicable.

H. All LED drivers shall comply with applicable requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 15, for Non-Consumer Equipment.

I. All LED drivers shall be RoHS compliant.

J. TM-21

K. LM-80

L. LM-79

M. L70

N. DLC

1.03 ACCEPTABLE MANUFACTURERS

A. Provide lighting fixtures produced by manufacturers as shown and scheduled.

B. BALLAST:

1. Provide one of the following manufacturers
   a. Advance Transformer Company
   b. Universal Lighting Technologies
   c. Osram Sylvania

C. LAMPS:

1. Provide one of the following manufacturers
   a. General Electric Company
   b. Osram Sylvania
   c. North American Philips

1.04 SUBMITTALS

A. Shop drawings shall include a brochure with a separate cut sheet for each fixture type arranged in alphabetical order with fixture and all accessories/options clearly labeled. Provide performance data for each fixture. Provide an independent test lab report for each fixture if requested by the Architect/Engineer.

B. Provide ballast and lamp data brochures indicating which lamp and ballast (if required) will be used in each fixture type.

C. Furnish air handling and heat removal data for light fixtures specified with these requirements.

1.05 REQUIREMENTS OF REGULATORY AGENCIES

A. WORK IN ACCORDANCE WITH:

1. National Electrical Code.
2. Local, municipal, or state codes that have jurisdiction.
3. UL fire resistance directory.

PART 2 - PRODUCTS

2.01 MATERIALS AND COMPONENTS

A. General:

Provide the size, type and rating of each light fixture shown and scheduled. All light fixtures shall complete with reflectors, lens, trim rings, flanges, lamps, lamp holders, ballast, starters, fuses, wiring, earthquake clips, etc. to provide a complete functioning

light fixture.

B. Lighting Fixture Types:

1. Fluorescent Fixtures
   a. Fixture ballast and lamp holders shall be pre-wired and installed. Fixture shall be equipped with a top access plate with knockouts for conduit entry. Fixture shall also include knockouts at each end plate for conduit entry.
   b. Provide disconnect switch as required by the latest version of the National Electrical Code.
   c. Fixtures shall be cold roll steel finished using a multistage iron phosphate pretreatment to ensure maximum bonding and rust inhibitor. Finish shall be a lighting grade, baked white enamel finish with a minimum reflectance of 85%.
   d. Door frame shall be heavy gauge flush white steel or aluminum and hinged from one side and use a positive spring action latch on the other side for latching.
   e. Any lamp shall be easily replaced without removing another lamp.
   f. Fixtures installed in continuous rows shall utilize nipples or other accessories such as snap together plug in connectors supplied by the fixture manufacturer.
   g. Provide battery ballast for emergency light fixtures.
2. Incandescent Fixtures
   a. Fixtures shall be pre-wired equipped with frame in kit and an integral thermal protection required by UL for recessed fixtures.
   b. Provide appropriate trim rings for recessed mounted fixtures compatible with the ceiling in which the fixture is installed.
   c. All lamps shall be inside frosted unless otherwise noted or scheduled.
3. High Intensity Discharge Fixtures (HID)
   a. Fixtures shall be pre-wired with frame-in kit and integral thermal protection required by UL for recessed fixtures. Ballast shall be encased and potted and mounted on the frame-in kit.
   b. Provide remote ballast mounted on a separate mounting plate where indicated or scheduled. Ballast shall include a splice box.
   c. Provide a heat resistant glass shield below the lamp to contain lamp glass envelope and ARC tube to prevent them from falling to the floor and causing damage to life and property. Lamp rated for open fixtures may be used in lieu of glass shield if approved by the engineer.
   d. Provide a fuse and fuse holder installed on the line side of each ballast to prevent branch circuit from tripping due to faulty ballast. The fuse and fuse holder shall be mounted in a junction box for recessed fixtures and in the base of all poles. The fuse holder shall be waterproof when installed in damp or wet locations. Fuse size and type shall be as recommended by ballast manufacturer.
4. LED Fixtures
   a. Fixtures shall be pre-wired with frame-in kit and integral thermal protection required by UL for recessed fixtures. Driver shall be encased in metal-can construction for optimal thermal performance.
   b. Total fixture lumen output is dependent on the chip, thermal

management, driver current and optical system. LED fixtures shall be tested as a complete unit or system. Only DOE recognized CALiPER testing laboratory results shall be utilized.

c. LED fixtures shall have integral common mode and differential mode surge protection of 3kV(1.2/50µs, 2 ohm combination wave).

5. Exit signs
   a. Exit signs shall meet all federal, state and local codes.
   b. Provide fire alarm interface relay when required to flash exit signs.
   c. Provide battery packs for emergency operation when not connected to emergency generator power.

## 2.02 BALLASTS AND DRIVERS - COORDINATE WITH LIGHT FIXTURE SCHEDULE

A. Fluorescent

1. High efficiency electronic ballast shall be high power factor (98% minimum), operate lamp at 40 KHz, less than 10% total harmonic content, NORMAL BALLAST FACTOR (.88) , crest factor less than 1.7, parallel lamp configuration universal voltage, multi-lamp, class "P" thermally protected, sound "A" rating, encased and potted and 0ºF minimum starting temperature. Provide 5 year warranty parts and labor. Ballast shall be Osram Sylvania QHE series or approved equal by Universal Lighting Technologies or Advance Transformer Company.
2. All outdoor ballast unless otherwise noted shall be high power factor, rapid start, class P thermally protected, encased and potted, sound rating B and a 0ºF temperature rating. Ballast shall be CBM certified by an ETL and UL approved.
3. Provide suitable dimming ballast where indicated.
4. Compact fluorescent ballast shall be electronic, shall have circuitry designed to shut down the system reliably and safely when lamps have reached their end of life, high power factor, sound rating “A” and UL approved. Provide 5-year warranty, parts and labor.

B. HID

1. Provide high power factor, constant wattage auto-transformer with a -20 degree F temperature rating. Ballast shall have a sound rating of “B” for lamps less than 400 watts. Ballast for recessed downlights or located remotely shall be encased and potted and shall be provided with a splice box. Provide 120 volt tap for auxiliary lamp when specified.

C. LED

1. Driver manufacturer shall have a 10-year history producing electronic drivers for the North American market.
2. Driver shall carry a five year limited warranty from date of manufacture against defects in material or workmanship (including replacement) for operation at a maximum case temperature of 80 degrees Celsius.
3. Drivers shall not contain any Polychlorinated Biphenyl (PCB).
4. Provide driver with integral color-coded leads.

5. Driver shall operate from 50/60 Hz input source of 120 Volt through 277 Volt or 347 Volt through 480 Volt with sustained variations of +/- 10% (voltage) with no damage to the driver.
6. Driver output shall be regulated to +/- 5% across published load range. And shall have a power factor greater than .90 for primary application to 50% of full load rating with an input current Total Harmonic Distortion (THD) of less than 20% to 50% of full load rating.
7. Provide drivers with a Class A sound rating.
8. Provide LED drivers for outdoor fixtures with a minimum operating temperature of -40 degrees Celsius (-40 F). Provide LED drivers for indoor fixtures with a minimum operating temperature of -20 degrees Celsius (-2F).
9. Drivers shall tolerate sustained open circuit and short circuit output conditions without fail and auto-resetting without need for external fuses or trip devices.
10. Driver output ripple current shall be less than 15% measured peak-to-average, with ripple frequency being greater than 100Hz.
11. Driver performance requirements shall be met when operated to 50% of full load rating.
12. Driver shall have integral thermal foldback to reduce driver power above rated case temperature to protect the driver if temperatures reach unacceptable levels.
13. Drivers shall comply with NEMA 410 for in-rush current limits.
14. Dimmable drivers shall be controlled by a Class 2 low voltage 0-10VDC controller with dimming range controlled between 1 and 8VDC with source current 150µA.

## 2.03 LAMPS – COORDINATE WITH LIGHT FIXTURE SCHEDULE

A. F032T8 fluorescent lamps shall be 24,000 hours 3,500ºK, 32 watt and low mercury. Life rating is based on 3 hours/start.

B. All incandescent lamps shall be inside frosted, extended life rated for 2500 hours unless otherwise noted. 130 volt lamps may be used to provide extended life.

C. All HID lamps shall be base up, base down, horizontal, or universal burn as indicated or specified.

D. All compact fluorescent (T5 and smaller diameter) lamps shall be 3500ºK and 4-pin

# PART 3 - EXECUTION

## 3.01 INSTALLATIONS

A. General

1. Install the type of light fixture where shown and indicated in accordance with manufacturer's written instructions.
2. Provide earthquake clips on all recessed lay-in light fixtures as required by building code.
3. Adjust all adjustable light fixtures, as directed by the Architect.

4. Provide safety chains and wire guards for light fixtures located in gymnasium, multi-purpose rooms, play areas, etc.

B. Coordination

1. The contractor shall verify the type of fixtures with the ceiling types as indicated on the drawings. Any discrepancies shall immediately be brought to the architect's attention before the contractor places his order and accepts delivery. Fixtures shall fit exact in the type of ceiling scheduled. Provide plaster frames, trim rings and other accessories required for a correct fit.
2. Provide supports attached to structural member to support fixtures when the ceiling system cannot maintain support. Provide separate supports for all recessed ceiling mounted HID fixtures.
3. Refer to architectural reflected ceiling plan for the exact location of all light fixtures. Notify the architect for any discrepancies or conflicts with structural, architectural, mechanical piping or ductwork before installation.

C. Mounting

1. Provide support channels to support outlet boxes used support surface mounted light fixtures such as exit signs or downlights.
2. Pendant or surface mounted fixture shall be provided with required mounting devices and accessories, including hickeys and stud-extensions, ball-aligners, canopies and stems. Locations of fixtures in mechanical areas shall be coordinated with mechanical contractor. Mounting stems of pendant fixtures shall be of the correct length to uniformly maintain the fixture heights shown on the drawings or established in the field. The allowable variation tolerance in mounting individual fixtures shall not exceed 1/4 inch and shall not vary more than 1/2 inch from the floor mounting height shown on the Drawings. Fixtures hung in continuous runs shall be installed absolutely level and in line with each other. Hanging devices shall comply with Code requirements. Fixtures shall employ single - not twin - stem hangers unless otherwise noted.
3. All structure mounted fixtures (i.e. bracket mounted, pipe mounted and surface mounted) shall be provided with cables of suitable size and weight to support the weight of the fixture. Cables shall be fastened around or fastened to the housing of the fixture. On pendant fixtures, one safety cable of suitable size and weight to support the weight of the fixture assembly shall connect the top of the pendant to the supporting structure by means of welding or bolting, and one safety cable shall connect the housing of the fixture to the bottom of the pendant. Where more than one pendant per fixture occurs, only one pendant must be cabled. Track fixtures for pendant mounted track shall also be supplied with clip-on safety cables of suitable size and weight to support the weight of the fixture.
4. Provide secondary support wires from all four (4) corners of the lay-in fixtures to the structure above. Do not support fixtures from ceiling grid wire supports, piping, conduit, side walls, or mechanical equipment. Ceiling specifications do not supersede this requirement.

D. Electrical Connection

1. All light fixtures installed in an accessible suspended ceiling shall be connected

from a branch circuit junction box using 1/2" flexible metal conduit or MC cable fixture pigtails not exceeding 8'- 0". Provide #12 AWG conductors. All fixtures must be grounded by using a grounding conductor. Fixture to fixture wiring of fixtures installed in an accessible ceiling is not permitted. Fixture whips shall not lay-on ceiling tile or grid. Provide caddy clips to provide additional support.

E. Fire Rated Ceiling

1. Provide fire rated canopy or enclosure for all fixtures recessed in a fire rated ceiling. The fire rated canopy or enclosure shall be as required by the UL design number listed in the UL fire resistance directory. Refer to architectural drawing for the UL design number. Coordinate with ceiling installer and manufacturer.

F. Air Handling Fixtures

1. Install all air handling light fixtures with return air slot in the open position, if it is to be as an air handling fixture. Coordinate with mechanical contractor.

## 3.02 FINAL INSPECTION

A. Remove all plastic and protective coating from all fixtures. Fixtures shall be thoroughly cleaned. Replace any damaged fixture or fixture parts including reflectors, louvers, lens and metal parts that show signs of corrosion.

B. All final incandescent lamps used during construction shall be replaced with new lamps. Replace all other defective ballast, lamps or discolored lamps, showing signs of excessive usage.

C. Demonstrate proper operation of all fixtures and controls.

**END OF SECTION**

**SECTION 27 05 00 - COMMUNICATIONS GENERAL**

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes all of the General Communications design requirements, administration topics, and installation for communications systems.

B. Related Sections include:

1. 27 10 00 - Category 6 Structured Cabling System
2. 27 41 16 - Integrated AV systems
3. 28 73 30 - IP Security Camera System
4. 28 51 23 - Intercommunication system
5. 28 13 00 - Access control

1.2 REFERENCES

A. The publications listed below form a part of this specification. The publications are referred to in the text by basic designation only.

B. Specific reference in specifications to codes, rules, regulations, standards, manufacturer's instructions, or requirements of regulatory agencies shall mean the latest printed edition of each in effect at the date of contract unless the document is shown dated.

C. Conflicts:

1. Between referenced requirements: Comply with the one establishing the more stringent requirements.
2. Between referenced requirements and contract documents: Comply with the one establishing the more stringent requirements.

D. References:

1. ANSI/TIA/EIA-568-B, Commercial Building Telecommunications Wiring Standards
2. ANSI/TIA/EIA-569-A Commercial Building Standard for Telecommunications Pathways and Spaces
3. ANSI/TIA/EIA-606-A Administration Standard for the Telecommunications Infrastructure of Commercial Buildings

4. J-STD-607 Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications
5. Underwriters Laboratories (UL) Cable Certification and Follow Up Program
6. National Electrical Manufacturers Association (NEMA)
7. American Society for Testing Materials (ASTM)
8. National Electrical Code (NEC), based upon year approved by local codes or AHJ
9. Institute of Electrical and Electronic Engineers (IEEE)
10. UL Testing Bulletin
11. Building Industry Consulting Services International (BICSI) Telecommunications Distribution Methods Manual (TDMM)
12. Local, county, state and federal regulations and codes in effect as of date of purchase
13. Equipment of foreign manufacture must meet U.S. codes and standards. It shall be indicated in the proposal the components that may be of foreign manufacture, if any, and the country of origin.

E. Related Documents

1. Drawings and general provisions of the Contract, including Uniform General Conditions, Supplementary General Conditions, Architectural Plans and Specifications, requirements of Division 1, electrical, mechanical specifications and plans and Telecommunications plans apply to the Telecommunications section and shall be considered a part of this section. The Communications Contractor shall read all sections in their entirety and apply them as appropriate for work in this section.
2. In order to accomplish the conditions of this agreement, the Communications Contractor shall perform the specific duties listed herein.
3. Contract Documents: Drawings and specifications are to be used in conjunction with one another and to supplement one another. In general, the specifications determine the nature and quality of the materials, and the drawings establish the quantities, details, and give characteristics of performance that should be adhered to in the installation of the communications system components. If there is an apparent conflict between the drawings and specifications, the items with the greater quantity or quality shall be estimated upon and installed. Clarification with the Owner about these items shall be made prior to the ordering and installation.
4. The Communications Contractor shall procure, submit for review, and maintain for the duration of this agreement insurance against claims for injuries to persons or damages to property which may arise from, or in connection with, the performance of work hereunder by the Communications Contractor, his agents representatives, employees or subcontractor. The Communications Contractor shall pay the cost of such insurance. The Owner, its directors, officers, representatives, agents and employees, respectively, shall have no responsibility to the Communications Contractor with respect to any insurance in accordance with the provisions set forth herein.
5. Project and cost payment: Refer to General Contractor contract documents and/or master specifications issued by Architect.
6. Communications Contractor will respect and protect the privacy and confidentiality of Owner, its employees, processes, products, and intellectual property to extent necessary, consistent with the legal responsibilities of the State of Texas and Owner policies.
7. Communications Contractor shall sign a non-disclosure agreement and abide by the requirements to keep confidential all information concerning bid documents and this project.
8. Use of subcontractors: Successful bidder shall inform the Owner's contact and General Contractor in writing about the intention to use subcontractors and the scope of work for

which they are being hired. The Owner or Owner's designated contact must approve the use of subcontractors in writing prior to the subcontractor's hiring and start of any work.

9. Communications Contractor shall designate their Project Manager as the single point of contact (name and phone number). Project Manager shall oversee all work performed to ensure compliance with specifications as outlined in bid documents (which includes all specifications and drawings) to ensure a quality installation.

## 1.3 COMMUNICATIONS ABBREVIATIONS

A. C/W: Complete With
B. CBC: Coupled Bonding Conductor
C. Div.1: Division 1 General and Performance Requirements
D. Div. 23: Division 23 Heating, Ventilating, and Air Conditioning
E. Div. 26: Division 26 Electrical Specifications
F. Div. 27: Division 27 Communications
G. Div. 28: Division 28 Electronic Safety and Security
H. EMI: Electromagnetic Interference
I. HC: Horizontal Cross-Connect
J. IC: Intermediate Cross-Connect
K. IDC: Insulation Displacement Connector
L. I/O: Information Outlet
M. LAN: Local Area Network
N. MC: Main Cross-Connect
0. MER: Main Equipment Room
P. N/A: Not Applicable
Q. NIC: Not In Contract
R. OTDR: Optical Time Domain Reflectometer
S. RCDD: Registered Communications Distribution Designer
T. RFI: Radio Frequency Interference
U. TBB: Telecommunications Bonding Backbone
V. TBBIBC: Telecommunications Bonding Backbone Interconnect Bonding Conductor
W. TBC: Telecommunications Bonding Conductor
X. TBD: To Be Determined
Y. TGB: Telecommunications Ground Bus Bar
Z. TMBC: Telecommunications Main Bonding Conductor
AA. TMGB: Telecommunications Main Grounding Busbar
BB.TR: Telecommunications Room
CC.UON: Unless Otherwise Noted
DD. UTP: Unshielded Twisted Pair
EE. WAO: Work Area Outlet

## 1.4 WORK AND MATERIAL BY OTHERS

A. The Owner may separately purchase and/or provide certain equipment and miscellaneous items that will be installed during the course of trim work. Such items may not be indicated in the Documents. Communications Contractor shall cooperate with the Owner and his Suppliers.

B. Furnishing and installation of phone system(s), computer hardware, and related networking software and equipment.

C. Furnishing and installation of routers, switches and UPS's in MER and TR's.

D. Telecommunications grounding busbars and grounding wires connecting to main building electrode system.

E. Dedicated power panels, electrical busways, telecommunication ground busbars, circuits and utility outlets.

F. Furnishing, installation and finishing of plywood backboards.

G. Building mechanical ductwork, cooling/heating system, and environmental control sensors.

H. Communication pathway devices such as but not limited to cable tray in corridors, conduits, vertical "in-slab" sleeves and horizontal entrance sleeves to TR's and MER.

## 1.5 STAFFING

A. Qualification: Submit an up-to-date and valid certification verifying qualifications of the Communications Contractor and installers to perform the work specified herein at time of bid submission.

B. Communications Contractor shall have a complete working knowledge of low voltage cabling applications such as, but not limited to data, voice and video network systems.

C. Contracting firm shall have installed similar systems in at least ten(10) other projects in the last five years prior to this bid and be regularly engaged in the business of installation of the types of systems specified in this document. Certification shall include but not be limited to, items such as name and location of project contacts and numbers, total square footage, total number of cables/drops, types of media, etc.

D. All installer personnel that will be assigned to this project shall be listed in the qualification questionnaire document. Eighty percent (80%) shall have a minimum of 3 years experience in the installation of the types of systems, equipment, and cables specified in this document prior to this bid. Any personnel substitutions shall be noted in writing to Owner/Owner Representative prior to commencement of work.

E. Communications Contractor shall submit evidence of compliance with these requirements prior to beginning work on the project.

F. Cabling installers shall be trained and certified by manufacturer for telecommunication cabling installations and maintenance of said materials.

## 1.6 ADMINISTRATIVE REQUIREMENTS AND COORDINATION

A. Project meetings: Communications Contractor shall provide a person (Name and Contact Number) for coordination with Owner/Owner Representative.

B. Coordinate work of this section with Owner's telephone system specifications, workstations, equipment suppliers, and installers.

C. Coordinate installation work with drop ceiling vendors to coordinate cabling installation time frame in relation to drop ceiling installation. Resolve procedures and installation sequence for both installations. The result of this coordination will be to eliminate as much as possible loss or damage to ceiling materials, associated hardware, and delays to the project. Damage by Communications Contractor to the ceiling installation will be remedied at the Communications Contractor's expense in a timely manner.

D. Coordinate installation work with HVAC and Sheet Metal Contractors to resolve procedures and installation placement for cable trays and cable bundle pathways. The result of this coordination will be to establish priority pathways for critical network data/voice pathways, materials, associated hardware, and delays to the project and to allow service access for communications and HVAC components. Damage by Communications Contractor to the ceiling installation will be remedied at the Communications Contractor's expense in a timely manner.

E. Exchange information and agree on details of equipment arrangements and installation interfaces.

F. Cabling installers shall be trained and certified by manufacturer for Telecommunication Cabling installations and maintenance of said materials.

G. Record agreements reached in meetings and distribute record to other participants, Owner and Owner/Owner Representative.

H. Adjust arrangement and locations of distribution frames, racks, patch panels, and cross-connect blocks in Telecommunication Rooms to accommodate and optimize arrangement and space requirements of any service provider equipment, telephone system, and LAN equipment. Tasks shall be coordinated with Owner or Owner Representative, and other trades' installations.

I. Where installed, confirm exact locations and method of mounting outlets in modular furniture. Follow furniture manufacturers written instructions for cable and installing devices in modular partitions. Obtain modular furniture and power pole locations from the General Contractor. Wiring locations noted in plans along walls for modular furniture are approximate and will have to be determined by Communications Contractor at time of installation. Field condition adjustments for installation may have to be made and coordination efforts with the Electrical Contractor for pathway to comply with 40% fill factor requirements.

J. When requested by Owner or Owner's representative, furnish extra materials that match specified products and that are factory packaged with protective covering for storage and identified with labels describing contents.

## 1.7 CONTRACT ADMINISTRATION

A. Change orders shall be submitted to the Owner/Owner Representative complete with price breakdown and description for approval before any work is done.

## 1.8 PERMITS AND LICENSE

A. Communications Contractor shall supply all City, County, and State Telecommunication Cabling Permits required by appropriate governing agency.

B. Communications Contractor shall be State Licensed and/or bonded for Telecommunications/low voltage cabling systems, if applicable.

## 1.9 ALTERNATES, SUBSTITUTIONS AND CHANGE ORDERS

A. If an alternate material is proposed that is equal to or exceeds specified requirements, Communications Contractor shall provide manufacturers specifications in writing for approval prior to purchase.

B. Substitutions of material by the Communications Contractor shall be in writing complete with written Manufacturers Specifications. The material substituted shall not void, alter or change Manufacturers structured cabling system warranty.

C. Communications Contractor shall provide a complete cabling infrastructure according to these written specifications and drawings. If the Owner changes the scope of work to be performed by the Communications Contractor, it shall be in writing. Communications Contractor shall respond to these changes with a complete material list, including pricing, labor, and taxes in writing presented to the Owner for approval. Communications Contractor shall not proceed with additional scope of work without a signed approval by the Owner.

D. Owner will not pay for additional work performed by the Communications Contractor without signed approval of these changes. Submit a copy of signed change order upon billing.

## 1.10 PRE-INSTALLATION CONFERENCE

A. Attend and/or arrange a scheduled pre-installation conference prior to beginning any work of this Section.

B. Agenda: Clarify questions in writing related to work to be performed, scheduling, coordination, etc. with Owner/Owner Representative.

C. Attendance: Communications Contractor's Project Manager shall attend meetings arranged by General Contractor, Owner's representatives, and other parties affected by work of this Division 27 05 00.

D. All individuals who will be installers of communications cables and equipment in an on-site supervisory capacity, including project managers, and lead installers, shall be required to attend the pre-installation conference. Individuals who do not attend the conference will not be permitted to supervise the installation of, or install, terminate, or test communications cables on the project. This includes supervisors, project managers, and lead installers of this project.

## 1.11 SUBMITTALS

A. The Communications Contractor shall perform no portion of the work requiring submittal and review of record drawings, shop drawings, product data, or samples until the respective submittal has been approved by Owner/Owner Representative and the Engineer. Such work shall be in accordance with approved submittals.

B. Communications Contractor's BICSI Registered Communications Distribution Designer (RCDD) supervisor shall review, approve and stamp all documents prior to submitting.

C. Qualifications: The Contractor shall submit qualification data sheets for firms and persons as specified in the "Quality Assurance", Section 1.13 of this specification. Provide evidence of applicable registration or certification.

B. Proposed product data sheets: The Communications Contractor shall submit catalogue cut-sheets that include manufacturer, trade name, and complete model number for each product specified. Model number shall be handwritten and/or highlighted to indicate exact selection. Identify applicable specification section reference for each product performance for each component specified for approval prior to purchase and installation.

E. Samples: For workstation outlet connectors, jack assemblies, housings and faceplates for color selection and evaluation of technical specifications and requirements. Confirm with Architect, Interior Designer, and Owner representative for color before purchasing materials.

F. Product Certificates: Signed by manufacturers of cables, connectors, and terminal equipment certifying that products furnished comply with requirements.

G. Field Test Reports: Upon completing testing of the installed system, test reports shall be submitted. See Section 3.4 of this documentation for details.

H. Warranty: Deliver manufacturer's signed 20-year Extended Product and System Assurance Warranty of installed cabling system to include all components that comprise the complete cabling system. Delivery to be effective within two weeks of the time of final punch list review. Failure of any component to pass system component tests shall be promptly ameliorated. Communications Contractor shall coordinate with manufacturer for warranty paperwork and procedures prior to the start of the project.

I Communications Contractor must clearly identify any resubmitted drawing sheets, documents or cut sheets either by using a color to highlight or cloud around resubmitted information. Maintain drawing numbering or page/sheet scheme consistency as per previously issued drawings/documents.

J. Cable Testing Plan: The Communications Contractor shall provide a test plan for media testing as described in Section 3.4, C (this specification) prior to beginning cable testing. The following minimal items shall be submitted for review:

1. All testing methods
2. Product data for test equipment
3. Certifications and qualifications of all persons conducting the testing
4. Calibration certificates indicating that equipment calibration meets National Institute of Standards and Technology (NIST) standards and has been calibrated at least once in the previous calendar year
5. Examples of test reports, including all graphs, tables, and charts necessary for display of testing results

K. Cable Testing Reports: The Communications Contractor shall submit cable test reports as follows:

1. Submit certified test reports of Communications Contractor-performed tests in accordance with the Section 3.4 of this document.
2. The tests shall clearly demonstrate that the media and its components fully comply with the requirements specified herein.
3. Electronic and hardcopy versions of test reports shall be submitted together and clearly identified with cable identification.

L Record Drawings: Furnish "as built" CAD drawings of completed work including cable numbers, labeled in accordance with Section 1.12 within this document.

## 1.12 RECORDING AND COPYING TO DRAWINGS OF RECORD (AS-BUILT DRAWINGS)

A. Communications Design drawings to be supplied by the Owner/Owner Representative or the Architect to prepare the Master "As-Built" drawings.

B. As-built drawings shall be in AutoCAD 2006 (or most current) format, same version as usedby Architect. Dimensions and scale of the drawing sheets submitted shall match the size of the drawing used for the contract documents, and shall include the following:

1. Utilize normal recognized drafting procedures that match AutoCAD standards and Architect guidelines and methodology.
2. The As-Built drawings shall incorporate all changes made to the building identified in, but not limited to, Addendum, contemplated change notices, site instructions or deviations resulting from site conditions.
3. Dimensioned plan and elevation views of Networking and Communication System components.
4. All communications work area outlet locations, complete with outlet/cable labeling.
5. Main cable routing paths of communications cables to identified infrastructure pathways.
6. All rack and cabinet locations and labeling there of.
7. One-line diagram of equipment/device interconnecting data/voice cabling of the data and voice systems.
8. Standard or typical installation details of installations unique to Owner's requirements.
9. Graphic symbols and component identification on detail drawing shall conform to the latest EIA/TIA 568-B, 606 and 607 conventions.
10. Submit one soft and one hard copy with project deliverables within 30 days of substantial completion.

## 1.13 QUALITY ASSURANCE

A. Communications Contractor Qualifications. Submit written proof that the following experience requirements are being met:

1. The Communications Contractor shall be a certified Value Added Reseller (VAR) and/or certified by the product manufacturer to provide the minimum of a 20-year, end-to-end product and application warranty, adhere to the engineering, installation and testing procedures and utilize the authorized manufacturer components and distribution channels in provisioning this product.
2. All members of the installation team shall be certified by the manufacturer as having completed the necessary training to complete their part of the installation. Resumes of the entire team shall be provided along with documentation of completed training courses.
3. All Work shall be supervised by a BICSI RCDD, demonstrating knowledge and compliance with all BICSI, TIA/EIA, UL, and NEC methods, standards and codes.
4. The Communications Contractor shall provide five (5) references for projects of equivalent scope, type and complexity of work completed within the last five years.

B. Standard products:

1. Equipment and materials shall be standard products of a manufacturer regularly engaged in the manufacture of telecommunications cabling products and shall be the manufacturer's latest standard design in satisfactory use for at least one year prior to bid opening.
2. Items of the same classification shall be identical. This requirement includes equipment, modules, assemblies, parts, and components.

## 1.14 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions in areas of installation by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating units without field measurements. Coordinate supports, adjacent construction, and fixture locations to ensure actual dimensions correspond to established dimensions.

C. Maintain temperature of between 64 degrees F and 75 degrees F and between 30 and 55 percent humidity in areas of voice and data system components.

## 1.15 COMMUNICATIONS CONTRACTOR'S DUTIES

A. Communications Contractor's RCDD shall approve and stamp all submittals.

B. Provide and pay for all labor, supervision, tools, equipment, test equipment, tests and services to provide and install a complete inside and outside plant fiber and copper infrastructure system. Pay all required sales, gross receipts, and other taxes.

## 1.16 MAINTENANCE AND SUPPORT

A. System Assurance: The System Assurance shall cover the failure of the wiring system to support the application which it was designed to support, as well as additional application(s) introduced in the future by recognized standards or user forums that use the ANSI/TIA/EIA568-B or ISO/IEC IS 11801 component and link/channel specifications for cabling, for a 20-year period.

B. System Certification: Upon successful completion of the installation and subsequent inspection, the customer shall be provided with a numbered certificate, from the manufacturer, registering the installation.

C. Support Availability: The Communications Contractor shall commit to make available local support for the product and system during the Warranty period.

## 1.17 WARRANTY

A. A 20-year Extended Product Warranty and System Assurance Warranty for this wiring system shall be provided.

B. The Extended Product Warranty shall ensure against product defects, that all approved cabling components exceed the specifications of ANSI/TIA/EIA-568-B, exceed the attenuation and NEXT requirements of ANSI/TIA/EIA-568-B for cabling links/channels, that the installation will exceed the loss and bandwidth requirements of ANSI/TIA/EIA-568-B for fiber links/channels, for a 20 year period. The warranty shall apply to all passive structured cabling system components.

C. Communications Contractor shall warrant installation against all product defects, and that all approved cabling components meets or exceeds the requirements of ANSI/TIA/EIA-568-B for a period of 20 years.

D. The Extended Product Warranty and the System Assurance shall cover the replacement or

repair of defective products and labor for the replacement or repair of such defective products. 1.18 DELIVERY AND STORAGE

A. Equipment shall be delivered in original packages with labels intact and identification clearly marked.

B. Equipment shall not be damaged in any way and shall comply with manufacturer's operating specifications.

C. Equipment and components shall be protected from the weather, humidity, temperature variations, dirt, dust, or other contaminants. Equipment damaged prior to system acceptance shall be replaced at no cost to the owner.

D. No equipment materials shall be delivered to the job site more than three weeks prior to the commencement of its installation. Coordinate with General Contractor on location of storage materials.

E. Coordinate deliveries and submittals with the General Contractor to ensure a timely installation.

F. Communications Contractor shall be responsible for all handling and control of equipment.

G. Communications Contractor is liable for any material loss due to delivery and storage problems.

1.19 VEHICULAR ACCESS, PARKING AND DELIVERY

A. Owner shall supply a designated parking location for Communications Contractor to park their vehicles.

B. Owner is not responsible for any material, tools and/or company assets damage due to theft/pilfering by others.

C. Provide a clean work area, which includes parking lot free from cable spools, boxes, trash/rubbish, etc.

D. Coordination with Delivery Company, driver, site address, and contact person will be the responsibility of the Communications Contractor.

E. Communications Contractor is responsible for prompt material deliveries to meet contracted completion date.

1.20 PRODUCT STORAGE REQUIREMENTS AND SITE ACCESS

A. Owner/General Contractor will assign a location or room to store telecommunication materials.

B. Communications Contractor is ultimately/exclusive responsible for loss and/or damage to materials.

C. Communications Contractor will have access to this site as dictated by the General Contractor.

D. If Communications Contractor desires to work after hours or weekends, a work schedule shall be provided, complete with dates, times, and individuals names to the Owner/General Contractor for approval.

E. Owner/General Contractor shall supply a list of security requirements for Communications Contractor to follow.

1.21 PROJECT/SITE CONDITIONS

A. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

B. Communications Contractor shall provide daily, a clean work environment, free from trash/rubbish accumulated during and after cabling installation.

C. Communications Contractor shall keep all liquids (drinks, sodas, etc.) off finished floors, carpets, and tiles. If any liquid damage the above finishes, Communications Contractor at their own expense shall provide professional service to clean or repair scratched/soiled finishes.

## 1.22 ACCEPTANCE

A. Once all work has been completed, test documentation has been submitted, and Owner is satisfied that all work is in accordance with contract documents, the Owner shall notify Communications Contractor in writing of formal acceptance of the system.

B. Communications Contractor must warrant in writing that 100% of the installation meets the requirements specified herein (Standards Compliance & Test Requirements).

***C. Notification of the likelihood of a cable exceeding standardized lengths must be made prior to installation of the cable.*** Owner/Owner Representative *may* agree to allow certain cabling runs to exceed standardized performance criteria (e.g. length). If it is decided to allow the designated cable to exceed standardized lengths, such runs shall be explicitly identified and excluded from requirements to pass standardized tests. Tests for wire mapping, open, shorts, and grounds shall be made if other tests are waived.

D. Acceptance shall be subject to completion of all work, successful post-installation testing which yields 100% PASS rating, and receipt of full documentation soft and hard copies as describe herein. Components yielding "MARGINAL PASS" rating will ***not*** be accepted and shall be promptly ameliorated.

# PART 2 PRODUCTS

## 2.1 WARRANTY AND CONDITIONS

A. Communications Contractor shall provide a minimum one (1) year warranty on installation and workmanship.

B. All materials are to be new and unused and manufacturer shall provide a 20-year warranty.

C. Pre-installation inspection:

1. Visually inspect all cables, cable reels, and shipping cartons to detect possible cable damage incurred during shipping and transport. Visibly damaged goods are to be returned to the supplier and replaced at no additional cost to the Owner.

2. All Communications Contractors must be Manufacturer Certified and installers capable of an installation that falls under Manufacturer's guidelines necessary to obtain Manufacturer Warranty.

## 2.2 ACCEPTABLE MANUFACTURERS and PRODUCTS

A. Fiber Backbone: Belden
B. Copper Riser Cable Category 3 Plenum or Riser Rated: Systimax or Superior Essex
C. Fiber Riser Cable Plenum Rated: Belden
D. Horizontal Plenum Cable: Belden IBDN Category 6
E. Fiber Termination shelves (Rack Mountable): Belden IBDN
F. Patch Panels and Information Outlets (Jacks-Data): Belden IBDN Category 6
G. Copper Patch Cords: Belden IBDN Category 6
H. Fiber Duplex Patch Cables (SC) and Pigtails: Belden IBDN
I. Horizontal cable management: Chatsworth
J. Wall and Rack Mount 110 termination Blocks: Belden IBDN
K. 19" racks and vertical cable management: Chatsworth
L. 12"/18" Horizontal and vertical cable runway (in MER & TR's): Chatsworth
M. Above Ceiling Cable Supporting Hardware: Caddy
N. Wall mounted Black Rack/Enclosures (cabinets): Chatsworth
0. Labeling: Panduit/Brady
P. Horizontal Connecting Hardware: Belden IBDN Category 6
Q. UTP Patch panels: Belden IBDN Category 6
R. Floor Boxes: FSR/Hubbell/Wiremold
S. Building Entrance Frames (BET's): Systimax/AT&T
T. Copper Splicing Modules: 3M gell filled 25 pair splicing module
U. Copper Splice Cases: Preformed Stainless Steel Pressurized
V. Fire Stop systems: 3M / STI / Hilti / Nelson
W. Identification Products:
   a. Cable Labels: Self-adhesive vinyl or vinyl-cloth wraparound tape markers, machine printed with alphanumeric cable designations.
   b. Provide transparent plastic label holders, and 4-pair marked colored labels.
   c. Install colored labels according to the type of field as per EIA/TIA color code designations.
   d. Use EIA/TIA designation strip color-code guidelines for voice, data, cross-connect, riser, and backbone fields.

## 2.3 FIRE STOP PROCEDURES

A. Provide fire resistant intumescent materials to restore fire ratings to al wall, floor, or ceiling penetrations used in the distribution and installation for communications cabling system. Coordinate fire stopping procedures and materials with General Contractor.

B. Install and seal penetrations (conduit, sleeves, slots, chases) through fire-rated barriers created by or made for or on the behalf of the Communications Contractor to prevent the passage of smoke, fire, toxic gas, or water through the penetrations.

C. Solutions and shop drawings/submittals for fire-stop materials and systems shall be presented to the General Contractor for written approval of materials/systems prior to purchase and installation.

D. Materials shall be installed per manufacturer instructions, be UL listed for intended use, and meet NEC and locals codes for fire stopping measures.

E. The material chosen shall be distinctively colored to be clearly distinguishable from other materials, adhere to itself, and remain resilient and pliable to allow for the removal and/or addition of communication cables without the necessity of drilling holes in the material.

F. The fire stopping material shall maintain/establish the fire rated integrity of the wall/barrier that has been penetrated. Provide manufacturer recommended material for rated protection for any given barrier.

G. Provide and install removable, intumescent mechanical systems in floor chases in an approved fashion in all openings greater than 4 inches.

E. Provide and install removable, intumescent, fire-stop bricks/pillows in an approved manner in all openings greater than 4 inches where there are penetrations through walls. Bricks/pillows shall be listed for insertion in fire rated openings and require no restraining materials or apparatus.

F. Communications Contractor shall laminate and permanently affix to each MER/TR wall, adjacent to chases, the following information:
1. Name of manufacturer of fire-stop system.
2. Part & model numbers of system and all components.
3. Phone numbers of manufacturer's corporate headquarters in U.S. and local distributor's name and phone number.

## 2.4 ACCESSORIES

A. The Communications Contractor shall mount one hard copy in color "half-size" of an As-Built floor plan designating work area outlet locations, main cable pathways, and MER/TR locations. Provide clear plastic lamination serving each equipment or communication room. Install the laminated drawings within a protective Plexiglas encasement on the wall of the servicing MER/TR rooms. To ease accessibility the Plexiglas encasement shall be in either flip-down format or file folder format.

## 2.5 QUALITY CONTROL

A. All materials shall be UL and/or ETL approved and labeled in accordance with NEC for all products where labeling service normally applies.

B. Materials and equipment requiring UL 94, 149 or 1863 listing shall be so labeled. Modification of products that nullifies UL labels is not permitted.

C. Within the normal office environment, the installed systems shall not generate nor be susceptible to any harmful electromagnetic emission, radiation, or induction that degrades or obstructs the intended communication transmissions.

D. All material and equipment as provided should be the standard Commercial-Off-The-Shelf (COTS) products of a manufacturer engaged in the manufacturing of such products. All shall be typical commercial designs that comply with the requirements specified. All material and equipment shall be readily available through manufacturers and/or distributors.

E. All equipment shall be standard catalogued items of the manufacturer and shall be supplied complete with any optional items required for proper installation.

F. Coordinate the features of materials and equipment so they form an integrated system. Match components and interconnections for optimum future performance and backward compatibility.

G. Expansion Capability: Unless otherwise indicated, provide spare conductor pairs in cables, positions in patch panels, cross connects, and terminal strips, and space in cable pathways and backboard layouts to accommodate 20 percent future increase in campus distribution and active workstations.

H. Backward Compatibility: The provided solution shall be backward compatible with lower category ratings such that if higher category components are used with lower category

components, the basic link and channel measures shall meet or exceed the lower channel's specified parameters.

I. Component Compliance: The provided solution's components shall each meet the minimum transmission specifications listed herein such that no individual component will be less than specifications for permanent link and channel, regardless of the fact that tests for link and channel ultimately meet required specifications.

J. In the event of a breach of the representations and warranties contained herein, the Communications Contractor, at their own expense, shall take all measures necessary to make the cabling system work and comply with the applicable manufacturer written technical recommendations and standards.

## PART 3 EXECUTION

### 3.1 EXAMINATION

A. Field Measurements: Verify dimensions in areas of installation by field measurements before fabrication and indicate measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the work.

B. Established Dimensions: Where field measurements cannot be made without delaying the work, establish dimensions and proceed with fabricating units without field measurements. Coordinate supports, adjacent construction, and fixture locations to ensure actual dimensions correspond to established dimensions.

### 3.2 PREPARATION

A. Communications Contractor's RCDD supervisor shall review, approve and stamp all shop drawings, coordination drawings and record drawings.

### 3.3 INSTALLATION

A. Install work following specifications, drawings, manufacturer's instructions and approved submittal data.

B. Installation plans and requests for information (RFIs) shall be reviewed by Communications Contractor's RCDD.

C. All work shall be supervised and reviewed by Communications Contractor's RCDD.

D. Allowable Cable Bend Radius and Pull Tension

1. In general, communications cable cannot tolerate sharp bends or excessive pull tension during installation. Refer to the manufacturers' bend radius recommendations for the maximum allowable limits.
2. Cable Lubricants - After installation, exposed cable and other surfaces must be cleaned free of lubricant residue.

E. Pull Lines

1. Provide nylon pull lines in all new conduits, including all conduits with cable installed as part of this contract. Pull test is not to exceed 200 pounds. Data and video cables can be pulled in tandem with pull lines.

F. Conduit Fill

1. Conduit fill shall not exceed 40%.

## 3.4 TESTING

A. Upon completion of the communications infrastructure systems, including all pathways and grounding, the Communications Contractor shall test the system. Approved instruments, apparatus, services, and qualified personnel shall be utilized. If tests fail, Communications Contractor shall correct as required.

B. These specifications will be strictly enforced. The Communications Contractor must verify that the requirements of the specifications are fully met through testing, active data throughput, and documentation as specified below. This includes confirmation of requirements by demonstration, testing and inspection. Demonstration shall be provided in final walk-through and in soft and printed test data. If part or all pairs of cable do not meet specifications contained in this document, the cable shall be replaced at Communications Contractor's cost.

C. Test Plan: provide a complete and detailed test plan for the cabling system specified herein including a complete list of test equipment for copper and fiber components and accessories. Include procedures for certification, validation, and testing. Furnish factory reel tests for all fiber optic cable. Owner will require that the Structured Cabling System installed by the Communications Contractor be fully certified to meet all necessary requirements to be compliant with referenced IEEE and EIA/TIA specifications and Manufacturer's warranty.

D. Correct malfunctioning hardware within each channel or permanent link and retest to demonstrate compliance.

E. Communications Contractor will complete all work and documentation according to Manufacturer guidelines to ensure Manufacturer's warranty remains in effect. Communications Contractor shall obtain certificates from Manufacturer attesting to warranty being in effect and include certificates with other deliverables due at the completion of the project.

F. Owner reserves the right to be present during any or all of testing.

END OF SECTION

**SECTION 27 10 00 - CATEGORY 6 STRUCTURE CABLING SYSTEM (SCS)**

CONDITIONS OF THE CONTRACT AND DIVISION 1, as applicable, apply to this Section.

PART 1 - GENERAL

1.1 RELATED WORK

A. Grounding and Bonding
B. Electrical Hangers and Supports
C. Raceway and Boxes
D. Access Control
E. IP Security Camera System

1.2 DESCRIPTION

A. Summary of Work:
1. Provide a complete and tested Structured Cabling System (SCS) for the interconnections of the Local Area Network (LAN). The SCS shall include fully terminated unshielded twisted pair cables, fiber optic cabling, raceways, conduit, back boxes, copper/fiber optic termination components, station mounting hardware, fiber optic enclosures, patch panels, copper/fiber optic patch cables, relay cabinets/cabinets, and other incidental and miscellaneous premises wiring system hardware as required for a complete, tested, and usable system that is in compliance with the latest NEC, ANSI/EIA/TIA, BICSI, and Authorities Having Jurisdiction codes and standards. The installation shall comply with all applicable requirements, design guidelines, and standards in effect at the job site and as indicated in the Drawings and Specifications.
2. Each IDF will connect to the MDF with a 12-strand multimode armored clad fiber optic cable and a 25-pair, category 3 copper tie cable.
3. An IDF will be required when the distance between outlet termination classrooms and MDF/IDF exceeds 280’, including service loops. IDF's shall be selected and organized to be minimum in number while still reaching all locations to be wired.
4. If there are any discrepancies between the drawings and specification or among themselves, the contractor shall request clarification prior to providing pricing for the scope of work. If a request is not issued and a response not provided via a posted addendum, the contractor shall provide pricing for the most costly scenario and obtain clarification during the course of the project.
**5.** The structured cabling contractor shall provide the cabling infrastructure to support the access control and IP video camera devices. Contractor shall coordinate with Video Surveillance and Access Control integrator(s) for device locations**.**

1.3 QUALITY ASSURANCE

A. Acceptable manufacturers:
1. The equipment/products described herein, and furnished per these specifications shall be the product of one manufacturer or must be able to obtain the full warranty of the combined solution. All references to model numbers and other detailed descriptive data is intended to establish standards of design performance, and quality, as required. The contractor shall not deviate from the part numbers listed.

Any deviation from specified part numbers will result in the removal of non specified materials and reinstallation of approved materials at no cost to the project.

2. The approved manufacturers shall provide a complete category 6 solution with a 25-year performance warranty.
3. Only products listed on parts list will be accepted**.**

B. Installer Qualifications:
1. The Data Cable System Installer shall be licensed and shall meet all applicable regulations of the State of Texas and Department of Labor insofar as they apply to this type of system. The proposer shall be a firm normally employed in the low voltage and data cabling industry and shall provide a reference list of ten (10) large-scale projects and contact names confirming successful Category 6 premises wiring system installations.
2. The SCS Installer shall be a Certified, local area, integrator of the manufacturer's product and must be able to provide the manufacturer's maximum available warranty for the solution on the entire SCS. The contractor's certification must have been obtained and held within 75 miles of the project's location.
3. The installing contractor must have a full-time employed RCDD (Registered Communications Distribution Designer) on staff. Current RCDD certification shall be provided in the product submittals.
4. All individuals installing the SCS must be employees of the certified installer and at least 25% of the installing staff shall have undergone a training class given by the manufacturer. Current certification indicating the successful completion of the training course shall be available upon request at the project and submitted in the contractor's product submittals.
5. The proposing contractor and the installing contractor must be the same company. No subcontractor to the proposing SCS contractor will be allowed for any portion of the SCS scope of work.
6. Pre Approved Contractors: See Parts List.

C. Low Voltage Meeting Requirements:
1. The successful Contractor shall attend a mandatory pre-construction meeting with the project's consultant individuals deemed necessary by the Owner's representative prior to the start of the work. No SCS work shall begin prior to this meeting.
2. The successful contractor shall attend a mandatory bi-weekly meeting to discuss the project progress to help aid coordination with the Owner and Other contractors.
3. Prior to the installation of any items required for this scope of work the contractor must provide a purchase order with a detailed material list for all materials to be installed. The purchase order is not required to show cost but part numbers must be provided. The purchase order will be reviewed during one of the regularly scheduled low voltage meetings.

D. Acceptance:
1. The Owner's representative reserves the right to reject all or a portion of the work performed, either on technical or aesthetic grounds.

E. Warranty:
1. The selected system installer shall be a certified installing contractor of product

and hold current certification. Contractor shall provide a 15-year end-to-end performance warranty on all products installed. The proposer shall provide current certification documentation. The performance warranty shall be issued by the manufacturer and shall warrant that ALL Enhanced Category 6 cable links have been tested bi-directionally (end to end) using a Level 2 or better tester, per TSB-67, and that all test results conform to the most current TIA/EIA-568-A and/or TSB-67 Link values.

2. The warranty will also cover multimode fiber optic cabling. Performance testing shall be conducted in accordance with ANSI/EIA/TIA-526-14 Standard, method B.
3. The warranty will stipulate that all products used in this installation meet the prescribed mechanical and transmission specifications for such products as described in ISO/IEC 11801, ANSI/TIA/EIA-568-A, or EN 50173. Quality and workmanship evaluation shall be solely by the Owner/Designer and designated representatives.

## 1.4 REGULATORY REQUIREMENTS

A. Standards: All work shall be performed in accordance with the latest revisions of the following standards and codes:
   1. Latest Local Codes and Amendments
   2. National Electrical Code, current version

B. Other References:
   1. TIA/EIA-568-B Commercial Building Telecommunications Wiring Standard
   2. EIA/TIA-569 Commercial Building Standard for Telecommunication Pathways and Spaces.
   3. TIA/EIA-606 The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.
   4. TIA/EIA-607 Commercial Building Grounding and Bonding Requirements for Telecommunications.
   5. EIA/TIA 455-A Standard Test Procedure for Fiber Optic Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices and Other Fiber Optic Components.
   6. TIA/EIA TSB 67 Transmission Performance Specification for Field Testing of Unshielded Twisted-Pair Cabling Systems.
   7. TIA/EIA TSB 72 Centralized Optical Fiber Cabling Guidelines
   8. ISO/IEC 11801 Generic Cabling Standard
   9. EN 50173 Generic Cabling Standards for Customer Premises
   10. ANSI/EIA/TIA 526-14 Optical Power Loss Measurements of Installed Multimode Fiber Cable Plan.

C. Governing Codes and Conflicts: If the requirements of these specifications or the Project Drawings exceed those of the governing codes and regulations, then the requirements of these specifications and the Drawings shall govern. However, nothing in the Drawings or Specifications shall be construed to permit work not conforming to all governing codes, regulations, and manufacturer installation requirements.

## 1.5 ABBREVIATIONS

A. The following abbreviations are used in this document:

| | |
|---|---|
| DC | Direct Current |
| IDF | Intermediate Distribution Frame |
| MDF | Main Distribution Frame |
| PBX | Private Branch Exchange |
| UTP | Unshielded Twisted Pair |

1.6 SUBMITTALS

A. Project Initiation:
1. Within fourteen (14) days of Notice to Proceed, the data network system installer shall furnish the following in a single consolidated submittal:
a. Permits: The Contractor shall obtain all required permits and provide copies to the Owner/Architect/Engineer.
b. Product Literature: Complete manufacturer's product literature for all cable, patch panels, cross-connect blocks, cable supports, cable labels, outlet devices, and other products to be used in the installation. In addition, whenever substitutions for recommended products are made, samples (when requested by the Owner/Designer) and the manufacturer's supporting documentation demonstrating compatibility with other related products shall be included. The submittal shall have some type of distinguishing marker or pointer to indicated what specific product is to be provided
c. Construction Schedule: A time-scaled Construction Schedule, using PERT/CPM, indicating general project deadlines and specific dates relating to the installation of the cable distribution system.
d. Testing: Proposed Contractor Category 6 UTP cable test result forms, fiber optic cable test result forms and a list of instrumentation to be used for systems testing.
e. Specification Compliance: A letter shall be provided stating, by section and subsection, that the SCS installer complies with the entire specification section. If the installer intends to deviate from any portion of the specifications, a detailed explanation of reason in which the installer would like to deviate shall be provided in addition to the specification compliance letter. No deviations shall be acceptable until they have been approved by the Owner.
f. Each Submittal must have a detailed parts list with quantities.
g. Certifications: The contractor shall submit all certifications for approved products and the certifications must contain dates which are valid from the date of proposal and not expirer any sooner than 12 months after substantial completion of the project.
1) BICSI RCDD Certification: This certification must be held by an on-staff, full-time employee of the SCS installer. The holder must be staffed out of the office that is located within 75 miles of the projected.
2) Certifications must be obtained by the SCS installer's office that is located within 75 miles of the project and shall be a company certification, not and individual certification.
3) Certifications must be held by at least 25% of the, on-site, staff and be made available at the site if requested by the owner, architect, and/or project's technology consultant.

4) Fiber Optic Technician Certification: This certification must be held by the on-staff/on-site individual that is supervising the fiber optic installation and performing the fiber optic terminations and testing**.**

B. Shop Drawings:
1. Submit the following items, for Owner review and approval, within twenty-eight(28) days of notice to proceed:
a. Proposed circuit routing and circuit grouping plan prepared by a BICSI certified RCDD (Registered Communications Distribution Designer). The RCDD certification must be current. Identifiable, separate routing shall be shown for both the station cabling and the MDF-to-IDF tie cabling.
b. In addition to the cable routing, the submitted drawings shall indicate the following, even if the following is expected to be provided by the project's electrical or general contractor:
1) Location of wall penetrations (all penetrations shall be sleeved and contain protective bushings at both ends)
2) Location of sleeved wall pass-thru
3) Size of sleeve at each location installed
4) Quantity of cable passing through each sleeve
5) Location of drops in each room (quantity or labeling of drops are not required in the submittal plans. Labeling shall be provided in the closeout plans and quantities shall be as per the contract documents, addendums, and issued changes. Each drop shall be labeled for the type of outlet that it is)
6) Conduit routing, size, quantity, and stub-up locations for all floor mounted outlets.
c. Drawing Compliance: A letter shall be provided stating that the SCS installer complies with the entire project drawing, including all general, keyed, and notes to contractor. If the installer intends to deviate from any portion of the specifications, a detailed explanation of reason in which the installer would like to deviate shall be provided in addition to the specification compliance letter. No deviations shall be acceptable until they have been approved by the Owner.
d. All subcontractors shall provide submittals to general contractor for normal distribution to Architects, Engineers and the Owner's project managers.

C. At Substantial Completion: Provide drawings, to the Owner, to reflect installed cabling with correct labeling and cable routing.

D. Close-out Procedures:
1. Two (2) copies of the following documents shall be delivered to the building owner's representative at the time of system acceptance.Close out technology documents shall be separated from ALL other trades documents. The close out finals shall include:
a. Inspection and Test Reports: During the course of the Project, the Contractor shall maintain an adequate inspection system to ensure that the materials supplied and the work performed, conform to contract requirements. The Contractor shall provide written documentation that indicates that materials

acceptance testing was conducted as specified. The Contractor shall also provide documentation, which indicates that all cable termination testing was completed and that all irregularities were corrected prior to job completion.

b. Provide complete test reports for all cabling and devices that comprise system as outlined in this document.
c. Include the Name, address and telephone of the authorized factory representative with a 24-hour emergency service number.
d. The manual shall also include Manufacturer's data sheets and installation manuals/instructions for all equipment installed a list of recommended spare parts.
e. Generic or typical owner's instruction and operation manual shall not be acceptable to fulfill this requirement.
f. An up-to-date record ("as-built") set of approved shop drawing prints that have been revised to show each and every change made to the structure cabling system from the original approved shop drawings. Drawings shall consist of a scaled plan of each building showing the placement of each individual item of the technical cabling system equipment as well as raceway size and routing, junction boxes, and conductor size, quantity, and color in each raceway.
g. As-built Drawings shall include cable pathways, camera locations with correct labeling and MDF/IDF locations.A copy of the AS-Built drawings refecting the final locations of all cabling shall be given to the designated Owner's representative. The as-built drawings shall be prepared using AutoCad 2002 or later. Provide the Owner with electronic versions of the as-builts on CD media.
h. All drawings must reflect final graphic numbering, point to point wiring, device address and programmed characteristics as verified in the presence of the engineer and/or the end user unless device addressing is electronically generated, and automatically graphically self-documented by the system.
i. A copy of the manufacturer's warranty on the installed system.
j. Any keys to cabinets and/or equipment and special maintenance tools required to repair, maintain, or service the system.
k. Operating and Maintenance Instructions for all devices within the system. These instructions shall reflect any changes made during the course of construction, and shall be provided to the Owner, for their use, in a three-ring binder labeled with the project name and description. (4 copies)
l. Upon completion of the work and at a time designated by the Architect or owner, provide formal training sessions for the Owner's operating personnel to include location, operation, and maintenance of all included systems and equipment. Minimum amount of training time shall be at least 4 hours.
m. One (1) 30" x 42" laminated floor plan sheets illustrating technology drops and cable designation with final graphic numbering. Contractor shall provide one complete floor plan sheet for each telecommunications room (MDF or IDF)

## PART 2 - PRODUCTS

### 2.1 GENERAL

A. Installation: The cabling shall be installed per requirements of the manufacturer and the Project Documents utilizing materials meeting all applicable TIA/EIA standards. The Contractor is responsible for providing all incidental and/or miscellaneous hardware not explicitly specified below as required for a complete and operational system.

B. Materials: Materials shall be as listed.

C. Testing: All installed cabling shall be tested 100% good after installation by the Contractor. All final test results shall be delivered to owner at completion of project. Refer to closeout requirements.

D. Ratings: All products shall be new and brought to the job site in the original manufacturer's packaging. Electrical components (including innerduct) shall bear the Underwriter's Laboratories label. All communications cable shall bear flammability testing ratings as follows:

CM Communications Cable
CMP Plenum Rated Communications Cable
CMR Riser-Rated Communications Cable

E. Initial Cable Inspection: The Contractor shall inspect all cable prior to installation to verify that it is identified properly on the reel identification label, that it is of the proper gauge, containing the correct number of pairs, etc. Note any buckling of the jacket that would indicate possible problems. Damaged cable or any other components failing to meet specifications shall not be used in the installation.

F. Cable Lubricants: Lubricants specifically designed for installing communications cable may be used to reduce pulling tension as necessary when pulling cable into conduit.
1. Approved Products
a. Twisted-pair cable: Dyna-Blue
American Polywater

G. Fire Wall Sealant: Any penetration through firewalls (including those in sleeves) will be resealed with an Underwriter Laboratories (UL) approved sealant.
1. Approved Products
a. 3M or
b. Pre-approved equal

## 2.2 DATA CLOSET (MDF/IDF) CATEGORY 6 TERMINATION HARDWARE

1. Approved Products

Horizontal: Refer to Attachment 'A' Approved Materials List
Vertical: Refer to Attachment 'A' Approved Materials List

Provide Velcro straps for cable dressing in MDF/IDF rooms.

B. Network Cabinet Patch Panels: The Category 6 network cable shall be terminated on Modular style Patch Panels, with TS568B RJ45 inserts. Patch panels shall be 19-inch rack mountable. Workstation patch panels shall terminate all workstation communications

outlets. Furnish units that adhere to the performance requirements TIA/EIA-568A standards.

1. Approved Products:
    a. 24-port modular patch panel: Refer to Attachment 'A' Approved Materials List
    b. 48-port modular patch panel: Refer to Attachment 'A' Approved Materials List
    c. Provide category 6 jacks as required to populate 100% of all patch panels installer.

2.3 CABLE ROUTING/PATHWAY

A. Cable Support System: All low voltage cabling shall be installed and supported using a PANDUIT® Corp. J-MOD™ modular cable support system at 48" intervals unless installed in conduit. Do not exceed manufacture recommendation for the quantity of cables supported in an individual support.

B. All cable bundles shall be grouped together using plenum rated Velcro for the entire run above and below the ceilings.

C. Conduit Bushings shall be installed prior to the installation of any cable. If cable is found to be installed without the bushing the cable will have to be removed and re-installed. No cut bushings will be accepted. If cable damage occurs during any portion of the installation, the cable will be removed and replaced at no cost to the project. This item will be strictly enforced and adhered too.

D. The projects electrical contractor shall provide and install all metallic conduit and backboxes indicated to be installed on the drawings. It is the SCS installer's responsibility to coordinate all conduit requirements with the electrical contractor to ensure that all conduit sizes and locations are correctly installed. If box locations and conduit sizes are found to vary from the project documents after installation the SCS installer will bare all financial responsibility to ensure these items are installed correctly. The RCDD for the SCS will be responsible for ensuring conduit sizes are sufficient for cable count while maintaining a 40% fill ratio.

2.4 STATION WIRING

A. Wire: The data and voice wire provided for all outlets shall be (Category 6) unshielded twisted pair, four-pair, 24 AWG solid copper conductor, meeting the intent and quality level of the TIA/EIA-568-A Commercial Building Wiring Standard. Refer to floor plan and data outlet legend for number of active data ports to specified faceplates.

1. Approved Products: For all voice and data connections:
    a. Plenum-Rated Cat 6: Refer to Attachment 'A' Approved Materials List

B. Testing: The Category 6 four-pair UTP cable must be UL Performance Level tested. Each 1000 foot spool must be individually tested with test results affixed to the spool. All cable must be provided on new 1000 foot spools. No shorts will be allowed.

C. Rating: Cable installed in conduit shall be non-plenum rated. Cable not installed in conduit shall be plenum rated if installed in plenum ceiling space, non plenum rated otherwise.

D. All cable shall be routed to the center of the room in which it is serving and then route to the outlet location that it is intended for. Provide a 5' service loop in the center of the room and 5' service loop at each workstation outlet properly supported above ceiling. All workstation service loops shall be made in figure eight configurations, no exceptions.

E. Provide minimum of 10' service loop at all headend locations properly supported above ceiling.

F. All underground or cable to be routed outside building even if it's in conduit should be outdoor cable see Material list for part numbers.

2.5 STATION HARDWARE

A. Flush Mount Jacks: Flush mount jacks shall be high quality Category 6 RJ45 modular jacks with circuit board construction and IDC style or 110-style wire, T568B terminations. Jacks shall meet EIA/TIA TSB40 recommendations for Category 6 connecting hardware.
   1. Approved Products: Refer to Attachment 'A' Approved Materials List
      a. Connector Insert Color per System:
         1) Data/Voice: Blue
         2) Video Surveillance: Blue
         3) Wireless Access Point: Blue

   2. All blank inserts shall be gray in color.

B. Faceplates: Faceplates shall be a 4-port, Stainless Steel
Approved Products: Refer to Attachment 'A' Approved Materials List

C. Outlet Patch Cables: Cabling Contractor shall provide owner with Category 6 patch cable for each data drop on entire project. Each cable will be terminated properly with RJ45 connections on each end with appropriate pin-out assignments per project configuration.

   1. Approved Products:
      a. Cat 6 stranded copper Patch Cords. Patch cable colors to be coordinated with jack color of each system type.
      b. Refer to Attachment 'A' for length and quantity
      c. All patch cables shall be factory terminated. NO EXCEPTIONS.
      d. Refer to Attachment 'A' Approved Materials List

PART 3 - EXECUTION

3.1 GENERAL

A. Fire Wall Penetrations
The contractor shall avoid penetration of fire-rated walls and floors wherever possible. Where penetrations are necessary, they shall be sleeved with metallic conduit and resealed with an Underwriter Laboratories (UL) approved sealant. Contractor shall also seal all floor, ceiling and wall penetrations in fire or smoke barriers and in the wiring closet.

B. Allowable Cable Bend Radius And Pull Tension
In general, communications cable cannot tolerate sharp bends or excessive pull tension

during installation. Refer to the cable manufacturers allowable bend radius and pull tension data for the maximum allowable limits.

C. Cable Lubricants
After installation, exposed cable and other surfaces must be cleaned free of lubricant residue.

D. Pull Strings
Provide pull strings in all new conduits, including all conduits with cable installed as part of this contract. Pull test is not to exceed 200 pounds. Data and video cables can be pulled together with pull strings.

E. Conduit Fill
Conduit fill shall not exceed 40%.

F. Damage
1. The Contractor shall replace or rework cables showing evidence of improper handling including stretches, kinks, short radius bends, over-tightened bindings, loosely twisted and over-twisted pairs at terminals and cable sheath removed too far (over 1-1/2 inches).
2. The Contractor shall replace any damaged ceiling tiles that are broken during cable installation.

G. Clean Up
All clean up activity related to work performed will be the responsibility of the Contractor and must be completed daily before leaving the facility.

H. Conduit and Back Boxes
1. The Contractor shall ensure that the projects electrical contractor provides the appropriate back box and conduit for the project.
2. One (1) 1" conduit will be required each outlet that serves (6) cables or less. Provide addition conduit for cable counts that exceed this number.
3. One (1) double gang deep box will be required for each technology outlet. All boxes except Presentation outlets will be required to have a single gang reducer rings.

3.2 DOCUMENTATION

A. Labels

The Contractor will label all outlets using permanent/legible typed or machine engraved labels approved by the Owner (no handwritten labels permitted). Label patch panels in the wiring closet to match those on the corresponding data outlets. The font shall be at least on-eighth inch (1/8”) in height, block. All labels shall correspond to as-builts and to final test reports.

The following nomenclature should be used when labeling data/voice jacks:

All cables being served by MDF closet shall begin with ‘MDF’ all IDF served cables shall begin with ‘IDF’# (# designated IDF closet number).

Next identification letter shall refer to patch panel that is serving outlet (A, B, C…)

Next identification shall note what # data port on patch panel (1 thru 48).

Example:

Outlet from 23rd port of the third patch panel from top of rack located at IDF-2

IDF 2 -

Outlet from the 5th port of the second patch panel from the top of rack located at MDF

MDF -

B. Floor Plan

A floor plan clearly labeled with all outlet jack numbers shall be included in the as-built plans.

C. Cables: All cables shall be labeled at both ends. This includes but not limited to horizontal voice and data cabling, copper backbone tie cables, and fiber optic cables.

C. Fiber Optics: Fiber optic strands shall be labeled at both ends on the fiber distribution panel.

G. Equipment racks: Equipment racks shall bear at least one indicating label indicated MDF or IDF. If rack is installed in IDF, label shall include IDF #.

H. Access Points: Label ceiling grid with digital label according to location installed.

3.3 EQUIPMENT CABINET CONFIGURATION

A. Equipment Cabinets

Equipment racks shall be assembled and mounted in locations shown on the Drawings and as detailed. Each rack shall be securely mounted to the floor and braced to the wall with cable tray in accordance with the manufacturer's instructions and recommendations. Racks shall be mounted such that the side rails are plumb with vertical cable management panels. Racks to be located such that future expansion can occur without relocating existing racks. Racks shall be grounded in accordance with NEC requirements.

B. Wire Management Components

Horizontal cable management panels shall be installed directly above and below each patch panel. Vertical cable management panels shall be installed on each side of the cabinet.

C. Cable Placement

Cable installation in the Wiring Closet must conform to the Project Drawings. All cabling

shall be routed so as to avoid interference with any other service or system, operation, or maintenance location. Avoid crossing area horizontally just above or below any riser conduit. Lay and dress cables to allow other cables to enter the conduit/riser without difficulty at a later time by maintaining a working distance from these openings.

D. Cable Routing

Cable shall be routed as close as possible to the ceiling, floor or corners to ensure that adequate wall or backboard space is available for current and future equipment. All cable runs within the Wiring Closet shall be horizontal or vertical within the constraints of minimum cable bending radii. Minimum bend radius shall be observed. Cables shall not be tie-wrapped to electrical conduit or other equipment.

E. Installation

All incoming cables shall be routed on the cable tray and neatly dressed down to the patch panels.Cable bundles shall not exceed more than 48 cables to patch panel.

F. Hardware

Provide cabinet and jack panel hardware as required for all data station wiring.

3.4 STATION WIRING INSTALLATION

A. General

Cabling between wiring closet and workstation locations shall be made as individual home runs. No intermediate punch down blocks or splices may be installed or utilized between the wiring closet and the communications outlet at the workstation location.

All cable must be handled with care during installation so as not to change performance specifications. Factory twists of each individual pair must be maintained up to the connection points at both ends of the cable. There shall never be more than one and one-half inches of unsheathed enhanced Category 6 UTP cable at either the wiring closet or the workstation termination locations.

All cable shall be routed to the center of the room in which it serves before routing to the outlet location and a 5’ service loop shall be provide. An addition 5’ service loop shall be provided above ceiling at the outlet location. All service loops shall be figure 8 loops.

B. Exposed Cable

All cabling shall be installed inside walls or ceiling spaces whenever possible. Exposed cables and/or cables routing through mechanical rooms, electrical rooms, or restrooms shall be installed inside conduits, unless noted otherwise on the project drawings.

Additional exposed cable runs will require Owner approval, and will only be allowed when no other options exist.

All cable routing through conduits and sleeves shall maintain a 40% maximum conduit fill

ratio.

C. Placement

All cabling and associated hardware shall be placed so as to make efficient use of available space. All cabling and associated hardware shall be placed so as not to impair the Owner's efficient use of their full capacity.

D. Cable Routes

All cabling placed in ceiling areas must be in conduit, or Panduit Corp. J-MOD modular cable support with Velcro cable wrap at each location. Cable supports shall be permanently anchored to building structure or substrates. Provide attachment hardware and anchors designed for the structure to which attached and that are suitably sized to carry the weight of the cables to be supported. Do not route cable through webbing of structural steel. Cabling must be supported in dedicated supports intended to support cabling as described in this section. Contractor shall adhere to the manufacturer's suggested fill ratio for each size cable support installed. No support shall have more than 48 cables.

Attaching cable to pipes or other mechanical items is not permitted. Communications cable shall be rerouted so as to provide a minimum of 18 inches spacing from light fixtures, sources of heat, power feeder conduits and EMI sources. Cabling shall not be attached to ceiling grid support wires. Cable runs shall be routed down the corridors; parallel or perpendicular to building structure. Multiple cables to be bundled together at and between each cable support installed.

Contractor shall be responsible for coordinating with other trades on the project so that the installed cable pathway does not interfere with the installation of other systems to insure that mechanical ducts, pipes, conduits, or any other above ceiling systems are not putting unnecessary stress on any portion of the install SCS.

All (48) cable bundles shall be routed directly to the MDF or IDF that serves the area. All bundles shall remain separated for the length of the cable run.

3.5 STATION HARDWARE

A. Flush Mount Jacks

Flush mount jacks shall be mounted in a faceplate with back box.

B. Placement
1. Where possible, the communications outlet shall be located so that its centerline is 18 inches above floor level or 12 inches above permanent bench surfaces. Outlets shall not be mounted on temporary, movable, or removable surfaces, doors, or access hatches.
2. Outlets shall be installed within 3'-0" of power outlets

C. RJ-45 Jack Pin Assignments
1. Pin connections for data station cable outlets and patch panels shall match EIA/TIA 568 modular jack wiring recommendation T568B.

2. Pin connections at data jack panels shall match pin connections at outlets (straight through wiring)

3.6 CABLE TESTING REQUIREMENTS

A. Notification: The Owner and Engineer shall be notified one week prior to any testing so that the testing may be witnessed.

B. Inspection: Before requesting a final inspection, the Contractor shall perform a series of end-to-end installation performance tests. The Contractor shall submit for approval a proposal describing the test procedures, test result forms and timetable for all copper and fiber optic cabling.

C. Procedures: Trained personnel shall perform all testing. Acceptance of the test procedures discussed below is predicated on the Contractor's use of the recommended products and adherence to the inspection requirements and practices set forth. Acceptance of the completed installation will be evaluated in the context of each of these factors.

D. Acceptance shall be subject to completion of all work, successful post-installation testing which yields 100% PASS rating, and submittal and approval of full documentation as described above. Tests with the "* PASS" (asterisk) will not be acceptable. These circuits must be repaired to meet "PASS".

E. Errors: When errors are found, the source of each shall be determined, corrected and the cable retested. All defective components shall be replaced and retested. Re-test results must be provided on Owner approved forms and witnessed by Owner.

F. Twisted Pair Cable Testing:
1. At a minimum, the Contractor shall test all station drop cable pairs from Data Closet termination patch panels to outlet device RJ45 jacks. Category 6 products shall be tested for compliance to ANSI/TIA/EIA 568A and ISO/IES 11801 for a Category 6 rated installation. Test equipment used shall meet TIA/EIA TSB-67, Level II accuracy. Further, the contractor shall have a copy of TSB-67 in their possession and be familiar with its contents.
2. Each wire/pair shall be tested at both ends for the following:
   a. Wire map (pin to pin connectivity)
   b. Length (in feet)
   c. Attenuation
   d. Near end cross talk (NEXT)
   e. Power Sum
3. Test equipment shall provide an electronic and printed record of these tests.
4. Test results for each Category 6 four-pair UTP cable must be submitted with identification to match labels on all patch panel ports and RJ45 jacks and must match as-builts associated with that cable.

G. Fiber Optic Cable Testing
1. Testing device for fiber optic cables shall be a high quality OTDR (Optical Time-Domain Reflectometer) equipped with a printer. The printed data shall show, in addition to any summary information, the complete test trace and all relevant scale

settings. The OTDR must have the capability to take measurements from bare fiber strands as well as SC connector terminations.

2. All fiber optic cable shall be tested on the reel before installation to insure that it meets the specifications outlined herein.
3. After installation the Contractor shall test each fiber strand in accordance the EIA 455-171 Method D procedures (bi-directional testing) at both 850nm and 1300nm for multimode or 1310nm and 1550nm for singlemode. A form shall be completed for each cable showing data recorded for each strand including length, total segment (end-to-end) loss (dB) and connector losses (dB) at each end. In addition, the printed data strip for each strand shall be attached to the form. Patch cables shall also be tested.
4. Acceptable fiber optic connector loss shall not exceed .75dB per mated pair. The Contractor is responsible for obtaining minimum loss in fiber connections and polishing per manufacturer specifications.
5. Singlemode:
    a. Singlemode fibers shall have a maximum attenuation of 1.0 dB/km at 1310 nm and 1.0 dB/km at 1550 nm.
6. Multimode:
    a. 50/125um micron multimode fibers shall have a maximum attenuation of 3.5 dB/km at 850 nm and 1.5 dB/km at 1300 nm. Minimum bandwidth shall be 2000 MHz/km at 850 nm and 500 MHz/km at 1300 nm.

## 3.7 INSPECTION

A. Conformance to the installation practices covered above is to be verified when completed. In some cases, the Owner/Designer may inspect before acceptance.
    1. Written Test Report:
        a. Complete test results, including actual values associated with tests.
        b. Show all certifications for telecommunications wiring systems.
        c. Include cable maps showing each cable route and keyed to cable labels. Provide owner with complete floor plans identifying outlet location and cable routing drawing in AutoCad format. Provide electronic copy of drawings to owner in AutoCad version 2004 or greater.
        d. Documentation of outlet, cable and cabinet labeling system.

B. After performing all tests, tabulate results and bind together in format acceptable to Owner. Installer shall provide written certification in the test report that telecommunications cable is properly installed and test results certify system to all specified standards.

**Attachment 'A'**
**Material List**
**Manufacturer Contact and Part Numbers**

***The Communications Contractor shall perform no portion of the work requiring submittal and review of record drawings, shop drawings, product data, or samples until the respective submittal has been approved by project's Technology Consultant.**

**MATERIAL LIST**

| MANUFACTURER | DESCRIPTION | PRODUCT NUMBER | NOTES |
|---|---|---|---|
| Chatsworth | 2-post Relay Rack | 19" | Existing in IDF 30118 |
| Chatsworth | 2-hole Grounding Compression Lug | | Existing in IDF 30118 |
| Chatsworth | ¼"x4"x12" Telecommunications Ground Busbar | | Existing in IDF 30118 |
| Belden | 4RU Fiber Optic Enclosure | IBDN | Existing in IDF 30118 |
| Belden | 2RU Fiber Optic Enclosure | IBDN | Existing in IDF 30118 |
| Belden | 1RU Fiber Optic Enclosure | IBDN | Existing in IDF 30118 |
| Belden | OM4 6 strand multimode fiber, multimode patch cord with push-pull strain relief boot and duplex clip. | IBDN | From Security closet 30314 to IDF 30118. Provide material: Enclusure, SC connectors, Patch cables, etc. |
| Belden | 24-port flush mount patch panel supplied with rear mounted faceplates. | IBDN | |
| Belden | 48-port flush mount patch panel supplied with rear mounted faceplates. | IBDN | |
| Panduit or equal | Horizontal Cable Manager High Capacity Front and Rear 2 Rack Units. 3.5"H x 19.0"W x 13.1"D | NMF2 or equal | |
| Panduit or equal | High Capacity Dual Sided Vertical Cable Managers | Panduit PRV6 & PRV10 | Existing in IDF 30118 |
| Belden | Category 6 UTP, plenum (CMP), 4-pair, conductors are 23 AWG | IBDN | |
| Belden | Category 6, RJ45, 8-position, 8-wire universal module. | IBDN | Blue |
| Belden | 4-port, single gang, with label windows | IBDN | To match Electrical outlets |
| Belden | 2-port, single gang, with label windows | IBDN | To Match Electrical Outlets |
| Belden | Category 6 Performance, patch cord Modular Plugs on each end | IBDN | Provide two for each terminated drop in IDF, provide one 5' and one 7' patch cable. Provide two for each terminated work station outlet provide one 10' and one 14' |
| | | | |

**END OF SECTION**

**SECTION 27 41 16 - INTEGRATED AUDIO-VIDEO SYSTEMS AND EQUIPMENT**

CONDITIONS OF THE CONTRACT AND DIVISION 1, as applicable, apply to this Section.

PART 1 – GENERAL

1.1 RELATED WORK

A. 26 05 00 – Grounding and Bonding

B. 26 05 29 – Electrical Hangers and Supports

C. 26 05 33 – Raceway and Boxes

D 27 10 00 – Structured Cabling System

F 27 40 00 - Cable Television Distribution

1.2 DESCRIPTION

A. Summary of Work:

1. Provide a complete and tested integrated audio visual system in various spaces. The

Audio Visual (AV) system shall include:

a. AV Contractor to provide and install all cable and components designated on the project drawings and within this specification section to furnish a complete audio visual solution. Each space shall have a fully integrated audiovisual solution. Unless noted otherwise.

b. Each court room shall have the following:

i. (5) 21.5” Touch monitors with annotation capabilities
   1. Podium
   2. Defense
   3. Prosecution
   4. Witness
   5. Judge

ii. (7) Microphone
   1. Podium
   2. Defense
   3. Between Defense & Prosecution
   4. Prosecution
   5. Witness
   6. Judge
   7. Court reporter

iii. (1) 79” Flat screen display for Jury viewing

iv. Audio and video connectivity at the podium
   1. Podium with rack mounting
   2. Touch panel control
   3. Presentation switcher

4. Cable cubby
5. Power Conditioner
6. Inputs audio and video
    a. Table top connectivity
    b. Barco Click Share
    c. Document camera
    d. Local PC
    e. DVD player
    f. Input & output video conference with mic connection
    g. Local monitor
    h. Microphone

v. Audio and video connectivity at the AV closet
1. AV Rack
2. Annotation with printing capabilities
3. Audio / Video switcher
4. Audio DSP
5. Audio Amplifier
6. AV Controller
7. Power Conditioner
8. Inputs audio and video
    a. Table top
    b. Document camera
    c. Local PC
    d. DVD player
    e. Video conference with mic connection
    f. Local monitor
    g. Microphone

vi. Ceiling Speakers
vii. Sound masking
viii. Audio & Video mute mushroom button and touch panel at Judges desk
ix. Touch panel controller at Judges desk
x. USB, XLR and 3.5 audio connectivity from Judges desk to court reporter floor box.
xi. Assisted audio for ADA
xii. Digital signage display outside each courtroom. Match existing.

2. The installation shall comply with all applicable codes and standards in effect at the job site and as indicated in the Drawings and Specifications.

3. The installation shall comply with ISO 9001 - AV9000. AV9000 compliant report is required.

4. Reference project drawings for locations, quantities unless specified herein, and coordination with other trades.

1.3 QUALITY ASSURANCE

A. Installer Qualifications:

1. The contractor providing and installing the integrated audiovisual systems and associated infrastructure shall be an authorized dealer of the specified projector manufacturer and be capable of providing the manufacturer's maximum available product warranty.
2. The contractor job supervisor / project manager shall have an Infocomm CTS and / or CTSD. Contractor's on-site CTSD supervisor shall review, approve and sign off all submittal documents
3. All individuals installing the audio-video system must be employees of the authorized dealer and at least 75% of the installing staff shall have undergone a training class given by the manufacturer. Current certification indicating the successful completion of the training course shall be available upon request at the project and submitted in the contractor's product submittals.
4. The proposing contractor and the installing contractor must be the same company. No subcontractor to the proposing audio-video contractor will be allowed for any portion of the audio-video scope of work.
5. The Projector System Installer shall meet all applicable regulations of the State of Texas and Department of Labor insofar as they apply to this type of system. The bidder shall be a firm normally employed in the audio-video industry and shall provide a reference list of ten (10) projects of equivalent size or larger and contact names confirming successful completion of projection system installations.
6. The bidder shall have an authorized service center within 75 miles of the project's location for the brand of equipment that is submitted for bid. The owner reserves the right to perform an on-site inspection.
7. The bidder must produce a letter from the manufacturer guaranteeing the delivery of all the equipment outlined in the specification herein.
8. The bidder shall have a full time local service personnel capable of servicing the projector system described herein.

B. Pre-Construction Meeting:
1. The successful Contractor shall attend a mandatory pre-construction meeting with individuals deemed necessary by the Owner's representative prior to the start of the work.
2. The contractor shall provide a mock up of the complete integrated audiovisual system solution for each of the typical spaces below before implanting the installation in multiple like rooms. Mock up shall include all products listed in part 2 of this specification. Coordinate with G.C., Architect, Engineer, and Owner for scheduling and location of mockup.
3. All proposing contractors must have ability to demonstrate a/v system being proposed and provide owner with completely installed system to evaluate performance and operation.

C. Acceptance:
1. The Owner's representative reserves the right to reject all or a portion of the work performed, either on technical or aesthetic grounds.

D. Warranty:
1. The selected system installer shall be factory authorized service center and shall provide an end-to-end performance warranty of not less than one (1) year. The proposer shall provide current certification documentation. The performance warranty shall be

issued by the manufacturer and shall warrant that video projection system projectors have been tested to the district's approval. This end-to-end warranty shall cover the labor associated with removing/reinstalling any associated hardware or equipment as well as the replacement of all defective equipment or hardware.

2. The bidder shall also submit with the materials mentioned in section 1.5 submittals of this specification a written explanation outlining the terms and conditions of product warranty of all parts and service of the integrated a/v solutions.

## 1.4 REGULATORY REQUIREMENTS

A. Standards: All work shall be performed in accordance with the latest revisions of the following standards and codes:
   1. Latest Local Codes and Amendments
   2. 2008 National Electrical Code

B. Other References:
   1. TIA/EIA-568-A Commercial Building Telecommunications Wiring Standard
   2. EIA/TIA-569 Commercial Building Standard for Telecommunication Pathways and Spaces.
   3. TIA/EIA-606 The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings.
   4. TIA/EIA-607 Commercial Building Grounding and Bonding Requirements for Telecommunications.
   5. EIA/TIA 455-A Standard Test Procedure for Fiber Optic Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices and Other Fiber Optic Components.
   6. TIA/EIA TSB 67 Transmission Performance Specification for Field Testing of Unshielded Twisted-Pair Cabling Systems.
   7. TIA/EIA TSB 72 Centralized Optical Fiber Cabling Guidelines
   8. ISO/IEC 1180 Generic Cabling Standard
   9. EN 50173 Generic Cabling Standards for Customer Premises
   10. ANSI/EIA/TIA 526-14 Optical Power Loss Measurements of Installed Multimode Fiber Cable Plan.

C. Governing Codes and Conflicts:
   1. If the requirements of these specifications or the Project Drawings exceed those of the governing codes and regulations, then the requirements of these specifications and the Drawings shall govern. However, nothing in the Drawings or Specifications shall be construed to permit work not conforming to all governing codes and regulations.

## 1.5 ABBREVIATIONS

A. The following abbreviations are used in this document:
   CMP Ceiling Mounted Projector

PS Presentation Station
FS Flat Screen/monitor
Owner Fort Bend County Justice Center

1.6 SUBMITTALS

A. Project Initiation:

1. Within fourteen (14) days of Notice to Proceed, the projection system installer shall furnish the following in a single consolidated submittal:
   a. Permits: The Contractor shall obtain all required permits and provide copies to the Owner/Architect/Engineer.
   b. Product Literature: Complete manufacturer's product literature for all LCD monitors, projectors, mounts, projector bracket, speakers, amplifiers, cable, cross-connect blocks, cable supports, cable labels, outlet devices, and other products to be used in the installation. In addition, whenever substitutions for recommended products are made, samples (when requested by the Owner/Designer) and the manufacturer's supporting documentation demonstrating compatibility with other related products shall be included.
   c. Construction Schedule: A time-scaled Construction Schedule, using PERT/CPM, indicating general project deadlines and specific dates relating to the installation of the cable distribution system.
   d. Testing: Proposed Contractor test result forms, and a list of instrumentation to be used for systems testing.
   e. The contractor shall provide a letter from the manufacturer stating that the dealer is an authorized service center.
   f. The resume and contact information of the full time service personnel responsible for the installed projection system.
   g. Specification Compliance: A letter shall be provided stating, by section and subsection, that the installer complies with the ENTIRE specification section. If the installer intends to deviate from any portion of the specifications, a detailed explanation of reason in which the installer would like to deviate shall be provided in addition to the specification compliance letter. NO DEVIATIONS SHALL BE ACCEPTABLE UNTIL THEY HAVE BEEN ACCEPTED BY THE PROJECT'S TECHNOLOGY CONSULTANT.
   h. Certifications: The contractor shall submit all of the following certifications and the certifications must contain dates which are valid from the date of proposal and not expirer any sooner than 12 months after substantial completion of the project.
      1 Authorized dealer certification or
      2 Installer training certification
      3 Infocomm CTS or CTSD
   j. Programming:
      1. Provide any and all possible control functionalities based on project drawing and specifications.
      2. Provide PC based / Ethernet control for all programmed interfaces and room systems
      3. Provide screen shots / templates and a narrative description of all "Basic User Interfaces" and hidden "Admin Interfaces" functionality. Contractor must have written approval of control lay-out and

functionality prior to installation of programming. Provide Owner with a full functioning control system.

4. See section 3.5 – D – 1 for additional requirements.

k. Installed cost for each of the products listed in Part 2 of this specification to be used as pricing for any add or replacement of a part of the system the district may deem necessary during the construction or maintenance periods.

l. Pricing Forms: Contractor shall submit completed pricing form that includes an itemized listing of all equipment, materials and labor required for the installation of the system as specified herein for Change Order pricing. The listing shall contain: item description, item model number, quantity, unit cost and extended labor, material and installation cost required to provide a complete and functional system.

m. Provide pricing for service agreements for maintenance and repairs for 1, 3, and 5 years AFTER 1st year warranty/repair/ and service period.

n. Provide pricing for service agreement for additional training on a per visit basis.

o. Provide specification with line by line acknowledgement of compliance.

B. Shop Drawings:

1. Submit the following items, for Owner review and approval, within twenty-eight (28) days of notice to proceed:

a. Proposed wiring and connectivity diagram of the proposed audio video system including all integrated components, faceplates and sound reinforcing equipment.

b. In addition to the wiring/connectivity diagram, the submitted drawings shall indicate the following:

1 Audio Schematic
2 Video Schematic
3 Control Schematic
4 EDID Management Table / Deployment
5 DSP structure / layout
6 Location of cabling for all equipment (quantity or labeling cables)
7 Conduit routing, size, quantity, and stub-up locations for all floor mounted outlets.

c. Drawing Compliance: A letter shall be provided stating that the installer complies with the ENTIRE project drawing, including all general, keyed, and notes to contractor. If the installer intends to deviate from any portion of the specifications, a detailed explanation of reason in which the installer would like to deviate shall be provided in addition to the specification compliance letter.

NO DEVIATIONS SHALL BE ACCEPTABLE UNTIL THEY HAVE BEEN ACCEPTED BY THE PROJECT'S TECHNOLOGY CONSULTANT.

C. Project Completion:

1. As a condition for project acceptance, the Contractor shall submit the following for review and approval:

a. Samples: Complete manufacturer's product literature and samples (if requested) for all pre-approved substitutions to the recommended products made during the course of the Project.
b. Inspection and Test Reports: During the course of the project, the Contractor shall maintain an adequate inspection system to insure that the materials supplied and the work performed conform to Contract requirements. The contractor shall provide written documentation that indicates that materials acceptance testing was conducted as specified. The Contractor shall also provide documentation, which indicates that all cable termination testing was completed and that all irregularities were corrected prior to job completion.
c. Operating and Maintenance Instructions: Operating and maintenance instructions for all devices within the system. These instructions shall reflect any changes made during the course of construction, and shall be provided to the Owner for their use in a three-ring binder labeled with the project name and description (4 copies).
d. Provide schematic line diagram of system components as deployed in each installation.
e. All audio video system software programming (Crestron, QSYS etc), shall be created from new. All programming files shall become the property of Fort Bend County Justice Center upon project handover. All system passwords shall be provided to the Fort Bend County Justice Center, with no exceptions.

## PART 2 – PRODUCTS

### 2.1 GENERAL

*ALL PRODUCTS LISTED IN THIS SECTION SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. UNLESS NOTED OTHERWISE.*

A. Installation: The cabling shall be installed per requirements of the manufacturer and the Project Documents utilizing materials meeting all applicable TIA/EIA standards. The Contractor is responsible for providing all incidental and/or miscellaneous hardware not explicitly specified below as required for a complete and operational system.

B. Materials: Materials shall be as listed or shall be approved equivalent products of other manufacturers meeting the intent and quality level of the TIA/EIA specifications. All approved equivalent products will be published by addendum ten days prior to proposal for Architect/Engineer to review.

C. Testing: All installed cabling shall be tested 100% good after installation by the Contractor.

D. Ratings: All products shall be new and brought to the job site in the original manufacturer's packaging. Electrical components (including innerduct) shall bear the Underwriter's Laboratories label. All communications cable shall bear flammability testing ratings as follows: CMP Plenum Rated Communications Cable

E. Initial Cable Inspection: The Contractor shall inspect all cable prior to installation to verify that it is identified properly on the reel identification label, that it is of the proper gauge, containing the correct number of pairs, etc. Note any buckling of the jacket that would indicate possible problems. Damaged cable or any other components failing to meet specifications shall not be used in the installation.

F. Cable Lubricants: Lubricants specifically designed for installing communications cable may be used to reduce pulling tension as necessary when pulling cable into conduit.
1. Approved Products
    a. Twisted-pair cable: Dyna-Blue
    b. American Polywater

G. Fire Wall Sealant: Any penetration through firewalls (including those in sleeves) will be resealed with an Underwriter Laboratories (UL) approved sealant.
1. Approved Products
    a. 3M or
    b. Pre-approved equal

H. Acceptable manufacturers:
1. The equipment/products described herein, and furnished per these specifications shall be the product of the manufacturers listed. All references to model numbers and other detailed descriptive data are intended to establish standards of design performance, and quality, as required. The audiovisual integrator can propose alternate materials and system design so long as the above mentioned design criteria and functionality is met.

2. Audio / Video Switchers / Scaler
    a. Crestron Electronics
        1. Master quote 1042955
    b. Or approved equal

3. Audio / Video Transmitters / Receivers
    a. Crestron Electronics
        1. Master quote 1042955
    b. Or approved equal
4. Annotation System
    a. Pointmaker
        1. Provide Line driver
        2. USB extender per touch monitor
    b. Or approved equal

5. Audio / Video Collaboration
    a. Barco Click-Share
        1. CSC-1
    b. Or approved equal

6. Audio / Video Control Systems
    a. Master quote 1042955
    b. Or approved equal

7. Assisted Sound 70V
    a. Williams Sound FM
        1. Extended antenna
        2. All associated material
    b. Or approved equal

8. Sound Amplification 70V
    a. QSC
        1. SPA-60
            a. Provide (1) channel per zone
            b. Or approved equal

9. Digital Sound Processor (DSP)
    a. QSC Q-Sys
        1. Core 110f
            a. Provide audio connectivity for all device outlined in this specification and Audio video drawings. Provide 20% spare inputs and outputs.
            b. Provide sound masking for each zone. (Judge touch panel control.) Provide a stepping volume ramp.
    b. Or approved equal

10. DVD
    a. Sony
    b. Or approved equal

11. Document Camera
    a. Elmo
        1. P30HD
    b. Epson
    c. Or approved equal

12. Speakers
    a. Atlas AC-C4T
    b. Or approved equal

13. Microphone
    a. Shure
        1. MX418S/C
            a. (Prosecution, Between Prosecution / Defense, Defense, Podium, Witness, Court Recorder, and (1) spare)
        2. MX418 D/C
            a. (Judge)
        3. MX392/O
            a. (Spare)
            b. 15’ Cable for each mic
            c. Or approved equal

14. Flat Screen

a. 79” LG UHD with SurgeX SA82 (FS)
b. 21.5” Dell S2240T Personal Monitor with SurgeX SA82 (PM)(LM)
c. Or approved equal

15. Flat Screen Mounting
    a. Chief MFG
        1. PAC501B
        2. PNRIWUB
    b. Or approved equal

16. Podium with AV Rack
    a. Sound-Craft
        1. MMR36V – 36” Wide Chamberlin
        2. EAMNT - Arm monitor mount
        3. CPO - Cable port arm
        4. CWS – Sloped work surface
        5. CCO - Cut out for control / cable cubby
        6. FDCS-MML - Doc Cam Shelf
        7. RM16 – 16RU Rack space
        8. CF – Cooling fan
        9. LOGO – Fort Bend County Seal
        10. Wire Management Provide proper lacing bars with velcro ties for cable management.
        11. APC Vertical Plug Strip: Grounded receptacles, the full height of rack
        12. All equipment must be properly rack mounted. Otherwise provide U3 Shelve or custom
        13. SurgeX SEQ
        14. Misc accessories hardware and materials
    b. Or approved equal

17. AV Rack
    a. Middle Atlantic
        15. (1) WRK-37-27 with rear rail kit
        16. Blank Panels
        17. Wire Management Provide proper lacing bars with velcro ties for cable management.
        18. APC Vertical Plug Strip: Grounded receptacles, the full height of rack
        19. Service Light: At top rear of rack with an adjacent control switch
        20. Casters: Sufficient to provide mobility in the event of service
        21. All equipment must be properly rack mounted. Otherwise provide U3 Shelve or custom
        22. Thermal Cooling (UQFP-4DRA)
        23. SurgeX SEQ
        24. Misc accessories hardware and materials
    b. Or approved equal

18. AV Plate Connectivity
    a. Crestron Electronics
    b. Panel Crafter

c. All plate must be engraved
d. Or approved equal

19. AV Patch Cables
    a. Crestron Electronics
    b. Or approved equal
        1. Minimum 12’ Cables
        2. Provide AV patch cables for all AV plates and interconnectivity location.
        3. Provide all hardware with proper patch cables
        4. Provide 20 spare of each connectivity type used
            I. HDMI
            II. HDMI to DVI
            III. VGA with 3.5 Audio
            IV. Right & Left RCA
            V. 3.0 USB
            VI. 3 Pin XLR
            VII. Verify for additional connectivity types

2.2 CABLES

A. All AV is to be provided by AV Contractor.

B. Provide types and quantities per drawings and schedules

C. Testing: All installed cabling shall be tested 100% good after installation by the Contractor.

D. Conductor Sizing:

1. Insulation shall be rated for a minimum of 300 volts.
2. Wire types and minimum sizes:
    a. 70 Volt Speaker Cable - 16 AWG, twisted, stranded CL2/CL2P.
    b. Low Impedance Speaker Cable – minimum 12 AWG, twisted, stranded CL2/CL2P.
    c. Microphone Level Cable - 22 AWG, with 22 AWG drain wire, shielded, twisted, stranded CL2/CL2P.
    d. Line Level Cable - 22 AWG, with 22 AWG drain wire, shielded, twisted, stranded CL2/CL2P.
    e. Low Voltage Control Cable –CL2/CL2P.

E. Minimum acceptable AVS systems wiring performance standards shall be as follows:

1. Speaker cable - Per ANSI WC57 standard test.
2. CAT-5/6 - Per ANSI/TIA/EIA-568-8.1 standard test.
3. Fiber optic cable - Per ANSI/TIA/EIA-568-B standard test.
4. RS 232 - Per ANSI/ WC66 standard test.
5. Line level shielded audio cable - Per ANSI WC66 standard test.
6. Microphone level shielded audio cable - Per ANSI WC66 standard test.
7. Video coax cable - Per ANSI/TIA/EIA–TSB-67standard test.

8. Multi-conductor control cable - Per ANSI WC57 standard test.
9. Manufacturer proprietary
    a. Crestron
    b. Qsys

2.3 CABLE ROUTING/PATHWAY

A. Cable Support System: All audio-video cabling shall be installed and supported using a PANDUIT® Corp. J-MOD™ modular cable support system at 4'-0" intervals unless installed in conduit. Do not exceed manufacture recommendation for the quantity of cables supported in an individual support.

B. All cable bundles shall be grouped together using plenum rated Velcro for the entire run above and below the ceilings.

PART 3 – EXECUTION

3.1 GENERAL

A. Contractor is required to properly mount integrated A/V solutions and connect all ceiling video/audio cables to projector component inputs.

B. Contractor is required to thoroughly test and verify operation of all A/V inputs and video modes prior to project completion.

C. Contractor is required to focus and adjust projector to properly project image on viewing surface (screen or multimedia board depending on location).

D. Contractor shall provide owner with written verification test process and results once all projectors have been installed, tested, and placed in final condition.

E. Damage:
    1. The Contractor shall replace or rework cables showing evidence of
    Improper handling including stretches, kinks, short radius bends, over tightened bindings, loosely twisted and over-twisted pairs at terminals and cable sheath removed too far (over 1-1/2 inches).

F. The Contractor shall replace any damaged ceiling tiles that are broken during cable installation.

G. Clean Up:
    1. All clean up activity related to work performed will be the responsibility of the Contractor and must be completed daily before leaving the facility.

3.2 DOCUMENTATION

A. Contractor shall provide owner with detailed serial number listing and associated graphical room number designation equipment was installed. Contractor shall use actual graphical package room numbers not architectural plan numbers from construction set.
B. Contractor shall provide one line connectivity diagram for all AV solutions in O&M Manuals.
C. Contractor shall provide a quick reference book per room illustrating device connectivity and user instructions

## 3.3 STATION WIRING INSTALLATION

A. General:
1. All cable must be handled with care during installation so as not to change performance specifications. Factory twists of each individual pair must be maintained up to the connection points at both ends of all category 6 cable. There shall never be more than one and one-quarter inch of unsheathed enhanced Category6 UTP cable at either the wiring USB Transmitter or Receiver.

B. Exposed Cable:
1. All cabling shall be installed inside walls or ceiling spaces whenever possible. Exposed station cable will only be run where indicated on the Drawings. Additional exposed cable runs will require Owner approval, and will only be allowed when no other options exist.

C. Placement: All cabling and associated hardware shall be placed so as to make efficient use of available space. All cabling and associated hardware shall be placed so as not to impair the Owner's efficient use of their full capacity.

D. Cable Routes:
1. All cabling placed in ceiling areas must be in conduit, cable tray or PANDUIT® Corp. J-MOD™ modular cable support. Cable supports shall be permanently anchored to building structure or substrates. Provide attachment hardware and anchors designed for the structure to which attached and that are suitably sized to carry the weight of the cables to be supported. Do not route cable through webbing of structural steel. Cabling must be supported in dedicated supports intended to support cabling as described in this section. Contractor shall adhere to the manufacturer's suggested fill ratio for each size cable support installed.
2. Attaching cable to pipes or other mechanical items is not permitted. Communications cable shall be rerouted so as to provide a minimum of 18 inches spacing from light fixtures, sources of heat, power feeder conduits and EMI sources. Cabling shall not be attached to ceiling. Grid support wires. Cable runs shall be routed down the corridors; parallel or perpendicular to building structure. Multiple cables to be bundled together at and between each cable support installed.
3. Contractor shall be responsible for coordinating with other trades on the project so that the installed cable pathway does not interfere with the installation of other systems to insure that mechanical ducts, pipes, conduits, or any other above ceiling systems are not putting unnecessary stress on any portion of the install audio-video cabling.

## 3.4 STATION HARDWARE

A. Flush mounted components: all component shall be inserted to a flush mounted faceplate unless designated otherwise.

B. Placement: Where possible, the 'PS' outlets shall be located in floor boxes.

3.5 FINAL TESTING REQUIREMENTS

A. Notification: The Owner and Engineer shall be notified one week prior to any testing so that the testing may be witnessed.

B. Inspection report per ISO AV9000: Before requesting a final inspection, the Contractor shall perform a series of end-to-end installation performance tests. The Contractor shall submit for approval a proposal describing the test procedures, test result forms and timetable.

C. Procedures: Trained personnel shall perform all testing. Acceptance of the test procedures discussed below is predicated on the Contractor's use of the recommended products and adherence to the inspection requirements and practices set forth. Acceptance of the completed installation will be evaluated in the context of each of these factors.

D. Programming:

1. Coordinate with Owner to develop basis and admin for control system GUI "look and feel" for all A/V room types. but not limited to:

    a. Security numeric keypad per user type.
    b. Basic user functionality (No more than 3-4 button pushes to complete task).
    c. Admin functionality (Hidden Independent device Switching, control, Gain control, Status review etc.).
    d. GUI, Layout (Prepare proper lay-out and color contrast for color blindness.)

1. Coordinate and verify all AV programming with Owner and or Owner representative prior to installation.
2. Final programming A/V source code to remain property of Owner. Provided copies of all A/V room types compiled and uncompiled source code, to Owner for backup and future reference as part of the Final Acceptance.
3. Owner may use AV control system up to warranty period of (1) year after substantial completion Contractor must provide the Owner (1) final programming change to any aspect of the AV control systems including, but not limited to:
    a. Touch Panels
    b. Key Pads
    c. Audio
    d. Video
    e. Gains
    f. Curves / filters, etc.
    g. Functionality
    h. Control
    i. Lay-out
    j. Added equipment

E. SPEAKER SYSTEM:

1. Equalize speaker systems flat from 80 Hz to 2 KHz with a 2dB per octave roll-off thereafter. Program a high pass filter at 60Hz with 12dB per octave roll off and a low pass filter 15 KHz with 12 dB per octave roll off.
2. Use a minimum of three measurement locations in the system's intended coverage area to calibrate the system response.
3. Verify system gain and amplifier levels.
4. Verify speaker polarity
5. Adjust appropriate speaker delays
6. Set and adjust limiters.
7. Contractor shall provide for calibration of the system:

    a. Sound analyzer (SmartLive, TEF SoundLab, Meyer's SIM or equivalent) with trained operator for adjusting and verifying delay timing, cabinet aim and equalization.
    b. Suitable calibrated microphone.
8. The Contractor shall coordinate this testing and calibration. It is anticipated that this work will take 1-3 hours for the Board room. It will be necessary to have a quiet room during these times.
9. Contractor to record all measurements, settings and adjustment for inclusion in the O&M manuals.

10. Adjust limit switches on electric operated projection screens.

11. Adjust back focus on all video cameras.
12. Occupancy Adjustments: When requested within 12 months following the of date of Substantial Completion, provide on-site assistance in adjusting systems to suit actual occupied conditions and to optimize performance of the installed equipment. Tasks shall include, but are not limited to, the following:

    a. Check cable connections.
    b. Check proper operation of equipment.
    c. Adjust all presets; consult Owner's personnel.
    d. Recommend changes to the AVS to improve Owner' utilization of the system.
    e. Provide a written report of adjustments and recommendations.

## 3.6 OWNER TRAINING AND DEMO

A. A/V integrator shall provide demonstration of all integrated a/v solutions to owner's staff that have any stake with the operation and maintenance of the a/v solutions. Integrator shall produce sign in sheets for record of who was trained and when. Copies of sign in sheets shall be submitted with close out paper work. Coordinate training dates with owner at project completion.

B. Integrator shall provide factory training for owner's operations and maintenance personnel for each major component of the systems listed in the A/V solutions outlined in part 2 of these specifications. Training shall be a minimum of 4 hrs. per person. Re-training of staff shall be available, at no cost to the owner, to a maximum of 3 on-site training sessions up to 1 year from the date of project competition. AV Integrator shall include in their base proposal monthly

service and training visit to site for 1st year after project completion **All training must be video recorded by the contractor and a copy provided to the owner.**

C. A complete operation and maintenance manuals and preliminary as-built drawings shall be delivered to the Owner one week prior to the training sessions.

1. Provide custom system specific printed reference material for each trainee that documents and explains in layman's terms: a. System block diagram.
   a. Normal day-to-day operation.
   b. Operator selectable features.
   c. Provide a hands-on training with Q & A session.

D. Provide and review a custom, system specific, quick reference guide for the inexperienced operator.

**END OF SECTION**

**SECTION 28 00 00 - ELECTRONIC SYSTEMS GENERAL REQUIREMENTS**

## PART 1- GENERAL

### 1.1 DESCRIPTION

A. General:

1. Furnish all labor, materials, tools, equipment, and services for all electronic systems work as indicated, in accord with provisions of Contract Documents.
2. Completely coordinate with work of all other trades.
3. All security installation shall be coordinated with Fort Bend Facilities Electronic Lead.
4. Security contractor shall be Pelco Endura certified. All IP security camera servers and storage are existing. Provide Cameras and programming.
5. Security contractor to provide full functioning access control system with all required hardware, software, PC /servers etc.
6. Security contractor to provide building intercom system for integrated intercom system with detention grade hardware, intercom, duress, etc.
7. Security contractor to provide local intercom system for standard door station, master station video with door release.
8. All Electronic control head-end system, Intercom, Camera storage, Security system servers are existing. Except access control.
9. Security contractor to tie into existing Wanderware system. All Panic buttons, Intercom, Access control, Camera integration and control station integration shall be programed by MCS / Argyle only. Programming shall be part of this contract.
10. Contractor shall test and correct programming for ADS and back up disk image for each control station.
11. All security data cabling routed to or from the security closet 30314 shall be landed on a patch panel in the existing cabinet>
12. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.
13. Division 28 specifications may require hardware and or software etc that is not required for security integration with existing security systems.
14. See Division 1 for General Requirements.

B. Drawings use and interpretation:

1. Drawings are diagrammatic and indicate general arrangement of systems and equipment, except when specifically dimensioned or detailed.

2. For exact locations of building elements, refer to dimensioned architectural/structural drawings.

3. Field measurements take precedence over dimensioned drawings.

4. Intention is to show size, capacity, approximate location, direction and general relationship of one work phase to another, but not exact detail or arrangement.

5. Field verify locations and arrangement of all existing systems and equipment.

6. Where ambiguity may exist between specifications and drawings, the most stringent shall apply.

C. Installation of all systems and equipment is subject to clarification as indicated in reviewed shop drawings and field coordination drawings.

D. Dimensions indicated anywhere are limiting dimensions.

E. Do not use equipment exceeding dimensions indicated or equipment or arrangements that reduce required clearances or exceed specified maximum dimensions.

F. Description of systems: Furnish and install all materials to provide functioning systems in compliance with performance requirements specified and any modifications resulting from reviewed shop drawings and field coordinated drawings.

G. Furnished by Electronic Systems Integrator, for installation by Division 26 :

1 Non standard electrical boxes.

H. Furnished and Installed by Electronic Systems Integrator:

1. Intercom and Paging Systems: Section 28 51 23.

2. Cabinets and Enclosures: Existing system.

3. Electronic Control System: Section 28 40 00.

4. Touch Screen Control and Management System: Existing system.

5. Access Control System: Section 28 13 00.

6. Video Surveillance System: Section 28 28 73 30.

7. Cable and Wire

I. Electrical Furnished and installed by Division 26
II. Data Furnished and installed by Division 27 :

1. Complete raceway system from the main head end equipment to the end device, including any necessary standard size backboxes, wireways and pull boxes. Install pull string in all conduits.

2. All 120 volt AC wiring and connections for power panels and/or terminal strips in electronic panels, cabinets, enclosures or consoles.

3. All 120 volt AC wiring, devices and connections for devices and equipment as indicated on drawings.

4. The Electronic Systems Integrator shall furnish conduit requirements and special back-boxes to the Division 26 installer in a timely manner so as not to impede the progress of the work. Conduit sizing shall allow for a maximum conductor fill of 40 percent of conduit cross sectional area.

5. The Electronic Systems Integrator shall be responsible for any additional conduits required (not shown on drawings) or increase in size of conduit to effect the installation of the security system contained herein.

J. Alternate Bids: (See Section 01030)

1. The work includes that governed by Alternate bids as described in Division 1.

2. When providing Alternate Bids, include all ancillary costs to increase, modify, or delete the work as described. Do not reduce the overall system capability unless specifically described to do so. As example, deletion of cameras does not include reduction of video inputs of switching system unless specifically noted as such.

3. Alternate Bids within the Electronic Security Systems include the following. Other Alternate Bids may affect the work of this division. Review all Alternate Bid descriptions and include costs for such work as it relates to the work specified herein.
   a. Alternate Bid #1: Build out two shelled courtrooms on the third floor. Install elevator to serve the holding area for these courts.
   b. Alternate Bid #2: Build fourth level of the parking garage, extend stairs, add screens to two sides
   c. Alternate Bid #3: Build the landscape and hardscape to the North of the ring road.
   d. Alternate Bid #4: Build the concrete parking lot to the North of the ring road.
   e. Alternate Bid #5: Omit the metal screen roof from the concrete pedestals and anchor bolts up.

K. Related work:

1. Division 8. a. Commercial Door Hardware: Div 8

2. Division 11. a. Detention Equipment doors, frames and hardware: Div 11.

3. Division 14. a. Elevator cabs, controls and traveling cables: Div 14

4. Division 26 a. Raceway systems Products and Execution: Sections Div 16

## 1.2 BASIS OF DESIGN

A. The electronic security system described within the specifications and drawings shall function as an integrated system. Although the system is made up of several sub systems, they shall be integrated in both physical and electronic manner to achieve a single system presentation and functionality to the operator. The control stations shall function as a single control point, appearing to function as a single system.

B. The integrated system is made up of several subsystems that communicate with each other via a fault-tolerant, self-healing network. The network is Ethernet based with primary controlling systems connected to the managed network switches. The network switches will direct all communications to and from all devices connected to the systems.

1. Control of door locks, lights, receptacles, etc. will be managed via distributed programmable logic controllers (PLC). Programmable logic controllers are located in electronic security equipment room as indicated on the drawings. Each is connected to the Ethernet network and is capable of stand-alone operation in the event of network connection failure.

2. The intercom and paging systems switching will be part of the programmable logic controller system. Modular amplifiers, microphones, speakers and related equipment will be configured to provide communications to local staff stations and broadcast of messages. Speaker circuits will be relay switched under the instructions of the control system

3. Touch screen control and management system shall provide the means to control and monitor all security devices in the facility via the electronic control system. Additionally it shall provide archiving of events to a database with ability to generate reports from that database.

4. Control of devices such as lights, receptacles, etc. shall be provided via control relays. These control relays shall in turn operate line voltage relays or contactors provided under the Division 26 -Electrical work. Switching shall be controlled via the local control stations and the PLC

The access control system shall function as an independent system with respect to database and card management. Non-Detention doors will be controlled from the access control system. Detention doors and the doors to the courtrooms shall be controlled from the electronic control system (PLC) with secondary control provided by the access control system. The Electronic control systems shall monitor the status of the all doors. The Fort Bend Justice Center access control system shall be integral part of Owner's access control system (Infinias). Adding the Fort Bend Justice Center access control

system to the County's existing access control system shall be carefully planned and coordinated. The electronic security system integrator shall provide all necessary updates to existing software and hardware when needed to achieve a single system presentation to the operator(s). The electronic security integrator shall inform the Owner in the timely manner (21 days in advance) when the access control system is ready for network connection and integration with the existing system. The Owner will witness and assist the final system integration (network connection and all programming changes). The access control system installed at the Fort Bend Justice Center shall meet or exceed functionality and serviceability of the Owner's existing access control system.

6. The Video Surveillance System shall be Pelco, Endura IP network based digital video system. The system will utilize CAT6 and fiber optic cabling as a transmission to create a high performance recording and virtual matrix control system. The IP network based digital video system shall provide unlimited expansion capability for the addition or modification of video inputs. The System Manager shall provide a user interface and database management of the IP networked video surveillance system. The System Manager shall allow for users to be restricted via software to logical configurable groups of cameras, monitors and system operations

7. Miscellaneous devices (i.e. call buttons, duress buttons and duress receivers) shall be configured as inputs to the local PLC with status displayed on the touch screen stations.

C. The facility is to be provided with a Touch Screen Control and Management System for facility wide control and monitoring functions. This subsystem shall also provide system administration, archival, database management, and report generation. Touch screen station is provided in the Control room and other control locations as indicated on drawings. The system is provided with. All touch screen control stations in the facility will be connected to the Electronic Security Network which provides Ethernet connectivity for future technology upgrades and expansion. The system consists of two (2) ouch screen control station, an administration station, and a file server.

## 1.3 WARRANTY (SEE DIVISION 1)

A. See Division 1 for warranty requirements.

B. Manufacturer's warranties that extend beyond the requirements of Division 1 shall be maintained and transferred to the Owner.

C. Respond within four (4) hours to an emergency maintenance request. Provide a twenty-four hour telephone contact number (24 hours per day, 365 days per year). Service response time is defined as the period between the placing of a service request and established communications with the designated client representative. Emergency repair personnel shall be on-site within 24 hours of notification and repair or replacement of defective equipment shall be completed within 72 hours of notification.

D. Maintain a sufficient parts inventory during the warranty period to meet the anticipated system repair times. Contractor shall monitor spare equipment inventory and replenish materials used in an expedient manner

E. Prior to expiration of warranty, system integrator shall provide all software patches available from software supplier. Upon completion of installation, test affected systems to confirm operation. Software patches shall be installed at time convenient to Owner/User considering potential for security impact.

F. Perform a Full System(s) Test(s) two months prior to completion of the warranty period. Record test results and submit to User within 10 days after test(s). Provide 60 day notification of test in order for User to schedule accordingly. Warranty period shall be extended (at no additional cost to Owner) until such time that entire system(s) is fully operational and satisfactorily re-tested. Repair or replace all defective items prior to completion of the maintenance period. All spares will have be replenished and accounted for at this time by the contractor.

G. See individual sections for additional warranty requirements.

## 1.4 QUALITY ASSURANCE

A. Perform all work in accord with following codes and standards:

1. Codes Compliance: Comply with the following current adopted codes::
   a. Federal, state and local codes, regulations and ordinances.
   b. National Electrical Code (NEC), latest edition.
   c. National Fire Code (NFC)
   d. Occupational Safety and Health Act (OSHA).
   e. International Building Code (IBC)
   f. Factory Mutual System (FM) requirements.
   g. Texas Commission on Jail Standards.
   h. All authorities having jurisdiction.

2. Standards Compliance: Comply with the following standards as applicable:
   a. Americans with Disabilities Act (ADA)
   b. American National Standards Institute (ANSI)
   c. American Society for Testing and Materials (ASTM)
   d. Electronics Industry Association (EIA)
   e. Electrical Testing Laboratories (ETL)
   f. Factory Mutual (FM)
   g. Institute of Electrical and Electronics Engineers (IEEE)
   h. Insulated Cable Engineers Association (ICEA)
   i. National Electrical Contractors Association (NECA)
   j. National Electrical Manufacturers Association (NEMA)
   k. National Fire Protection Association (NFPA)
   1. Underwriters Laboratories (UL)

B. Equipment Manufacturer:

1. Regularly engaged in the manufacture of products specified.

2. Manufacturer of products specified for a period of no less than five years with satisfactory performance in similar applications.

C. System Integrator Personnel: (Project Manager, Project Engineer, On-site Supervising Technician)

1. Regularly engaged in installation of products specified.

2. Installer of products specified for a period of no less than five years with satisfactory performance.

D. Systems specified in this Division shall be engineered, assembled and installed under the direction of a pre-qualified electronic systems integrator. Electronic systems integrator shall meet the following minimum requirements.

1 Qualifications.
a. Successful completion of at least three (3) similar detention facilities which have been in successful operation for at least one (1) year.

b. Technical staff experienced and factory trained in systems specified.
c. The electronic systems integrator shall be bondable for an amount equal to 100% of his bid.

2. Pre-qualified electronic systems integrators.
a. ESI Companies, Inc., Memphis, TN.
b. ISI - Metroplex Control Systems, San Antonio, TX
c. Norment Security Group, Montgomery, AL.
d. Sierra Detention Systems, Golden, CO
e. Southern Folger Detention Equipment Company, San Antonio, TX

3. Electronic systems integrators must be pre-qualified to bid the project. Integrators not indicated but desiring approval shall submit information supporting compliance with the following minimum requirements.
a. Minimum five (5) continuous years in the business of installing electronic security systems in detention and or correctional facilities incorporating systems and equipment including but not limited to intercom/paging, programmable logic controllers, touch screen control, access control, and video surveillance systems.
b. Successful completion of at least three (3) detention facilities of similar size and complexity that have been in operation for at least one (1) year.
1) Successful completion shall be determined by information from references confirming project was not delayed by the completion of electronic security systems, electronic security systems were fully operational within 90 days of substantial completion and electronic security systems remained fully operational at conclusion of warranty period or two years whichever is greater.
2) Projects of similar size are represented by construction cost value in excess of one million and five hundred thousand dollars ($1,500,000.00).
3) Projects of similar complexity are represented by integrated systems including but not limited to intercom/paging, programmable logic controllers, touch

screen control, access control, and video surveillance systems operating in a network environment with a minimum five (5) equipment locations (nodes)

c. References: The Fort Band County and/or its representative(s) may at their own discretion contact references for projects in addition to those submitted by the applicant.

d. Definitions:

1) Similar Size: Detention Facility of...

a) similar dollar value of installed electronic security systems
b) similar duration (12 months)
c) similar systems technology

2) Similar Complexity: Detention Facility ...

a) using integration of multiple systems including video, communications, and control.

E. Termination, testing and start-up of electronic systems shall be done under the direct supervision of the system integrator. Prior to termination at system equipment, all field wiring shall be tested against faults, grounds and other conditions that may impede the proper operation of the system. System integrator shall verify and accept the field wiring prior to termination at system equipment. Beginning of termination constitutes acceptance of conditions as satisfactory.

## 1.5 SUBMITTALS (SEE OTHER DIVISION 28 SPECIFICATIONS FOR ADDITIONAL REQUIRMENTS)

A. Review of shop drawings or schedules by Engineer and Fort Bend Facilities Electronic Lead shall not relieve the Contractor from responsibility for deviations from drawings or specifications, unless there is a formal letter which called attention to such deviations at the time of submission and secured written approval; nor shall it relieve him from responsibility for errors in shop drawings or schedules.

B. Submittals for individual systems and equipment assemblies which consist of more than one item or component shall be made for the system or assembly as a whole. Partial submittals will not be considered. Partial submittals will not be returned except at the request and expense of the contractor.

C. The contractor shall develop and submit complete submittals and do so in a timely manner. By failing to do so, the System Integrator agrees to be fully responsible for any and all damages which might be occasioned by the contractor's failure to do so.

D. Where Engineer and Fort Bend Facilities Electronic Lead furnished electronic files of the Contract Documents are used as part of the shop drawings, the Electronic Systems Integrator shall review such files and confirm completeness and accuracy. Submission of such documentation as a part of the shop drawings shall be indication that such review and confirmation has been performed and completed. Submission and subsequent approval shall not relieve the Electronic Systems Integrator from the requirements of the Contract Documents.

E. All shop drawings shall be created using AutoCAD v2004 or later. Schedules shall be created in spreadsheet format using Microsoft Excel. Incorporate all revisions upon completion of work. Submit with record drawings in both hard copy and electronic files.

F. Resubmittal of items that have been previously accepted or approved will not be reviewed unless specific attention is called to changes in previously approved items. Resubmission that does not specifically call attention to previously accepted or approved submittals shall not be considered as subsequent approval of a change to the initially accepted or approved item.

G. Submit drawings, data sheets, schedules, and others, in compliance with Article "Submittal Requirements" of this Section to permit adequate time for review by the Engineer, but in not less than 14 calendar days. This 14 day review period is exclusive of time associated with travel, mail, delivery, copy, and handling. Due to the integrated system, most submittals are interrelated and thus are expected in Groups that are large and complex. Such submittals will require longer review periods. Time required will depend on scheduling, size and complexity of submittal

H. Provide information required for complete review of each item in one submittal. When individual sections of specifications require more than one item for review, such as shop drawings, product data, samples, and related items, submissions shall include all specified information delivered at one time.

1. Incomplete or partial submittals will not be reviewed by the Engineer and Fort Bend Facilities Electronic Lead.

2. Extra copies of submittals will not be marked or returned, except at the expense of the Contractor.

3. Duplicate copies of incomplete or partial submittals, or extra copies of submittals, will be discarded after 15 calendar days unless Contractor makes arrangement for return, at Contractor's expense.

4. Submittals not requested specifically may be returned to Contractor without review.

I Review of submittals shall be limited to two (2) submissions. The Engineer shall be compensated for additional reviews. In such an event, a change order to the General Construction Contract will be executed for compensation of the Engineer. The change order shall be executed prior to additional reviews.

J. Project Data: Electronic Systems General Requirements: Section 28 00 00.

1. System Integrator personnel qualifications: (Project Manager, Project Engineer, On-site Supervising Technician).

2. List of all manufacturers and equipment suppliers.

3. Submittal schedule: Schedule shall be submitted within 30 days of Notice to Proceed and shall include time and duration for product data by group, shop drawings by group, touch screen demonstration station, and testing procedures.

4. Functional block diagram of complete integrated system with references to all related sub-system drawings.

5. Floor plans indicating device locations and cable assignments/groupings. Submission of these plans indicates that the contractor has coordinated the placement of all devices with architectural plans, and coordinated raceway requirements with all related trades.

6. Drawings indicating complete conduit and raceway systems.

7. Spare parts inventory with quantity, description and source listed.

8. Testing: Provide complete testing procedure for electronic security systems. The procedure shall identify testing of each function of each device under each condition. Manufacturer recommended test procedures shall be incorporated into the testing procedure. All testing shall be project specific.

K. Transient Surge Protection: Section 28 00 00

1. Project Data: Submit material specifications and installation data for products specified herein.
   a. Include electrical characteristics, and ratings for each type of TSP equipment.
   b. Indicate wiring diagrams indicating internal connections of TSP components within each enclosure.
   c. Drawings shall be provided indicating unit dimensions, weights, mounting provisions, and connection details.
   d. Submittals of each system shall indicate location of TSP devices.

## 1.6 WEATHERPROOF EQUIPMENT AND LOCATIONS

A. Weatherproof equipment and locations are where weatherproof (WP) is indicated or where equipment is not located inside a building.

B. Enclosures and boxes to be NEMA 3R hot dipped galvanized steel, weatherproof cast iron or malleable iron boxes and covers, or NEMA 4X stainless steel.

C. Mounting and support hardware to be hot dipped galvanized steel or stainless steel.

## 1.7 PROTECTION

A. Provide covering and shielding for all equipment provided to protect from damage.

B. Protect nameplates on equipment, to prevent defacing.

C. Repair, restore or replace damaged, corroded and rejected items.

1.8 DELIVERY, STORAGE AND HANDLING:

A. Protect all materials and equipment from damage during storage at the site and throughout the construction period. Protect equipment and materials during shipment and storage against physical damage, dirt, dust, moisture, heat, cold, rain, and any foreign substances that may damage the equipment.

B. Prevent damage from rain, dirt, sun and ground water by storing the equipment on elevated supports and covering them on all sides with securely fastened protective rigid or flexible waterproof coverings.

C. Protect conduit by storing it on elevated supports and capping the ends with suitable closure material to prevent dirt accumulation.

D. Protect all fabricated and/or installed materials and equipment against dust, dirt, moisture, physical damage, metal debris and any foreign substances that may damage the equipment.

E. Protect painted surfaces with removable heavy Kraft paper, sheet vinyl or equal, installed at the factory and removed prior to final inspection.

F. Replace damaged equipment as determined by the Engineer. Repaint and finish damaged paint on equipment and materials with the same quality of paint and workmanship used by manufacturer so that repaired areas are not obvious.

1.9 OPERATING AND MAINTENANCE DATA (SEE DIVISION 1)

A. Provide the following for each electronic system:

1 Operations manual for all components and system as a whole.

2. Maintenance manual for all components and system as a whole.

3. Record Drawings.

4. Point-to-point diagrams, wiring diagrams and construction details.

5. List of spare parts, materials and suppliers of components. Provide name, address and telephone number for each supplier.

6. Emergency instructions for operational and maintenance requirements.

7. Copies of all warranties.

8. Delivery time frame for replacement of component parts from suppliers.

9. Recommend inspection schedule and procedures for all components and system as a whole.

10. Complete 'Approved' shop drawings and product data for all components and system as a whole.

B. Specific instructional material for this project.

1.10 JOB CONDITIONS

A. Cause as little interference or interruption of existing utilities and services as possible.

1. Schedule work which will cause interference or interruption in advance with Owner, Architect or Engineer, authorities having jurisdiction and all affected trades.

B. Examine Contract Documents to determine how other work will affect the execution of electronic systems.

C. Determine and verify locations of all existing utilities on or near site.

D. Make arrangements for and pay for necessary permits, licenses, and inspections.

E. Furnish conduit requirements and special backboxes for installation under Division 26 in a timely manner so as not to delay progress of the Work.

1.11 EQUIPMENT AND SYSTEM IDENTIFICATION

A. All electronic security systems and equipment shall be labeled for identification.

1. Install a nameplate on each individual equipment rack, enclosure, boxes, cabinet, and significant equipment item with text to coordinate with approved submittal documents.

2. Use identifiers and abbreviations defined in the Drawings whenever possible. Use plan designation for labeling, unless indicated otherwise.

3. Nameplates shall be laminated black phenolic resin with a white core and engraved lettering, a minimum of 1/4" high. Use fasteners to install nameplates. Do not fasten with adhesives.

4. Engrave using upper case letters of uniform height; centered on device, cover plate, or enclosure; with all characters made clearly and distinctly. Allow room for fastener attachment.

5. All equipment shall have the manufacturer's name, address, model number and rating on a nameplate securely affixed in a conspicuous place. All equipment shall bear labels attesting to Underwriters Laboratories approval where subject to Underwriters Laboratories label service.

6. Identify all field terminals and relays with device identification. Lettering shall be 3/16" high, minimum.

B. Raceway systems for electronic security systems shall be mark with paint at all pull points and on each side of wall penetration, but in no case less than 20 feet between labels. Identify raceways with paint mark. All pullbox covers shall be painted to identify the system contained. Coordinate paint color selection with colors being used by other trades.

1.12 RECORD DRAWINGS (SEE DIVISION 1)

A. The Electronic systems contractor shall keep a complete set of all electronic systems contract drawings and the electronic systems shop drawings in the job site office.

1. Use these sets of drawings for showing as constructed installation of electronics security systems and equipment.

2. Where any material, equipment, wiring or system components are installed differently from that shown, show such differences clearly and neatly using ink or indelible pencil.

3. At project completion, submit the record set of contract drawings to Architect (see Division 1).

4. At project completion, make corrections to the shop drawings on the original media and submit the corrected reproducible drawings to the Architect (See Division 1). Where the shop drawings were created on a computer aided drafting system, furnish AutoCAD compatible electronic drawing files of all corrected shop drawings.

B. Software Records:

1. Submit final software programs on electronic media compatible with the installed system.
   a. Transfer all software licenses to the Owner/User representative at the completion of the project. Transfer shall include customer support rights.

b. Fully comply with all license agreements for the installed software. Install sufficient quantities of each software program so that the Owner fully meets the intent of the publisher's site license agreement. When in doubt, contact the publisher for an interpretation and comply with that interpretation.
c. Provide the Owner with all original installation disks or CD-ROMs and all software manuals for every software program installed on the system.

2. Standard and Custom Application Software:
   a. Prepare and submit the licenses to all software installed for the system. Compile a list with each program name, its installed version number, the number of copies installed, the serial number of each copy, the publisher's name and address, and the publisher's customer support telephone number.
   b. Prepare and submit complete documentation of the final installed version of the application program, including a diagram of its component modules, subroutines, databases, libraries, drivers, and other parts. Narrative descriptions shall accompany the diagram, giving basic

descriptions of each component and describing the interaction between components. Provide a complete, annotated listing of all application settings.

3. User Data and User Programmable Software:
   a. Provide complete documentation of all user data and user programmable software, including but not limited to properties, preferences, settings, configurations, component modules, plug-in modules, user subroutines, databases, libraries, drivers, macros, templates, objects, slides, maps, images, sounds, icons, screen savers, and any other software files for each site.
   b. Provide narrative descriptions and diagrams that give basic descriptions of each software component and the interaction between software components. Provide a complete, annotated software component listing.
   c. Provide a CD ROM or equivalent media of the final operating version of the user data and user programmable software in accordance with Division 1 requirements. Provide three (3) copies of the media, properly labels and dated in hard cases.

4. Operators Guide
   a. Submit Operators Guide for approval 10 days prior to first phase of Operational Training.
   b. Operators Guide shall outline the operation of each system. A guide is to be kept at each workstation for reference on the operation of the equipment.
   c. Include written description in outline form how to operate the basics of the system. This shall include but not be limited to: access and control of individual devices, group control functions, emergency control functions, system acknowledgement and reset of alarms.
   d. Include 8.5 x 11 inch graphics as needed to identify device locations and facilitate understanding of the written description.
   e. Provide one copy for each work station and one master copy that may be reproduced by the County.
   f. Laminate each guide for each workstation, or other approved method.

## PART 2 - PRODUCTS

### 2.1 GENERAL

A. Acceptable manufacturers:

1. See individual specification section.

B. The product numbers contained herein are for reference only and may not be the most current available nor a complete listing of all features or options required. Where a manufacturer is listed without a product number, an equivalent item of the specified manufacturer is acceptable. Determination of equivalent is at the sole discretion of the Engineer. Where a conflict or ambiguity exists between the written description and the product number, the written description shall govern.

C. Equipment installed in exterior applications shall be fitted with fasteners and exposed surfaces of stainless steel or other corrosion resistant material.

D. Use only prime quality, new materials, apparatus and equipment.

E. Use electrical materials approved by UL and bearing UL label where listing has been established for materials or devices in question.

1 Manufactured items and fabricated assemblies of electrically operating equipment: UL approval or UL re-examination listing.

F. Structural steel for supports: ASTM A36.

1. Galvanize members installed in areas of high humidity or condensation and exterior locations.

2. Furnish other members with shop coat of red lead primer.

3. Shop fabricate for field assembly using bolts.

4. Minimize field welding.

5. Retouch primer after field welding.

## 2.2 SECURITY FASTENERS

A. Furnish material, head style and plating as appropriate for installation requirements.

B. Provide security fasteners on all device plates, equipment, etc., within occupied areas of the facility.

1. Torx head with center pin, hardened steel.

2. Provide five fastening tools.

## 2.3 GROUNDING

A. All equipment shall be grounded in accordance with the NEC, these specifications and drawings, and the equipment supplier's recommendations.

## 2.4 TRANSIENT SURGE PROTECTION

A. Industry Reference Standards: The following specification and standards are incorporated into and become a part of this specification by reference.

1 Underwriters Laboratories, Inc. (UL)
   a. No. 1449 2nd Edition Standard For Safety
   b. No. 497 A, B, and C.

2. Institute Of Electrical And Electronics Engineers (IEEE)
   a. Std. 142 - Recommended Practice For Grounding
   b. Std. 518 - Recommended Guide On Electrical Noise

3 ANSI/IEEE C62.41 - 1991 Edition

4. Federal Information Processing Standards
a. Publication 94 (FIPS PUB 94)

B. Acceptable manufactures: All device(s) shall be by the same manufacture.

1. TSP Devices: a. Base: Northern Technologies, Inc., Transtector Systems, Inc.

2. Other manufacturers desiring approval comply with Division 1

C. All TSP devices installed shall utilize Silicon Avalanche Diodes (SAD) as the primary means of protection. Secondary protection shall be SADs or Metal Oxide Varistors (MOVs). Each protection circuit shall be independent of each other and neither circuit shall short to ground on clamping transient surges.

D. Each 120 VAC circuit or feeder required for the electronic control and monitoring system shall be provided with a TSP device.

E. Each electronic security system circuit containing metallic conductor (s) shall be provided with a TSP device when leaving the confines of a building. Each electronic security system circuit containing metallic conductor(s) shall be provided with a TSP device when entering a building. Circuits serving building mounted devices or equipment that are located below the roof that originate or terminate in the building it is attached to, do not require TSP devices.

F. Locate TSP device at first termination point within the building. Locate all TSP devices in cabinets or enclosures.

G. All TSP devices shall be provided with a ground connection. The ground circuit shall be sized in conformance with the manufacturer's written requirements for proper grounding for the

associated device. The ground conductor shall be routed and connected to the nearest electrical system ground point.

H. Alarm contacts on TSP devices shall be connected to the electronic control system and annunciated as a system trouble alarm.

## 2.5 WIRING AND CABLE (AS IN MEANS AND METHODS OF SINGLE AND MULTIPLE CONDUCTOR CABLE INSTALLATION)

A. Power wiring: Single conductor cable, soft drawn, copper wire with type THWN 600 volt insulation, UL listed.

B. All cable shall be per manufacturer's written recommendation for the application and

environment anticipated for this project, but in no case less than what is required by these specifications. All cable shall be of standard type available from multiple manufacturers. Replace cable determined to be inadequate for specified performance.

C. All Class 1 wiring shall be building wire of type specified in Division 26 work. Provide overcurrent protection for conductors in accordance with NEC. Minimum sizes as follows:
   a. Indication: 18 GA minimum.
   b. Control: 14 GA minimum.

   2 All Class 2 wiring may be single conductor or multiple conductor cables. Conductors to be stranded type tinned copper, 22 GA minimum, PVC insulated.

D. Pulling lubricant: Do not use cable pulling lubrication compound containing petroleum or other products which may deteriorate insulation.

E. Color coding of conductors:

   1. Power circuits: in accord with NEC.

   2. Lock wiring: per drawings, match lock device color code where possible, similar throughout project.

F. All cable installation shall be continuous from equipment/device terminal to equipment/ device terminal. No splicing of cables will be allowed.

G Where connection to devices provided with factory installed wire leads is required, use "Wingnut" or "Wirenut" insulated conical spring-type connectors. Do not make connections and taps with indenter-type connectors.

## 2.6 RACEWAYS, WIREWAYS, BOXES AND FITTINGS

A. Raceways, wireways, boxes and fittings shall be provided under Division 26 with pull strings installed. Coordinate and verify sizes and installation are adequate for electronic security systems installation.

B. All raceways shall be sized for maximum 40 percent fill. All conductors shall be included in fill calculations. Minimum conduit size shall be 3/4".

C. Lock pockets have limited capabilities to accommodate incoming and outgoing conduits. Lock pockets shall not be used for wire termination other than that required for connector of lock in pocket. Wiring for no more than three (3) adjacent locks may be routed through a lock pocket, provided the lock pockets will accommodate such. Coordinate with Detention Equipment Contractor for conduit entries,

## 2.7 SPARE PARTS (SEE DIVISION 1)

A. Deliver spare parts in protective wrapping and packaging for proper storage.

B. Provide spare parts as indicated in individual specification section.

C. Spare parts shall be available to the Contractor to use as immediate replacements during the warranty period. The Contractor shall replace all spare parts used for the warranty requirements within 30 days of use.

D. Provide the following spare parts:

1. Transient Surge Protection: two (2) of each type used.

## PART 3 - EXECUTION

### 3.1 GENERAL

A. Use only workmen experiences in electronic security systems for installation of equipment and
termination of wire/cable systems.

B. When changes in location of any work are required, obtain approval of Engineer before making change. Engineer may move any item prior to or at time of rough-in up to 5 FT - 0 IN without extra cost.

C. Do not change indicated sizes without written approval in accordance with Division 1 requirements.

D. Equipment Installation:

1. Install all equipment in accordance with the manufacturer's recommendations, and accepted shop drawings.

2. Install all equipment in compliance with NEC requirements, NECA's "Standard of Installation", and recognized industry practices.

3. Do not attach electrical materials to roof decking, removable or knockout panels, or temporary walls and partitions unless indicated otherwise. Use hangers and other supports to support the equipment and materials, intended for this purpose.

4. Locate equipment as close as practical to the locations shown on the Drawings.

5. Maintain minimum 3-foot working clearances on each side of equipment or equipment racks where access is required to inspect, service, or adjust.

6. Check equipment against available mounting space indicated on the drawings. Coordinate location of equipment with existing devices to minimize interference. Bring all conflicts or clearance problems to the attention of the Engineer during the preparation of shop drawings.

7. Where the Engineer determines that equipment installation is not conveniently accessible for operation and maintenance, remove and reinstall equipment in a conveniently accessible manner.

8. Remove and protect existing equipment that is to be reinstalled. Make modifications and adjustments as required for re-mounting devices.

## 3.2 CUTTING AND PATCHING (SEE DIVISION 1)

A. Perform or pay for all cutting, fitting, repairing, patching and finishing of work of other sections where it is necessary to disturb such work to permit installation of electrical work.

1. Repair or replace existing or new work disturbed.

B. Avoid cutting, where possible, by setting sleeves or frames, and by requesting openings in advance.

C. Before cutting obtain approval of Architect or Engineer.

1. Use only approved methods.

2. Cut all holes neatly and as small as possible to admit work.

3. Do not weaken walls or floors; locate holes in concrete to miss structural sections.

D. Locate openings and sleeves to permit neat installation of equipment.

E Do not remove or damage fireproofing materials.

1. Install hangers, inserts, supports, and anchors prior to installation of fireproofing.

2. Repair or replace fireproofing removed or damaged, at no extra cost.

## 3.3 INSTALLATION OF EQUIPMENT

A. Install all equipment in accord with manufacturer's recommendations.

B. Provide all necessary anchoring devices and supports.

1. Use structural supports suitable for equipment, or as indicated.

2. Check weight and dimensions of equipment with shop drawings.

3. Do not cut or weld to building structural members.

C. Verify that equipment will fit support layouts indicated.

1 Where substitute equipment is used, revise indicated supports to fit.

D. Arrange for necessary openings to allow for admittance of equipment.

1 Where equipment cannot be installed as structure is being erected, provide and arrange for building-in of boxes, sleeves or other devices to allow later installation.

E. Prior to installation of electronic security equipment in control rooms and/or equipment rooms, complete all room finishes and provide a clean conditioned space for the electronic equipment installation. Maintain a secure, clean and conditioned space throughout the installation process. Where dust, dirt or moisture generating environment is anticipated or encountered after start of installation of equipment, cease work and wrap/seal all equipment in waterproof protective material. When environment is clean and conditioned, protective wrapping shall be removed, equipment cleaned, and work resumed.

## 3.4 ELEVATOR INTERFACE (SEE SECTION 14XXX)

A. Provide interface and coordination as required for installation of devices in elevator cabs and remote control and monitoring of elevators by electronic security systems. Devices and functions include cameras, intercom stations, personal alarm receivers, card readers, remote control, and monitoring.

B. Provided by Elevator supplier.

1 Mounting provisions for cab mounted equipment.
a. Rough-in box for intercom station.
b. Rough-in box for personal alarm receivers.
c. Rough-in box for mini dome camera.

2. Traveling cables for cab mounted equipment.

3. Interface terminals for elevator control from electronic security systems.
a. Cab call to each landing.
b. Floor selection for each elevator.
c. Door operation.
d. Service selection for off, local, remote, and fire.
e. Recall for each elevator.

f. Interlock condition

4. Interface terminals for elevator monitoring by electronic security systems.
a. Status of each elevator including service.
b. Location of each elevator.
c. Status of door at each landing.

C. Provided by Electronic Security Systems. Coordinate openings and mounting provisions with elevator installer.

1. Cameras and Enclosures.

2. Intercom Stations

3. Personal Alarm Receivers.

4. Card Readers.

5. Speakers

D. Provided by Electronic Systems Integrator.

1. All wiring from electronic security systems equipment to elevator machine room including termination on elevator equipment interface.

2. Dry contact output for elevator control including labeled terminal strips.

3. Labeled terminal strip input for elevator status reporting.

E. Coordination shall occur and be developed prior to, and clearly delineated on, submittal documents.

3.5 FIELD QUALITY CONTROL (SEE DIVISION 1)

A. Perform indicated tests to demonstrate workmanship, operation, and performance.

1. Conduct tests in presence of inspectors of agencies having jurisdiction if required.

2. Arrange date of tests in advance with, manufacturer and installer.

3. Give all inspectors minimum of 24 hours notice.

4. Furnish all labor and materials required for period of test.

B. Repair or replace equipment and systems found inoperative or defective and re-test.

1. If equipment or system fails re-test, replace it with products which conform to Contract Documents.

2 Continue remedial measures and re-tests until satisfactory results are obtained.

C. Test equipment and systems as indicated for each item, unless otherwise recommended by manufacturer.

D. Coordinate work of this section with work of other sections to insure timely delivery and installation of work.

E. Design all systems for continuous 24 hour operation.

## 3.6 TEST AND VERIFICATION

A. General: The Contractor shall verify that all requirements of this specification are met. Verification shall be through a combination of analyses, inspections, demonstrations and tests, as described below.

B. Verification by Inspection: Verification by inspection includes examination of an item and the comparison of pertinent characteristics against the qualitative or quantitative standard set forth in the cited paragraph. Inspection may require moving or partially disassembling the item to accomplish the verification. Inspection shall be made of all equipment installations, proper functioning of all locking hardware and lock controls, mounting and wiring of electrical and signal distribution cabinets and components, and mounting and placement of sensors, cameras, etc. to ensure requirements of the specifications are complied with and that the overall installation is accomplished in a professional and workmanlike manner and in accordance with manufacturer's written recommendations. The Owner's quality control representative(s) shall have full opportunity to witness the required inspections or to conduct his own inspections of the installation.

C. Verification by Test and Demonstration: The Contractor shall verify by formal demonstrations or tests that the requirements of this Specification have been met. All tests shall be documented and report of results submitted to the Engineer.

D. Test Verification Requirements: Paragraphs 1-3 below list specific requirements which shall be verified by formal demonstration/test. THE ENGINEER SHALL BE NOTIFIED IN WRITING THIRTY(30) DAYS IN ADVANCE OF ALL SYSTEM TESTS.

1. Factory Tests: Following factory engineering and assembly, the Contractor shall individually test each sensor and other components and verify the proper functioning of each component within a particular subsystem. Each subsystem shall be similarly tested until all detection zones, alarm assessment components, alarm reporting and display, and access control functions have been verified. Any deficiency pertaining to these requirements shall be corrected by the Contractor prior to shipment of the equipment to the project site.
   a. After fabrication, assembly and programming of the security electronics systems, perform tests of the integrated security electronics system, including duress alarm, access control, intrusion detection, intercommunication, intercom, video surveillance, operator interface, and miscellaneous controls, with all functioning as a single, integrated system. Factory testing is a major milestone that shall commence only after all shop assembly, system integration, and software development is

complete. Completion of the Factory testing is required prior to shipment of any system equipment to the site for installation.

   b. Each input and output point, operational sequence, touch screen display, operation of touch screen will be tested. Provide sample field devices, approved mock up devices and jumpers to

simulate actual field operating conditions. In addition, simulated system failures, response time, boot up time and other tests will be conducted as directed.

c. Conduct tests in strict accordance with an approved test procedure. Demonstrate full compliance with the required operating modes and sequences of operation. Record test results on a report that shall include a list of all personnel witnessing the tests, test methods used, and a record of each specific test made.

d. The factory testing shall include all equipment and programming for the entire facility.

2. Preliminary Tests: Following installation, the Contractor shall individually test each sensor and other components and verify the proper functioning of each component within a particular subsystem. Each subsystem shall be similarly tested until all detection zones, alarm assessment components, alarm reporting and display, and access control functions have been verified. Any deficiency pertaining to these requirements shall be corrected by the Contractor prior to final functional and operational tests of the system. When subsystem verification is complete, the entire system shall be tested to assure that all elements are compatible and function properly as a complete system.

3. System Validation Test: The Contractor shall conduct validation testing of the completed systems. During validation testing, the facility shall be under the control of the Contractor and shall not begin until all parts of the system are 100% functional. Owner personnel shall be part of the validation testing team.

a. The official validation test report shall consist of a continuous test of the entire facility. No revision or correction to the system programming is permitted during this test. If any such programming is required, the test must be re-started from the beginning. However, adjustment of door hardware (i.e. door position switches and lock status switches) will be permitted.

b. Each controlled door shall be tested for each and every function required by this specification and the results of these tests shall be printed from the ADS using the report generation application. Contractor shall find the source of any gaps in the sequence log, and correct the deviation. The door shall be re-tested to confirm the corrections.

c. Each function, not related to an individual door, shall be tested individually and the results of the test shall be individually printed from the ADS using the report generation application. Contractor shall find the source of any extraneous events or gaps in the sequence log, and correct the deviations. The function shall be re-tested to confirm the corrections, and the re-test results printed for the validation report.

d. For each computer in the system, print a resource usage report showing.
   1) All programs running on that computer and memory requirements.
   2) A plot of the CPU utilization during the validation test. Identify the maximum reached and the circumstances pertaining thereto.

e. For each PLC in the system, print a resource usage report showing,
   1) Program memory used.
   2) Remaining available installed memory.
   3) Remaining available installed inputs and outputs.

f. Upon completion of the validation testing submit complete validation report for the installed system to the Engineer.

4. Demonstration Upon Completion of Work: Upon successful completion of the System Validation Test, the Contractor shall schedule and request final completion demonstration and the Engineer notified. The request and notification shall include certification that the

installation is complete and operable and has satisfactorily performed the fmal tests specified herein. The acceptance testing and final inspection will be accomplished in the company of the Engineer and the Owner's representative(s). The demonstration shall be structured so that all sensors and controls are stimulated directly in their installed and finally adjusted positions and all audible and visual displays, signals, alarms and other responses are demonstrated. A log of all demonstration activities and results shall be maintained by the Contractor. Typed copies of this log shall be submitted to the Engineer within seven days of the demonstration.

E. Upon successful completion of the Demonstration Upon Completion of Work, the electronic security systems will be considered as substantially complete.

F. The Contractor shall carefully plan and coordinate the demonstrations so that all activities can be satisfactorily completed within eight (8) cumulative hours. The Contractor shall provide all necessary instruments, labor and materials required for demonstrations, the equipment manufacturer's technical representative, and qualified technicians in sufficient numbers to perform the demonstration within the time limits imposed by this Specification.

G. In the event that the Engineer are required to witness a retest at a later date because the Contractor is not adequately prepared to conduct the acceptance tests or because the systems being tested have failed such tests, which shall be solely determined by the Architect, the costs of witnessing additional tests (based on time and expenses at the established rates of the Engineer) shall be borne exclusively by the Contractor. In such an event, a change order to the General Construction Contract will be executed for compensation of the Engineer witnessing the tests.

## 3.7 SHAKEDOWN PERIOD

A. The Electronic Systems Integrator shall coordinate with the Contractor to establish a shakedown period for the electronic security systems. Shakedown period shall be a minimum of 28 days.

B. Initiation of Shakedown Period: Prior to initiation of shakedown period, all work related to and supporting the electronic security systems shall be substantially complete. Such work related shall include, but not be limited to the following:

1. All electrical power circuits and interface points.

2. All lighting in control locations.

3. All environmental conditioning and control in control locations.

4. All clean-up in control locations.

5 All locking devices and sliding door devices operational.

C. During the shake down period the Electronic System Integrator shall provide all labor and materials to support operation of the facility by the Owner's staff.

D. The Electronic Systems Integrator shall maintain a log of all anomalies, malfunctions and repairs encountered during the shakedown period. The log shall be submitted to the Architect for assessment at the conclusion of the shakedown period.

E. Owner Training may be conducted during the Shakedown Period.

## 3.8 ADJUST AND CLEAN (SEE DIVISION 1)

A. Inspect all equipment and put in good working order.

B. Clean all exposed and concealed items.

C. Touch up paint where finish is damaged to original color and texture.

D. Clear debris from and vacuum clean the interior of all turrets, consoles, equipment cabinets and enclosures.

## 3.9 WIRING

A. All wiring within equipment: Point to point with appropriate terminal block connections for each wire and component termination.

1. All connections mechanically secure.

2. All terminations on terminal blocks.

3. All terminal strips labeled to match submittal documents.

B. All cable and wire: As recommended by manufacturer of system, minimum as indicated in individual sections.

1. Standard type available from multiple manufacturers.

2. Replace cable determined to be inadequate for specified performance.

3. All cable and wire shall be professionally labeled and tagged at each point of termination to match submittal documents.

C. Provide all wire and cable and perform all terminations. Check each cable system for opens, shorts, faults, or other discontinuities.

D. All wiring shall be color coded throughout.

E. Install all cable in conduit in accordance with other sections of these specifications. Minimum conduit size shall be 3/4 inch trade size. Size all conduit such that cable, wire and/or tubes do not to exceed 40 percent fill.

F. All wire and cables shall be installed continuous from field device to terminal point in equipment cabinet, enclosure or console. No splices or intermediate terminations will be allowed

G. All cables specified herein are based on indoor "dry" applications unless noted otherwise. Where actual construction conditions require cable other than indoor "dry" applications, provide suitable cable to meet performance requirements of the systems for which they the cable is to be provided.

3.10 OWNER PERSONNEL TRAINING (SEE DIVISION 1)

A. Provide training of operations and maintenance staff. Training shall be structured and developed to ensure proper understanding of systems to allow effective operation and maintenance of all systems in this Division of work.

B. Conduct session for operational staff of duration of no less than twenty-four (24) hours.

C. Conduct training session for maintenance staff, consisting of not less sixteen (16) hours. Maintenance staff shall participate in operational staff training prior to maintenance training.

D. Provide digital video recording of all demonstrations. Provide slides or overheads for training sessions to provide audio/visual aids. Each session shall be recorded in its entirety. Contractor shall enhance recording with indexing, editing, and insertion of necessary video and audio to develop a comprehensive, professional-quality training DVD. DVDs shall be playable on any consumer grade DVD player or PC. Furnish four (4) copies of each DVD to owner with four (4) spare training manuals of each type. Provide electronic copies of training manuals in .pdf format. Provide four (4) CD copies of training manuals. All DVD and CD media shall not be copy protected.

E. See individual sections for specific training requirements.

3.11 DEVICE MOUNTING SCHEDULE

A. Mounting of devices shall comply with ADA standards. Operating devices shall be no more than 54" above finished floor, except where an interposing wall is within 18" of the device. In such a case, the operating device shall be no more than 48" above finished floor.

B. Where devices are mounted in door frames, mount device above the lock pocket such that operating component elevation is equal to or less than 54 IN above finished floor.

C. Mounting heights as indicated below. Coordinate height of device with that of other trades i.e. light switches. Dimensions are to top of box unless otherwise indicated.

| | | |
|---|---|---|
| 1. | Intercom Station | 48 IN. |
| 2. | Paging Horn | 12 IN below ceiling/structure above. |
| 3. | Duress Alarm Station | 48 IN. |
| 4. | Push button Stations | 48 IN |

5. Card Readers 48 IN

6. Equipment cabinets and enclosures 72 IN.

7. Camera: Mounting height on drawing is lens elevation with horizontal housing.

8. Desk mounted devices: Coordinate final location of floor boxes, wall boxes and desk mount devices with Architectural furniture plans.

**END OF SECTION**

**SECTION 28 13 00 - ACCESS CONTROL**

CONDITIONS OF THE CONTRACT AND DIVISION 1, as applicable, apply to this Section.

PART 1- GENERAL

1.1 RELATED WORK

A. 26 05 26 – Grounding and Bonding
B. 26 05 29 – Electrical Hangers and Supports
C. 26 05 33 – Raceway and Boxes
D. 27 10 00 - Category 6 Structured Cabling System
E. 28 00 00 - Electronic systems general requirements

1.2 WORK INCLUDED

A. This specification section scope of work shall include card reader access interface and all associated wiring at locations shown on the project drawings. Provide and install all materials and devices as designated below.
   1. Card Readers
   2. Wiring from the card reader to the head end location and all door hardware
   3. Connections to electrified door hardware and associated power supplies
   4. Security contractor to provide full functioning access control system with all required hardware, software, PC /servers etc.
   5. All access control door cabling and door controller hardware shall be located on back wall of security closet 30314. Coordinate all PC/server location with Fort Bend Facilities Electronic Lead.
   6. All security installation shall be coordinated with Fort Bend Facilities Electronic Lead.
   7. Preconstruction meeting with Fort Bend Facilities Electronic Lead., installing technician and project superintendent.
   8. Contractor shall test and correct all access control programming
   9. Security contractor to tie into existing Wanderware system. All Panic buttons, Intercom, Access control, Camera integration and control station integration shall be programed by MCS / Argyle only. Programming shall be part of this contract.
   10. In secured holding / detained area's provide dentition grade hardware / devices.
   11. THE ACCESS CONTROL EQUIPMENT AND ASSOCIATED POWER SUPPLIES SHALL BE PROVIDED AND INSTALLED.
   12. Structured cabling for door controllers shall be installed by division 27 cabling contractor. Access control integrator shall coordinate with cabling contractor to provide cabling infrastructure for door controller devices

1.3 CODES AND STANDARDS

The system shall comply with the applicable Codes and Standards as follows:

A. National Fire Protection Association Standards:
   1. NFPA 70 National Electric Code
   2. NFPA 72 National Fire Alarm Code

3. NFPA 101 Life Safety Code

B. Local & State Building Codes

C. Requirements of Local Authorities having Jurisdiction

D. Underwriters Laboratory Requirements and Listings for use in Security Alarm Systems.

E. Requirements of American Disabilities Act (Public law 101-336).

F. Texas Accessibility Standards (T.A.S.)

G. State Fire Marshall.

H. Texas Insurance Code.

1.4 QUALITY ASSURANCE

A. Contractor Qualifications:
1. The installing contractor shall be the authorized representative of the Access Control Manufacturer to sell, install, and service the proposed manufacturer's equipment. The installing contractor shall have represented the security alarm manufacturer's product for at least two years.
3. The installing contractor shall be licensed by the State of Texas as a security services contractor to design, sell, install, and service security alarm systems.
4. The installing contractor shall provide 24 hour, 365 day per year emergency service with factory trained service technicians.
5. The installing contractor shall have personnel on their staff that has been actively engaged in the business of designing, selling, installing, and servicing security alarm systems for at least ten (10) years.
6. All Contractors must submit to the owner prior to starting any work the factory training certificates for all personnel that will be working on the access control system. No person is allowed to work on the system without proper manufacturer's certification.
7. The proposing contractor for this system and the installing contractor of this system shall be of the same organization. Absolutely no subcontracting of any portion of this system by the proposing contractor will be allowed.

1.5 SUBMITTALS

A. The installing contractor and/or equipment supplier shall provide complete and detailed shop drawings and include:
1. Riser diagrams.
2. Complete floor plan drawings locating all system devices.
3. Factory data sheets on each piece of equipment proposed.
4. Detailed system operational description. Any specification differences and deviations shall be clearly noted and marked.
5. Complete system bill of material.
6. Line by line specification review stating compliance or deviation.

B. Provide submittals for review to Security consultant and Fort Bend Facilities Electronic Lead.
C. All submittal data will be in bound form with Contractor's name, supplier's name, project name, and state security license number adequately identified.

## PART 2 - PRODUCTS

### 2.1 GENERAL

A. Contractor Responsibility

All products not provided by [Client] shall be new and unused, and be provided from the manufacturer's current and standard production. Where two or more equipment items of the same kind are provided, all shall be identical and provided by the same manufacturer. Drawings and specifications shall indicate major system components, and may not show every component, connector, module, or accessory required to support the operation specified. Contractor will provide all components needed for complete and satisfactory operation.

### 2.2 PRODUCT AVAILABILITY

A. Prior to submitting a proposal, shall determine product availability and delivery time, and include such considerations into his proposed contract time.

B. Product acquisition

Certain products specified may only be available through factory-authorized dealers and distributors. Contractor shall verify his ability to procure the products specified prior to submitting a proposal.

C. Wire and Cable

1. Installation

All wire and cable required to install systems shall be provided as indicated. Wire and cable shall be sized to provide minimum voltage drop and minimum resistance to the devices being supplied.

2. All cables will be specifically designed for their intended use (direct burial, aerial, etc.).
3. All wire and cable will comply with the equipment manufacturer's recommendations for wire and cable.
4. Color codes will be consistent in cables used for the same purpose.
5. All wire and cable will comply with all applicable codes and ordinances.
6. All Power over Ethernet (PoE) cable will be Cat 6. Provided by data contractor.

D. Conduit and Raceway Systems

1. All interior and exterior conduit and raceway systems used shall be compliant with applicable codes and ordinances.

E. Junction and Pull Boxes

1. Interior Boxes; Sheet Metal Outlet Boxes: Sizes are determined in accordance with code requirements for conductor fill. No box will be smaller than a single gang 1-1/2 inch deep.

Box covers will be provided as required.

2. Exterior Boxes: All exterior boxes shall be NEMA 4 or NEMA 3R, watertight and dust-tight.
3. Controller Boxes: All controller boxes provided are 2-gang boxes.
4. All interior and exterior box covers will be fastened using security screws.

F. Lightning Protection
1. The Contractor shall provide suitable lightning protection for all EAC equipment.
2. All lightning protection equipment will be UL Listed.

G. Surge Protection
1. The Contractor shall provide suitable surge protection for all EAC equipment.

## 2.3 ELECTRONIC ACCESS CONTROL AND ALARM MONITORING SYSTEM EQUIPMENT

A. Functional Requirements
1. General
a. The system infrastructure shall be of a modular type, capable of allowing future expansion.
b. The security system encompasses the following subsystems:
1) The access control and alarm subsystems shall execute functions related to access control, site and door surveillance, motion detection, intrusion, glass breakage, and external alarm sensing, such as fire alarms.
2) The imaging subsystem, linked to the access control/alarm subsystems, shall be capable of printing an image and data on cards using the same system database.
3) The card access control subsystem shall be composed of three hierarchy levels:
a) Access controllers that control supervision and command functions.
b) A control station that monitors alarms and responds in real time to all information in a user-friendly manner.
c) A group of peripheral devices, installed in areas requiring protection, each dedicated to their specific function.
c. All databases have the ability to do the following:
1) Add, modify, view, or remove information.
2) Provide storage of all system transactions in a retrievable file.
3) Log all events by time and date.
4) Log on to the software by means of valid user name and password.
5) Make system configuration changes such as, but not limited to, door open time, door open too long, point and reader names, when and where a card holder is valid, and the ability to add or modify card databases at any time.
6) Provide the ability to configure event display, alarms, e-mail and SMS notification based on one or more of schedule, group, zone, event type and resulting action at the door.

7) Allow for configuration of rules based on incoming events that lock a zone, lockdown a zone, unlock a zone or revert to the current unlock schedule.

8) Provide the ability for manual operator control of system outputs. The manual functions shall include the ability to energize, de-energize, and return to original state.

9) Provide the ability for manual operator control of system inputs. The manual functions shall include the ability to bypass and un-bypass.

10) Provide the ability for manual operator control of system access services. The manual functions shall include the ability to lock, unlock, and set door to default schedule.

11) Provide the ability for manual operator control of system alarm services. The manual functions shall include the ability to arm, disarm, and return the alarm zone to default schedule.

12) Provide the ability for manual operator control of system arming services. The manual functions shall include the ability to arm, disarm, and set alarm zone to a schedule.

13) Provide the ability for manual operator control of system equipment services. The manual functions shall include the ability to activate, deactivate, and set equipment service to default schedule.

14) Provide the ability to easily check status of each door including whether the controller is available or initializing, the controller configuration is current, if the door is locked or unlocked and open or closed. Variations on these statuses shall indicate if the state is normal or extraordinary, such as a lock that is overridden with lockdown preventing access through the door.

15) Provide the ability to remotely update controllers and other units with revisions of the firmware program. Devices shall be fully reprogrammable so their internal software features can be updated when new revisions of the device's system firmware are released.

2. Card Technology Supported

The system provides support a several card (credential) formats and allows customization of the formats in the system including, but not limited to, the following:

a. Select Wiegand formats from 15–64 bits

b. HID Prox compatible (125 KHz) key code formats

c. 26 bit key code with custom site code and card numbering for HID ISOProx II cards, ProxKey II cards and ProxKey III

d. 26 bit key code compatible with HID DuoProx II, HID ProxKey II, ProxKey III Keyfob credentials

3. Card Types Supported

The system provides support for several card and keyfob credentials compatible with the supported card readers including, but not limited to, the following:

a. Xceed (HID Prox compatible) part numbers 7410, 7510, 7510, 7510C, 7510H, 7510M1, 7610, 7710-D35, 9420, 9520, 9520M1 series cards, ISO-X Lite Secure Access Card (App only/14443)

b. Xceed MIFARE part numbers: 9451, 9551, 9558, 9651, 9751, 9758, 9951, 9958 memory cards.

c. HID part numbers 1326LGSMV, 1326LGSMV, 1351LBSMN, 1391LSSMN, 1346LSSMN (FOB), 1346LSSMN (custom numbering, keyfob), 1386LGGMN, 1324, 1386LGGM, 1336LGGMN.

d. HID iCLass part numbers: 2080PGGMN, 2050PKNMN, 2060PKNMN, 2000PGGMN for 2 application areas, and 2002CGGMN, 2022PGGMN for up to 16 application areas.

4. Card Readers Supported

The system provides support for several proximity and swipe card readers and readers with keypads including, but not limited to, the following:

a. Ingersol Rand AptiQ part numbers: PR10, SM10, MT11, MT15, MTK15.

b. HID part numbers: 5355AGK00, 5355AGK14, 5355AGN00, 5365EBP00, 5365E1P00, 5365EGP00, 5375AGN00, 5395CB100, 5395CK100, 5395CG100, 5455BBN00, 5455BKN00, 5455BGN00, 6005B1B00, 6005BKB00, 6005BGB00.

c. HID Standard iClass reader part numbers: 6100CGN0002, 6100CKN0002, 6140CGN0002, 6140CKN0002, 6120CGN0002, 6120CKN0002 card readers, and 6130CGN000200, 6130CKN000200, 6130CGN000214, 6130CKN000214 readers for card and PIN use.

d. HID MultiClass reader part numbers: 6145CGN0002, 6145CKN0002, 6125CGN0002, 6125CKN0002, 6136CGN000200 card readers, and 6136CKN000200, 6136CGN000214, 6136CKN000214 readers for card and PIN use.

e. HID MultiClass Government Compliant reader part numbers: 6145CGN000A-G3.0, 6145CKN000A-G3.0, 6125CGN000A-G3.0, 6125CKN000A-G3.0 card readers, and 6136CGN000A00-G3.0, 6136CGN000A00-G3.0, 6136CGN000A14-G3.0, 6136CKN000A14-G3.0 readers for card and PIN use.

5. Other Door Devices Supported

The Infinias system supports other devices including, but is not limited to, the following:

a. ROFU door hardware: 2400-05 Kit, Mag Lock (standard mount), Mag Lock (mortise mount), Mag Lock (front mount), 8011-004-12-28 Delayed Egress Lock System, 2" Square "Push to Exit" LED.

b. BOSCH DS150i Motion Detector, DS151i Motion Detector, DS150i PIR, DS151i PIR.

c. GRI 29-A-W Surface Mount Switch Set, 180-12-W Steel Door Switch Set.

d. Stanley® EL series wireless locksets with access control.

6. Front-End Software; System Configuration

a. The system shall have the ability to:

1) Support groups and membership of a cardholder in multiple groups

2) Build compound schedules for cardholders who have been granted access to specific doors or zones through their membership in multiple groups. This shall be automatic and transparent to the user.

7. Time & Schedules
    a. Schedule definitions shall include starting time, ending time, and days of the week. A schedule shall cover 24 hours by 7 days. Schedules shall allow a minimum of 3 distinct segments in one schedule. Schedules can be overridden by holiday sets and holiday schedules.
    b. Maximum number of schedules that can be created and assigned in the system shall be 4 billion.
    c. Holiday Sets are groups of holidays. The system shall support up to 4 billion holidays and 4 billion holiday sets. Each Schedule shall support up to 7 holiday sets assigned to it for the purpose of overriding the schedule on those dates.
    d. Each Holiday Set when assigned to a schedule can have its own 24-hour schedule.
    e. The maximum number of holidays that can be stored on a door controller shall be 254.
8. Hardware Configuration
    a. Provide the ability to add and configure hardware modules (door controllers). A minimum of 500 door controllers shall be able to be configured.
    b. Support auto-discovery on the server's default subnet or be configured to search on a different subnet. A list of controllers discovered on the subnet shall be listed when creating a door and shall be automatically removed from the discovered list once assigned with a door.
    c. Encapsulate all key configuration elements of a controller/door in a set of user selectable templates with associated wiring diagrams available in the software.
    d. Allow for the addition of new templates to the system as required.
9. Zones
    a. A zone is a physical area with a set of one or more doors that provide access into and out of that area
    b. A door shall join two zones together
10. Groups
    a. A group is a collection of people.
    b. A person can be a member of one group or many groups.
    c. The system shall support up to 4 billion groups and people.
11. Privileges
    a. A privilege grants a group access to a zone on a schedule.
    b. A group may have only one privilege per zone.
    c. A group may have any number of privileges.
    d. Privileges may only be assigned at a group to zone level.
12. Reports
    a. The system shall not use a proprietary reporting facility. Tools adequate to create, modify, generate and export reports shall be included in the system.
    b. There shall be no charge for any tools required to design or modify reports.

c. The reporting system shall allow for reports to be run from within the system and separately.

d. The reporting system shall be server and browser based for viewing, printing and exporting reports.

e. Badges shall be designed and managed in a manner similar to reporting.

f. Badges shall be printable directly from the edit dialog for a person, and from the reports menu. The Reports menu shall allow badges to be printed individually or severally (batch).

g. Both single and dual sided badges in portrait or landscape formats shall be supported.

h. Barcoding in a report or on a badge of any available field shall be supported in a minimum of 8 different formats.

13. Miscellaneous Services

a. Database management shall be performed using the database vendor's standard toolset. The toolset shall be automatically installed on the server when the access control software is installed.

b. An Operator's service shall allow the user to define operator privileges that shall define the operator actions that can be performed while being logged on to the application. A minimum of three role types shall be available.

1) Administrator – shall be able to perform all functions within the software

2) Human Resources – shall be able to see events, run reports, view door status, and perform door specific actions such as momentary lock and unlock. The HR operator shall be able to create, edit and delete people and groups, and print badges.

3) User – shall be able to view events, run reports, see people and groups, monitor door status, and perform door specific actions. The User operator shall not be able to modify any data in the system.

14. Events and History

a. All events shall be recorded in the database. The database shall have the capacity to store a minimum of 20 million events. The system shall include the ability to upgrade its database to a storage capacity of 4 billion events.

b. A History Report search shall show the event that occurred, when the event occurred, where the event occurred, and who caused the event to occur. Video attached to events shall also be available for playback from the History screen.

c. The administrator shall define what event will be shown on the events page. This shall include the ability to build rules based on various criteria to filter the event

d. Events presented as Alarms on the events page shall be fully configurable by the administrator. The administrator shall have the ability to include schedules, zones, groups and event types as criteria in determining if an event is an alarm.

e. The system shall have the ability to accept events from 3rd party systems. The administrator shall be able to define rules and actions based on those events.

B. Technical Requirements

1. Environment

a. The system shall be designed to operate, per the requirements in this technical specification, within the following ambient conditions:

b. Computer Components

1) Temperature: 50 °F to 86 °F (10 °C to 30 °C)

2) Humidity: 20% to 80%, noncondensing

c. Components installed interior or exterior

1) Temperature: -4 °F to 200 °F (-20 °C to 70 °C)

2) Humidity: 0 to 95% (non-condensing)

d. The security contractor shall take all necessary precautions to ensure the proper functioning of the system components within the above-defined ranges, or within the manufacturer's defined ranges, whichever applies.

2. System Capacities

a. The functional capabilities shall be considered standard, without the need for add-on software or hardware.

b. The system shall require a server with the ability to support a minimum of 20 concurrent (logged on) control locations utilizing LAN/WAN network connection.

d. The system minimum capacity shall be 500 readers and 10,000 cardholders,

3. System Components

a. The complete system integrates three distinct groups of components:

1) Primary Components such as the power/communication unit, door controllers, and readers.

2) Secondary Components such as magnetic contacts, motion detectors, and locking devices.

3) Control Stations such as the server, secondary station, and display monitors.

b. Primary Components

1) Ethernet Access Controllers

a) The Ethernet access controller shall be one of recent technology, based on a microprocessor, and shall be compatible with a reader for proximity type cards. It shall have previously demonstrated its capacities in a similar access control application. It shall be capable of storing a maximum of 16,000 events in a stand-alone operation, and be capable of transmitting this information to a management system when the network is reconnected.

b) The Ethernet access controller shall incorporate a web browser interface server for administration of the controller through a standard Microsoft® Internet Explorer® browser. The Web page shall closely emulate the optional rich-client host software used to administer the system.

c) Memory for the Ethernet access controller shall be flash-based and nonvolatile. If power to a controller is lost, upon restoration of power, the unit shall retain all information contained at the time of the power loss including cardholder database, system configuration, and event transaction history.

d) The Ethernet access controller shall be modular and include terminations for wiring to other electronic modules.

e) The Ethernet controller shall communication using 10BASE-T standard.

f) Ethernet access controllers shall provide encryption (AES 128 Bit) at both the system level and domain level.

g) The following information shall be set and accessed from each controller by way of Ethernet communication:

(1) IP address

(2) Protocol used for assigning address: DHCP or Static

(3) Serial number

(4) Ability to either enable or disable Web mode (direct browser-based communication with the controller)

(5) Ability to provide verification/validation of a security key

h) The Ethernet access controller shall incorporate support for peer-to-peer communications between Ethernet access controllers. Up to 32 Ethernet access controllers shall be configured in a single domain and shall communicate peer-to-peer with each other.

i) The Ethernet access controller shall be equipped with an input/output port allowing communication with a network switch. If one of the Ethernet access controllers should lose power, it shall not affect the operation of the other access controllers.

j) The Ethernet access controllers shall have the ability to acquire alarms, validate the cards, and command doors when required.

k) The Ethernet controller shall be placed in a 2-gang box housing, recessed or surface mounted, as close as possible to the zone. The controller housing shall be secured with an anti-theft screw.

l) The Ethernet controller shall have an integrated warning buzzer to locally signal alarms.

m) The mounting position of the Ethernet controller within its housing shall have two levels:

(1) Extended: The Extended level shall allow the connection of the equipment wiring.

(2) Recessed: The Recessed level shall allow for the installation of the protective cover.

n) The wiring distance between the network switch and each Ethernet controller shall be a maximum distance of 100 meters (328 feet). The VDC voltage from a Power over Ethernet (PoE) switch shall be convertible to the VDC power necessary (48 VDC [350 mA]) to maintain appropriate power to the equipment connected to the controller.

o) An optional power source such as an external power supply of 24 Vdc (1 A) shall be available to each Ethernet controller.

p) Address confirmation of each controller shall occur automatically without

the use of DIP switches.

q) The controller shall be able to integrate two card readers allowing for timed “hard” and “soft” anti-passback. Using peer-to-peer communications, the controller shall not require server communications for the anti-passback function to fully operate.

r) An infrared tamper switch shall be integrated in each controller to prevent unauthorized manipulation of the equipment.

s) LED displays shall indicate the status of the input and output points directly on the controllers to facilitate local visual diagnostics.

t) Each Ethernet controller shall have four input points, four output points including an integrated warning buzzer, two external 12 Vdc power outputs, and two ports for intelligent proximity card reader with or without keypad.

u) Ethernet controllers shall be capable to fulfill the following power requirements to the following connected devices:

(1) 12 Vdc (250 mA) to each reader

(2) 12 Vdc (450 mA) for a lock using an open collector relay

v) The controller shall electronically protect output points against overloads and display them on the Event screen.

w) The security contractor shall define the quantity of Ethernet controllers required for the building to be controlled and shall ensure that the quantity conforms to the actual needs.

x) Ethernet controllers shall be no larger than 2.84" D x 1.70” W x 4.30" H. Operating temperatures shall be 0 °C to 54 °C (32 °F to 130 °F).

y) The four input points shall be either normally closed (N.C.) or normally open (N.O.) programmable and shall accept optional end-of-line supervision.

z) Two of the four output points shall share a maximum power source of 450 mA at 12 Vdc with electronic overload protection, and it shall be capable of transferring the necessary voltage from one point to another in the event of a transition. The third output point shall be a single pull double throw (SPDT) relay type or C form with an initial state programmable to a maximum capacity of 5 A at 30 Vdc.

aa) The integrated warning buzzer shall provide a sound level maximum of 85 dB.

bb) The two external power outputs shall provide 250 mA at 12 Vdc, be regulated, and have an electronic overload protection.

2) Card and Code Reader

a) Physical Characteristics

(1) Mid-Range with Keypad Readers: Reader shall incorporate a standard 12-key digital keypad with the same numbering configuration as a standard touch-tone telephone.

(2) Mullion Readers: Reader shall have a width of less than 1.75 inches to

mount without modification to narrow rail stile doors.

(3) Mid-Range Reader: Reader must be capable of providing a read range up to 6 inches without modification.

(4) Reader shall be potted with a UL Listed flame-retardant potting material.

(5) Reader cover shall be secured to the reader using a security screw.

(6) Reader shall be designed for both surface mounting and mounting on a single-gang electrical box.

(7) Reader shall operate in a temperature range -31 °F to 151 °F (-35 °C to 67 °C).

b) Performance Requirements

(1) Reader shall provide an operating distance of 1–6 inches depending on the reader model, card model, and mounting environment.

(2) Reader shall be capable of transmitting the card data in the Wiegand protocol.

(3) Reader shall operate across a voltage range of 8 – 16 Vdc.

(4) Reader shall operate at an average current not to exceed 130 mA DC, and it shall not exceed a peak of 260 mA DC for mid-range keypad units (100 mA DC average, 260 mA DC Peak for Mullion and Mid-Range units).

(5) Reader shall have a lifetime warranty against manufacturer defects and workmanship.

c) Proximity Cards

(1) The Wiegand cards shall be of either proximity or swipe type. They shall be sealed and resistant to normal usage and weather conditions. They shall be of ISO standard credit card size and thickness. They shall also be available in a key chain/key fob format.

(2) The cards shall not affect nor be affected by:

(a) Magnetically encoded cards such as credit cards or bankcards, even when stored side by side in a wallet.

(b) Coins, keys, or other metal parts.

(c) Shoplifting detections systems installed in certain retail outlets.

(d) Communication equipment.

(e) Magnetic fields normally found in offices.

(3) It shall be impossible for a person who discovers a card to determine that the card belongs to a particular client.

(4) The access cards shall be guaranteed for a minimum period of two years from any defects resulting from normal use.

(5) The software shall electronically encode the cards so that their availability shall be restricted by the requirement of a particular site code.

(6) HID 125 KHz proximity cards of all standard formats, including Corporate 1000 and long format cards of up to 64 bits, shall be supported.

(7) XceedID 125KHz proximity cards of all standard formats shall be supported.

3) Numeric Keypad

a) The numeric keypad is used for access control readers combining an access card and "PIN" code.

b) The numeric keypad shall meet or exceed the following specifications:

(1) Operate on a continuous low voltage of 12 Vdc.

(2) Solid construction and resistant to vandalism.

(3) LED indicator.

(4) Audible signal for each key touch.

4) Ethernet 32 I/O Device (for elevator integration)

a) The Ethernet 32 I/O device shall be installed on the same subnet as the system management server.

b) The Ethernet 32 I/O device shall be configured with the system management system.

c) The Ethernet 32 I/O device shall contain 32 channels configurable as inputs or outputs.

d) When the Ethernet 32 I/O device channel is configured as an output can be configured as "normally open" or "normally closed". When configured as "normally closed, the output will provide a TTL level voltage (5 Vdc).

e) When I/O channels are configured as outputs, the device shall provide a combined current of at least 400 mA to connected devices.

5) Acceptable Manufacturer: infinias or Approved OEM [NO EXCEPTIONS]

c. Secondary Components

1) Magnetic Contact: Recessed

a) One recessed magnetic contact shall be installed on each door to be controlled or monitored. In locations where there are double doors, two contacts shall be installed and the connections shall be made so that the opening of each door is detected.

b) Unless indicated otherwise, and taking into consideration the environment, the security contractor shall install the recessed magnetic contacts per the following guidelines:

(1) The door contact shall be installed and centered on the upper doorframe, at a maximum distance of 4 inches from the opposite side of the door hinges.

(2) The door contact shall be solidly anchored with adhesive or silicone so that it cannot be removed without breakage or the use of a special tool.

(3) When the contact is installed in the recessed part of a metal doorframe,

an appropriate solidly attached metal support shall be used. The tolerance "gap" shall be adjusted to the frame and the door.

(4) The wiring shall optionally be supervised by an end-of-line resistor.

(5) A 0.50-inch conduit (or more as required) shall be supplied and installed between the door contact and the pull box to allow for connection to the duct network.

2) Magnetic Contact: Surface

a) One or two surface magnetic contacts shall be installed on garage doors, gate barriers, and other entry points.

b) Unless indicated otherwise, and taking into consideration the environment, the security contractor shall install the surface magnetic contacts per the following guidelines:

(1) The contacts shall be solidly anchored using corrosion-resistant, tamper-resistant screws.

(2) Use of appropriate supports such as 0.25-inch steel plates (there should be no ground installations unless no other possibilities exist).

(3) The armored flexible cable supplied with the contact shall be solidly anchored to avoid being pulled out. It shall be connected to housing with tamper-resistant screws.

(4) In garage door installations, the contacts shall be arranged diagonally.

(5) The wiring shall (optionally) include an end-of-line resistor.

(6) A 0.50-inch conduit (or more as required) shall be supplied and installed between the door contact and the pull box to allow for connection to the duct network.

3) Electric Door Strike

a) An electric door strike shall be installed on some single or double doors. It shall optionally be equipped with one micro-switch to supervise the presence and locking of the lock latch inside the door strike. The door latch shall be identifiable for monitoring, independently of other monitored components.

b) The security contractor shall confirm the compatibility of the strike with the type of door and hardware. Furthermore, when the door strike is installed on an exterior perimeter door, a security plate shall also protect this door.

c) The security contractor shall be held responsible for the malfunction of or damage caused to doors or doorframes as a result of the installation of door strikes or other devices.

d) When required (for a double door), the security contractor shall connect the electric door strike using a power transfer cable.

e) Unless indicated otherwise, and taking into consideration the environment, the security contractor shall install the electric door strike in compliance with the following guidelines:

(1) The wiring shall include an end-of-line resistor.

(2) A 0.50-inch (or more as required) conduit shall be supplied and installed between the electric door strike and the pull box to allow for connection to the duct network.

(3) The electric door strike shall operate on a continuous low voltage of 12 Vdc.

4) Electric Lock

a) The electric lock shall be installed on some doors to control the locking and unlocking of the doors (similar to an electric door strike).

b) The electric lock shall meet or exceed the following specifications:

(1) Operate on a continuous low voltage of 12 Vdc.

(2) Have a “fail secure” function.

(3) Be suitable for the existing type of door, doorframe, and hardware.

c) The security contractor shall be held responsible for the malfunction of or damage caused to doors or doorframes as a result of the installation of door locks or other devices.

5) Electric Panic Bar with Electric Lock

a) The security contractor shall take into consideration that this equipment may be supplied and installed by others, but he shall be responsible for the interconnections.

b) The security contractor shall foresee the power supply for the panic bars with an electric lock.

6) Monitoring Strike

a) Some doors shall be equipped with monitoring strikes for confirming the action of the strike.

b) The security contractor shall be held responsible for the malfunction of or damage caused to doors or doorframes as a result of the installation of door locks or other devices.

c) Unless indicated otherwise, and taking into consideration the environment, the security contractor shall install the monitoring door strike in compliance with the following guidelines:

(1) The wiring shall include an end-of-line resistor.

(2) The monitoring strike shall be identifiable for monitoring, independent of other monitored components.

(3) A 0.50-inch conduit (or more as required) shall be supplied and installed between the monitoring strike and the pull box to allow for connection to the duct network.

7) Power Transfer Cable

a) Power transfer cables shall be installed on some devices to ensure operation or power continuity.

b) The power transfer cable shall meet or exceed the following specifications:

(1) Hidden in the frame.

(2) Tolerate low voltage.

(3) Be adaptable to the type of hinge or door pivot.

8) Solenoid Switch

a) The security contractor shall supply a reliable solenoid switch system (dry contact with appropriate wiring) that shall interrupt the electric current to command buttons of the electric motors used for garage doors.

b) In the case of a turnstile or motorized door, the solenoid switch shall be used for the normal operation of the door, based on the delay required, to ensure the passage of persons or carts.

c) In locations where additional appliances (such as chains or auxiliary pulleys) are necessary for the manual operation of the door during a power outage, the security contractor shall foresee a “dead bolt” mechanism that blocks the manual opening of the door disables the opening mechanism. These two actions shall be controllable from the control station.

d) The security contractor shall submit a diagram showing the operation of the solenoid switch to the general contractor for approval.

e) The solenoid switch shall be matched to the type of manual mechanism.

f) Unless indicated otherwise, and taking into consideration the environment, the security contractor shall install the solenoid switch using the following guidelines:

(1) A 0.50-inch conduit (or more as required) shall be supplied and installed between the solenoid switch and the pull box to allow for connection to the duct network.

9) Electromagnetic Lock

a) An electromagnetic lock shall be installed to control some doors. The electromagnetic lock shall meet or exceed the following specifications:

(1) Holding force of 1,500 lbs.

(2) Two status light indicators (red and green) shall indicate the lock’s power and adequate holding force.

(3) Integrated contact switch to supervise the adequate holding force.

(4) The electromagnetic lock shall operate on a continuous low voltage of 12 Vdc.

b) In addition to the integrated contact switch supervising the holding force, the door shall be equipped with a recessed magnetic contact for supervising the door status.

c) Unless indicated otherwise, and taking into consideration the environment, the security contractor shall install the electromagnetic lock in compliance with the following guidelines:

(1) The electromagnetic lock shall be securely anchored on the upper doorframe with manufacturer-recommended security bolts.

(2) Connections of the electromagnetic locks shall allow monitoring of adequate holding force, independently of other components that require

connection.

(3) The wiring shall include an end-of-line resistor.

(4) A 0.50-inch conduit (or more as required) shall be supplied and installed between the electromagnetic lock and the pull box to allow for connection to the duct network.

d) The security contractor shall be held responsible for the malfunction of or damage caused to doors or doorframes as a result of the installation of door locks or other devices.

e) All electromagnetic locks installed at emergency exits shall be connected to the panic bar controller or to a manual abort station, as required. The power supplies for the electromagnetic locks shall be connected to the building fire alarm system (supplied by a third party) to permit the de-activation of the electromagnetic locks in the event of a fire drill or a fire alarm.

f) The security contractor shall obtain authorization from local authorities before installing the devices. In addition, before final acceptance, he shall provide a written confirmation certifying that the installation has been executed per regulations.

g) Signs indicating emergency procedures, that shall be located near each door equipped with electromagnetic locks, shall be supplied and installed by the general contractor and shall conform to applicable codes and regulations.

10) Electric Panic Bar with Timer

a) A panic bar with electric contact, as well as control devices for panic bars, shall be installed on some doors designated as emergency exits in conformance of fire code regulations. In locations where a double door is installed, an additional panic bar shall be added.

b) The panic bars, control devices and the power transfer cables shall meet with or exceed the following specifications:

(1) Panic bar(s) equipped with an electric contact suitable for the door architecture.

(2) Electronic exit delay module with alarm contact and re-arming key switch including back box and accessories (two keys per cylinder).

(3) Wiring for delay activation monitoring (after 3 seconds) shall include an end-of-line resistor.

(4) Shall include an activation warning buzzer different than those on doors controlled with card readers or other devices.

(5) Embedded power transfer cables for panic bar connection.

(6) Signs indicating emergency procedures supplied and installed by the general contractor.

(7) Operation on a continuous low voltage of 12 Vdc.

(8) UL approved.

c) Unless indicated otherwise, and taking into consideration the environment, the security contractor shall connect the panic bars and install the controls in

compliance with the following guidelines:

(1) The panic bar control shall be concealed near the door.

(2) The warning buzzer for the panic bar control system shall be locally audible and sufficiently loud, taking into consideration background noise level.

(3) The re-arming key switch shall be connected so power can be restored to the electromagnetic lock, but it shall not permit the reverse operation.

(4) The warning buzzer location shall be chosen so that the buzzer can be heard in the targeted zone.

(5) The connection shall allow the power to electromagnetic lock to be removed in less than 15 seconds, or as required. The transmission of an alarm indicating that the power is removed is irreversible after 3 seconds.

(6) A 0.50-inch conduit (or more as required) shall be supplied and installed between the panic bar, the key switch, the panic bar control connection housing, the warning buzzer, and the pull box to allow for connection to the duct network.

(7) The security contractor shall be held responsible for the malfunction of or damage caused to doors or doorframes as a result of the installation of panic bars or other devices.

(8) The security contractor shall obtain authorization from local authorities before installing the devices. In addition, before final acceptance, he shall provide a written confirmation certifying that the installation has been executed per regulation.

(9) Signs indicating emergency procedures shall be located near each door equipped with electric panic bars. These signs shall be supplied and installed by the general contractor and shall conform to applicable codes and regulations.

11) Manual Abort Station

a) A manual abort station shall be installed on some doors designated as emergency exits to conform to requirements in fire code regulations and any other recommendations.

b) The manual abort station shall meet or exceed the following specifications:

(1) The color shall be different from other manual fire pull stations.

(2) The housing shall be appropriate to the station for a surface or recessed installation.

(3) Signs indicating emergency procedures shall be supplied and installed by others.

(4) Double pull.

c) Unless indicated otherwise, and taking into consideration the environment, the security contractor shall connect the manual abort stations in compliance with the following guidelines:

(1) The manual abort station shall be solidly anchored on the side opposite the door hinges.

(2) The connection shall allow the power to be removed from the electromagnetic lock and transmit an alarm indicating use of the manual abort station.

d) The security contractor shall obtain authorization from local authorities before installing the devices. In addition, before final acceptance, he shall provide a written confirmation certifying that the installation has been executed per regulation.

e) Signs indicating emergency procedures shall be supplied and installed near each door with a manual abort station by the general contractor. These signs shall conform to applicable codes and regulations.

12) Exit Request Devices

a) There are two types of exit requests devices: an infrared sensor and a button. An exit request device provides a function equivalent to a reader, but without defining the user. A description of each device follows.

b) The infrared exit request device shall meet or exceed the following specifications:

(1) Operation on a continuous voltage of 12 Vdc.

(2) LED light indicator.

(3) Adjustable range area.

c) The exit request button device shall be installed on a strong aesthetic finishing plate.

d) Unless indicated otherwise, and taking into consideration the environment, the security contractor shall install exit request devices in compliance with the following guidelines:

(1) The wiring shall include an end-of-line resistor.

(2) The device shall be suitable for the type of door or window where it is installed.

(3) The location shall be chosen to deter involuntary or fraudulent activation.

(4) A 0.50-inch conduit (or more as required) shall be supplied and installed between the exit request device and the pull box to allow for connection to the duct network.

13) Key Switch

a) A key switch shall be used for the following purposes:

(1) A malfunction key switch allows the immediate or direct deactivation of an electromagnetic lock in the event of system failure. The key switch shall be equipped with a tamper contact that shall transmit an alarm to the monitoring station.

(2) An access key switch allows the temporary deactivation of the supervisory systems of a controlled door to permit access without

generating an alarm (authorized access). The security contractor shall provide the electronic delay module and necessary accessories with the key switch. Where the key switch is used to open a motorized garage door, it shall be used with a command button panel (Open, Stop, Close) that can be used with limited time delays. This function shall also be available on a programmable schedule. When the key switch is used for door access authorization, it shall be determined whether it is an exit or an entry. It shall be possible to activate and deactivate the key switch based on a programmable schedule to authorize normal access without causing an intrusion alarm. The switch shall be equipped with a tamper contact that shall transmit an alarm to the monitoring station.

b) The key switch shall be equipped with an LED to indicate the state of the function.

c) The key switch shall meet or exceed the following specifications:

(1) Operate with a mortise cylinder with five pins.

(2) Two keys per cylinder.

(3) Momentary operation or other, as necessitated by the application.

(4) Illuminated with two status indicators (red and green lights), except for the fault interrupter.

(5) Aesthetic plate with security screws.

(6) Appropriate housing.

d) Unless indicated otherwise, and taking into consideration the environment, the security contractor shall install key switch devices in compliance with the following guidelines:

(1) The device shall be installed on the side of the door opposite the hinges.

(2) The wiring shall include an end-of-line resistor.

(3) The key switch shall be equipped with a tamper contact that shall be connected independently so that the point of supervision can be distinguished from the use of the switch.

(4) A 0.50-inch conduit (or more as required) shall be supplied and installed between the key switch and the pull box to allow for connection to the duct network.

14) Man Trap

a) When a man trap function is specified, the security contractor shall foresee all the necessary accessories to ensure and maintain the integrity of this function.

b) The security contractor shall show the general contractor that the operation of the man trap is compliant with the requirements.

15) Glass Break Detector

a) The detection of glass breakage shall be suitable to the environment, of DOUBLE TECHNOLOGY type, and shall meet or exceed the following

specifications:

(1) Shall provide detection at up to ±9 yards

(2) Shall include a tamper switch

(3) Shall be illuminated with a LED display

(4) Shall operation on a voltage of 12 Vdc

(5) Shall include an alarm memory

(6) Shall have an adjustable sensitivity

b) The security contractor shall show the general contractor that the choice and number of devices meets the protection specifications, while not causing false alarms due to environmental factors or other equipment used by the general contractor.

c) Unless indicated otherwise, and taking into consideration the environment, the security contractor shall install glass break detectors in compliance with the following guidelines:

(1) The glass break detector shall ensure detection at a minimum height of 3 yards above ground level and accessible traffic areas.

(2) The glass break detector shall be securely anchored so it cannot be removed without breakage or the use of special tools.

(3) The glass break detector shall be equipped with a tamper contact connected separately to distinguish between an intrusion alarm and a tamper alarm.

(4) There shall be an option for clearing the alarm memory.

(5) The wiring shall include an end-of-line resistor.

(6) A 0.50-inch conduit (or more as required) shall be supplied and installed between the glass break detector and the pull box to allow for connection to the duct network.

16) Motion Detectors

a) The motion detectors shall include a double technology (infrared / microwave sensor) and shall meet or exceed the following specifications:

(1) Shall include infrared and microwave supervision

(2) Shall include a tamper contact

(3) Shall include an illuminated LED display

(4) Shall effectively cover the required area, based on environment requirements. The detectors may be ceiling or wall mounted.

(5) Shall operate on a voltage of 12 Vdc.

b) Unless indicated otherwise, and taking into consideration the environment, the security contractor shall install motion detectors in compliance with the following guidelines:

(1) The motion detector shall be installed and oriented so that the area of coverage meets with the general contractor’s criteria.

(2) The motion detector shall be equipped with a tamper contact connected separately to distinguish between an intrusion alarm and a tamper alarm.

(3) The wiring shall include an end-of-line resistor.

(4) A 0.50-inch conduit (or more as required) shall be supplied and installed between the motion detector and the pull box to allow for connection to the duct network.

17) Strobe Lights

a) A strobe light shall be installed near some emergency devices. The strobe light shall meet or exceed the following specifications:

(1) Shall operate on continuous voltage of 12 Vdc

(2) Shall have a clear color

(3) Shall have a pulsation frequency of 80 pulses per minute

(4) Shall be surface mounted on a ceiling

18) Siren Alarm

a) A siren shall be installed near some emergency devices. The siren shall meet or exceed the following specifications:

(1) Shall operate on continuous voltage of 12 Vdc

(2) Shall consume at most 30 W power

(3) Shall emit a variable tone or pulsation

(4) Shall be mounted in a metal housing

19) Panic Switch

a) The panic switch shall meet the following specifications:

(1) Shall be designed to avoid false alarms

(2) Shall be resettable with a key

b) Unless indicated otherwise, and taking into consideration the environment, the security contractor shall install panic switches in compliance with the following guidelines:

(1) The wiring shall include an end-of-line resistor.

(2) The device shall simultaneously transmit an alarm to the controller and to a panel for receiving and transmitting priority alarms.

(3) The device shall be hidden and easily accessible when it is installed at a workstation.

(4) The location of the device shall be coordinated with the general contractor based on the operations.

20) Electric Door Controller

a) An electric door controller shall be installed on some doors to open or close them automatically. The door controller shall meet or exceed the following specifications:

(1) Shall operate on a voltage of 110 VAC with low voltage control.

(2) Shall be suitable for the type of door and frame.

(3) Shall be surface mounted.

(4) Shall permit opening the door with a swing range of 110–130 degrees.

21) Door Stop

a) The security contractor shall make connections to certain devices to activate the closure, on demand, of certain emergency doors.

b) The power source to the doorstops shall be disabled to activate the automatic closure of the doors.

d. Control Station

1) Computers: Server and Workstation

a) The server shall process and record all the data acquired by the access controllers.

b) The system shall function without the server being logged onto.

c) The server software shall be fully operable in a virtual environment such as VMWare ESXi or higher.

d) The workstation software shall be browser based and shall not require ActiveX or other plug-in. The software shall be written using only HTML and JavaScript language.

e) There shall be no installation required at the workstation. The user will run the software by browsing the server with an industry standard browser.

f) The system will support the most recent releases of Microsoft Internet Explorer, Google Chrome and Mozilla Firefox at a minimum.

g) The primary computer shall be equipped with the following minimum requirements:

(1) Windows® Vista Professional (with Service Pack 3)

(2) Processor at 2 GHz or faster

(3) 2GB RAM

(4) 120GB hard disk

(5) 1 USB port (or additional parallel port for badging)

(6) 19-inch, 1280 x 1024 true color monitor

(7) Standard keyboard

(8) Standard mouse

(9) Network Interface Card (NIC)

h) The secondary computer shall be capable of normal internet browsing.

i) The computers shall be capable of communicating with numerous access controllers, terminals, or other computers in a multitasking/multi-usage mode or network mode.

4. Communication Network and Cable

a. Cabling Conduits
    1) The general contractor shall supply and the security contractor shall install the primary and secondary conduits in compliance with the following specifications:
        a) In the event that the power voltage is superior to 48 V or a hazardous condition exists, the following shall be completed.
        b) The wiring shall not be hidden in the divisions or the walls.
        c) All conditions shall be subject to codes or norms in force.
        d) If there are visible conduits, it shall be possible to use surface conduits. An authorization to do so shall be obtained prior to installation.
        e) The use of flexible conduits shall be authorized in the case of descent into a division or in areas that are difficult to access.
        f) The sizing of the conduits shall respect a maximum fill of 40%.
        g) The general contractor shall use cable paths or designated spaces for cable passage.
    2) The security contractor shall coordinate the planning and installation of the conduits with the general contractor.
    3) The security contractor shall verify that the size of the conduits meets the aforementioned requirements and is compatible with the needs. The security contractor shall present any conduit network modifications and adjustments to the general contractor for approval prior to installation.

b. Cables
    1) The general contractor shall supply and the security contractor shall install the power cables, control cables, and other cables for the primary and secondary networks.
    2) All wires, cables, and connectors shall bear the same identification number at both ends.
    3) The cabling required for the readers shall be 6 conductors, 22 gauge.
    4) If the use of a terminal block is required, the cables shall be equipped with a fork connector or ring.
    5) All spliced connections shall be soldered and indicated on the mechanical plan before soldering. Splices shall be covered with shrink tubing.
    6) Cables in housings shall be securely attached with “tie wrap” bindings.
    7) All cables used for the installation shall meet the manufacturer recommendations.

c. Equipment Supplied by Others

Some specific equipment may be provided and installed by other contractors. The security contractor is responsible for the coordination of his work with that of the other contractors. The security contractor is responsible for the interconnection and shall test the operation of all equipment with that installed by other contractors.

PART 3- EXECUTION

**3.1** INSTALLATION

A. All wiring shall be in accordance with the National Electrical Code, Local Codes, and article 760 of NFPA Standard 70. All wiring sizes shall conform to recommendations of the equipment manufacturer, and as indicated on the engineered shop drawings.

B. All wire shall be UL Listed CL2 for limited energy (300V) applications and shall be installed in conduit. Limited energy MPP wire may be run open in return air ceiling plenums provided such wire is UL Listed for such applications and is of the low smoke producing fluorocarbon type and complies with NEC Article 760 if so approved by the local authority having jurisdiction.

C. No AC wiring or any other wiring shall be run in the same conduit as security alarm wiring.

D. All wire shall be installed in an approved conduit/raceway system (except where permitted by NEC and the local authority having jurisdiction). Maximum conduit "fill" shall not exceed 40% per NEC.

E. Minimum conduit size shall be 3/4" EMT. Install conduit per engineered shop drawings.

F. Systems utilizing open wiring techniques with low smoke plenum cable shall provide conduit in all inaccessible locations, inside concealed walls, all mechanical/electrical rooms, or other areas where wiring might be exposed or subject to damage.

G. All vertical wiring and all main trunk/riser wiring shall be installed in a complete raceway/conduit system. All riser boxes shall be adequately sized for the number of conductors transversing the respective box as well as the number of terminations required.

H. Network Connection Cable: Provide by data contractor a 4 pair Category 6 data cable from the Security closet 30314 patchpanel to the IDF.

I. All plenum wiring is to be installed parallel and perpendicular to the building structure. Install wiring tight up against structure for protection. Cable shall be bundled on a maximum of 2'-6" and secured to the structure at a maximum of 5' on center. Bundling and support shall be with plenum rated cable ties.

J. Contractor is required to provide all mapping and software configuration required to operate system as per manufacturer’s recommendations.

**3.2** CABLE PATHWAYS

A. Cable Support:
   1. All wire not installed inside conduit or a designated cable tray system shall be installed in a dedicated cable support system for the entire run of each cable. Including, but not limited to service loops.
      a. Approved Cable Support Product:
         PANDUIT® Corporation J-MOD™ modular support system (sized

appropriately for the number of wires being installed. Reference the manufacturer's specifications for the suggested maximum cables per support size.

2. The approved cable support system shall be attached directly to the building steel at a serviceable height. In the event that the building steel is not 5' of the finished ceiling, the contractor shall provide a dedicated threaded rod extending within 5' of the finished ceiling and mount the J-MOD™ support hook to the treaded rod.
3. J-MOD™ cable support shall be installed at a maximum of 5' on center.
4. All cable installed shall be attached to the J-MOD™ support system with plenum rated Velcro and a plenum rated Velcro tie shall be installed between each J-MOD™ cable support to keep wires neatly bundled throughout the entire run. Velcro straps will only be allowed to be used inside the control panels as required to manage the wires within each type of panel.
5. ABSOLUTELY NO CABLE, NOT INSTALLED IN CONDUIT, WILL BE ALLOWED TO BE ATTACHED DIRECTLY TO THE BUILDING'S STEEL OR SUPPORTED IN ANY OTHER METHOD THAN THAT STATED ABOVE.
6. IT IS THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR TO COORDINATE WITH ALL OTHER TRADES ON THE PROJECT TO INSURE THAT THE PATHWAY OF THIS SYSTEM DOES NOT INTERFERE WITH THE INSTALLATION OF THE OTHER TRADES AND TO PREVENT THE INSTALLED PRODUCT OF OTHER TRADES FROM PUTTING STRAIN ON THE INSTALLED WIRING.

B. Conduit / Raceway:
1. All wire shall be installed in an approved conduit/raceway system (except where permitted by NEC and the local authority having jurisdiction). Maximum conduit "fill" shall not exceed 40% per NEC.
2. Conduit and raceway system shall be installed as specified under the general electrical section of the specifications, and per NEC.
3. Minimum conduit size shall be 3/4" EMT. Install conduit per engineered shop drawings.
4. Systems utilizing open wiring techniques with low smoke plenum cable shall provide conduit in all inaccessible locations, inside concealed walls, all mechanical/electrical rooms, or other areas where wiring might be exposed or subject to damage.
5. All conduit ends shall have a protective bushing to prevent cable damage. BUSHINGS MUST BE INSTALLED PRIOR TO INSTALLING CABLE. CUTTING BUSHING TO INSTALL AROUND INSTALLED CABLES WILL NOT BE ACCEPTED.

**3.3** WARRANTY

A. All provided and installed infrastructure and devices shall be warranted against defects in materials and workmanship for a period of one (1) year from the date of substantial completion.

**END OF SECTION**

**SECTION 28 40 00 - ELECTRONIC CONTROL SYSTEM**

PART 1 - GENERAL

1.1 DESCRIPTION

A. General:

1. Furnish all labor, materials, tools, equipment, and services for all electronic control systems as indicated in accordance with provisions of Contract Documents.

2. Completely coordinate with work of all other trades.

3. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.

4. See Section 28 00 00 for Electronic Systems General Requirements.

5. See Division 1 for General Requirements.

6. All new and existing panic buttons must be tested, working and automatically project spot monitor output camera view from the camera overseeing the activated panic button location.

7. All new and existing detention intercom stations must be tested, working and must give the control operator the ability to zoom to and view the camera which oversees the activated Intercom location.

8. All programming, testing and integration shall be performed by MCS.

B. Related work:

1. Intercom and Paging Systems: Section 28 51 23.

2. Touch Screen Control and Management System: Existing Equipment.

3. Video Surveillance System: Section 28 73 30.

1.2 BASIS OF DESIGN

A. The electronic security system described within the specifications and drawings shall function as an integrated system. The control and monitoring stations shall function as a single control

point, appearing to function as a single system. Although the system is made up of several sub-systems, they shall be integrated in both physical and electronic manner to achieve a single system presentation to the operator.

B. The electronic control system is the central point of the integrated system. It performs all the logic and switching functions for the system as it communicates discreetly or through data interfaces to touch screens, control station, field devices (i.e. locks, intercoms, lights), and related systems. The system is made up of a single Programmable Logic controller (PLC) connected to a network (ECSN).

1. The intercom and paging switching system(s) shall be controlled via the ECS. The amplifier output audio bus shall be switched via audio relays that are part of, and controlled by the ECS.

2. The touch screen control station will generate commands to the ECS and receive status from the ECS. Communication between the touch screen control stations and the ECS shall be via the security network (ECSN).

3. Control of devices such as lights, receptacles, etc. shall be provided via control relays. These control relays shall in turn operate control relays provided under the Division 16 work.

4. Non-Detention doors will be controlled from the access control system. Detention doors and the doors to the courtrooms shall be controlled from the electronic control system (PLC) with secondary control provided by the access control system. The Electronic control systems shall monitor the status of the all doors.

5. Personal alarm system receivers shall be connected to inputs of the PLC. Alarm status and location shall be reported via the ECS in conjunction with the video graphic touch screens.

6. Switching control of video images shall be from the ECS. Video images shall be displayed, and video recorders controlled on the basis of selected inputs (i.e. intercom acknowledge, personal alarm, motion detection.

7. Miscellaneous devices (i.e. motion detectors, call buttons, duress buttons, personal alarm receivers) shall be configured as inputs to the ECS with status displayed on the touch screen control stations.

## 1.3 QUALITY ASSURANCE (SEE SECTION 80000)

## 1.4 SUBMITTALS (SEE SECTION 28 00 00)

A. Electronic Control System: Section 28 40 00.

1. Project data: Description of system operation indicating purpose and capabilities of each component of system with functional system diagram indicating all interfaces to other

systems. Description shall include, and call attention to, all variances from the contract documents. Sample of each maintenance report.

2. Certification: Submit written certification that control wiring and locking system consoles and panels have been coordinated with security hardware. (Section 11191). No submittal review will be conducted until receipt of certification. Certification letter shall read as follows:

"(Manufacturer/Supplier name) has reviewed all electrical characteristics and control wiring requirements of all electric operated security devices, i.e., electric locks, position switches, door operators to be installed in this project and has incorporated all modifications and revisions required to provide a completely coordinated and functional control system."

3. Shop drawings: Complete installation drawings including system diagrams and terminal point to terminal point wiring diagrams or schedules.

4. Product data: Technical data sheets and specifications for each component.
5. Testing: Test reports of fiber optic cable installation.

1.5 WARRANTY (SEE DIVISION 1)

1.6 OPERATING AND MAINTENANCE DATA (SEE SECTION 28 00 00)

PART 2 - PRODUCTS

2.1 GENERAL

A. Acceptable manufacturers.

1. Networking products
   a. Base: Hirschmann, Phoenix Contact,

2. Programmable Logic Controller (PLC).
   a. Base: Omron, GE Fanuc, Schneider Electric/Modicon, Allen Bradley

3. Power Supplies:
   a. Class 1: Power One, Sola, Phoenix Contact, IDEC
   b. Class 2: Power One, Sola, Phoenix Contact, IDEC

4. Relays:
   a. Base: Schrock, Allen Bradley, General Electric, Potter & Brumfield, Magnecraft, IDEC, Phoenix Contact, Finder

5. Other manufacturers desiring approval comply with Division 1.

B. Systems:

1. Provide complete coordinated systems for operation, monitoring and control of systems as indicated on drawings and specifications.

2. Include push-to-test function for lamp test on each panel. Provide circuitry as required for protection of all components.

3. Provide all wire, cable, terminal blocks, and fittings.

4. Provide terminal strips or connectorized plugs for connection of all incoming field wiring.

5. All low voltage wiring in consoles shall be Class 1 or Class 2 power limited circuitry in strict accordance with NEC Article 725 except power cords for amplifiers, monitors, etc. Maintain separation of conductors as required.

6. Provide wire restraint and bundling to prevent strain on devices.

7. Terminate all wiring on terminal blocks for connection to field wiring. Label all terminal
strips to coordinate with installation drawings.

8. Wiring system shall be Class 1 for both control and indication. Wiring from touch screen to equipment cabinet may be Class 2. Maintain separation of conductors per NEC Article 725.

9. Wiring and diagrams shown on drawings are provided for logic description only. Verify and install all wiring from approved shop drawings and installation drawings from manufacturers.

10. The interaction time between system input at the touch screen and the activation of a field device shall not exceed 0.5 second. Similarly, the interaction time between field input device and display on the touch screen shall not exceed 0.5 second. For group operations such as emergency release and group unlock, the interaction time between system input at the touch screen and the activation of the last field device of a group shall not exceed ten (10) seconds.

## 2.2 PROGRAMMABLE NETWORK MANAGEMENT SWITCH

A. The Network Management switch (NMS) shall be made up of a single PLC and CPUs of other systems in a distributed processing system. PLC shall be connected to the NMS for intercommunications among PLC in the system and interface to Touch Screen stations (TS), Administration Station (ADS), File Server (FS), and other related integrated system CPUs.

1. Network Switches shall be of heavy duty design with fault tolerance by means of redundant power supplies. Switches shall consist of 100 Mbps backplane with multiple 10BaseT ports for connection to PLCs and 100 Mbps port for connection to other integrated system CPUs. Each 10 Mbps port shall have full time 10Mbps availability from the backplane. LED indicators shall be provided for each port to include power, data, collision, link status. Contacts for remote alarm reporting shall be provided for such fault messages. Contacts for remote alarm reporting shall be displayed as a system alarm on the touch screen control and management system.

2. Network Management Switches shall be designed for redundant ring structures in accordance with IEEE 802.1 D with Network switches as specified and be fault tolerant by means of redundant power supplies connections. The Network Management shall supervise the ring and shall be responsible for detection and dynamic bypass of network fault in 3 seconds or less. Modules for interface to the network shall be provided. LED indicators shall be provided for each port to include power, data, collision, link status. Contacts for remote alarm reporting shall be provided for such fault messages. Contacts for remote alarm reporting shall be displayed as a system alarm on the touch screen control and management system.

3. Network Switches:
   a. Network switches shall be modular and allow the use of fiber, copper or hybrid modules containing Ethernet ports.
   b. Network switches shall be expandable to 24 interface ports to meet network requirements.
   c. All network switches interfaces shall be capable of automatic detection of 10 Mbps or 100 Mbps data transmission rates.
   d. Network switches shall be configurable via web-based management, SNMP, Telnet or locally via an RS-232 (V.24) interface.
   e. Model:
      1) Hirschmann Compact Industrial Switches (Rail Switch)
      2) RS20 Series
      3) Hirschmann Modular Industrial Switches (MICE)
      4) MS20 Series
      5) Phoenix Contact Modular Managed Swtiches (MMS)
      6) FL SWITCH MM HS Head station and associated modules
      7) Phoenix Contact Managed Compact Switch (MCS)
      8) FL SWITCH MCS Series

4. The NMS shall include connections to each PLC, TS, ADS, FS, and other integrated system CPUs.

5. Connect to indicator contacts (NC) on each network switch for remote trouble annunciation to Touch Screen Control and Management System

## 2.3 PROGRAMMABLE LOGIC CONTROLLER (PLC)

A. The Programmable Logic Controller shall be general purpose in nature and not custom designed for specific application. The PLC shall become location and operation specific upon installation of input/output modules and programming. The PLC shall be a standard product of a single manufacturer engaged in production of PLC's for industrial applications for a minimum of ten (10) years.

B. PLC shall control all input/output functions of the touch screen station and associated remote devices for the area served. PLC shall provide interface between the touch screen and related systems. PLC shall be furnished with sufficient processor capacity and memory to meet or exceed interaction time as specified.

C. Racking System: Provide assembly with mounting slots for all modules required for electronic

control system. Assembly shall include latching clamps or hold-down screws to secure modules in slots, dead front cover for covering I/O wiring terminals, and wire routing clips.

1. Where multiple racks are required, provide bus expander unit to expand li/0 capacity.

2. Provide rack system power supply as required for final system configuration.

3. Provide 10% spare input and 20% spare output capacity in each rack assembly.

D. Processor: Provide processor module for installation in rack assembly. Processor shall include comprehensive self-test and self-diagnostic capabilities with dry contacts for remote monitoring in the event of controller fault.

1. Provide instruction set for control of quantity of input and output points as required by contract documents.

2. This project requires a minimum of one (1) processor plus spares as indicated.

3. Provide real time clock with accuracy within 1 second per day at 25 degrees C, 16 seconds per day over full temperature and humidity range.

4. Provide basic control logic instructions including but not limited to the following functions to provide operating features required by contract documents.
   a. Logical AND, OR, XOR AND INVERT
   b. On/Off Delay
   c. Counters
   d. Timers
   e. Sequencers
   f. Four Function Math (Add, Subtract, Multiply, Divide)
   g. BCD Input and Output
   h. Contacts
   i. Coils
   j. Block Instructions (conditional jumps)
   k. Group Logic Functions
   1. Array Math Functions

5. Provide memory capacity for control system as required by contract documents. Include a minimum of 20% spare memory capacity. Install lithium battery for memory support in the event of power failure.

6. System software shall be stored in EPROM. The operating software and fixed data base shall be stored in battery backed RAM.

7. Provide system trouble output contact for monitoring. Output shall occur upon any of the following conditions:
   a. Low battery
   b. Processor trouble
   c. Rack system trouble
   d. Enclosure open
   e. Power supply trouble

E. Input/Output Modules: Provide digital or analogue input/output modules as required for control system and field device connected. Modules shall plug in to rack assembly and contain 32 or 64 optically isolated inputs or outputs.

1. Provide red LED's indicators for "on" function.

2. Modules shall be 12-24 VDC for interface to electronic relay control.

F. Network Interface Modules: Provide module in each PLC for communications on the Ethernet ECSN.

G. Communication Modules: Provide capability of driving local I/O, where local is defined as up to one hundred (100) feet from the control unit, without the need for further intelligent interface modules or additional power supplies.

H. Rack Power Supply: Provide DC power supply to rack assembly to power all modules mounted in the rack. Connect to rack with power supply cable.

1. Include battery backup power to maintain random access memory (RAM) in the processor during power outages or power shutdown for a period of up to twelve (12) months.

## 2.4 PROGRAMMING

A. Programming of electronic control system shall be via the network. The programming software may reside on the Administrative Station of the Touch Screen Control and Management System, or provide a separate and dedicated computer for such purpose.

B. Provide software support for the Programmable Logic Controllers. Include capability for the following minimum functions:

1. Password security.

2. On-line program development and monitoring.

3. Enter PID loop programming parameters

4. Screen prompted processor programming instructions.

5. Off-line processor program development.

6. Copy all or part of off-line memory to processor memory and vice versa.

7. Processor programming and monitoring by I/O labels.

8. Advanced processor I/O diagnostics using TIME SCAN function.

9. Coil verify capability.

10. Annotated program documentation, with 18 character I/O labels and full page rung comments.

C. Report generation: Provide programming as required to meet requirements of Section 13833: Touch Screen Control and Management System

2.5 SYSTEM CONTROL AND MONITORING FUNCTIONS
(See Sections 13833 for complementing display functions)
General: Each remote electrically operated door shall be provided with both a normal means of operation and an emergency means of operation. Normal operation of a door will allow relocking without additional action by the operator. Emergency operation of a door will unlock a device and maintain the device in an unlocked position until an additional action is performed by the operator.

A. Single Swing Door Lock with no-holdback feature requires continuous input to maintain unlocked.

1. Control: Output unlock command causes door to unlock. Door will relock upon release of command

2. Indication: Non-secure condition of door from lock bolt position or door position switch will open the input circuit.

B. Single Swing Door Lock with no-holdback feature requiring momentary input.

1. Control: Output unlock command causes door to unlock. Lock bolt is held electrically retracted for a preset period of time (set at 3 seconds).

2. Indication: Non-secure condition of door from lock bolt position or door position switch open the input circuit.

C. Single Swing Door Lock with mechanical holdback (standard lock configuration.

1. Control: Output unlock command causes door to unlock. Lock bolt is held mechanically retracted until door is opened. Door relocks when door is reclosed.

2. Indication: Non-secure condition of door from lock bolt position or door position switch will open input circuit.

D. Electric Sliding Door/Gate

1. Control: Output OPEN command shall cause the door/gate to open until limit switch is opened or a STOP or CLOSE output command is received. Output CLOSE command shall cause the door/gate to close until limit switch is opened or an OPEN or STOP output command received.

2. Card Reader Control:
   a. At controlled and monitored sliding doors, presentation of a valid card shall cause door to open to a full open position, pause for one second and then recluse.

b. When door is in an open position (not secure), presentation of a valid card shall cause the door to pause for one second and close.

3. Indication: Non-secure condition of door/gate from limit switch or door position switch will open input circuit.

E. Door Monitor

1. Control: None.

2. Indication: Non-secure condition of door from lock bolt position or door position switch shall illuminate a red LED.

F. Door Alarms:

1. Door prop: Controlled/monitored door remains unsecured longer than the preset timer

2. Unauthorized Access: Controlled/monitored door becomes unsecured by means other than the control system.

a. Unauthorized Access alarms shall be programmed with a delay to prevent false alarm from a door bounce effect.

G. Interlock Override

1. Control: Output INTERLOCK OVERRIDE command shall allow door to unlock/open despite part of interlock group.

2. Indication: None.

H. Intercom or Paging

1. Control: Output AUDIO command causes previous audio command to be canceled (if necessary), zone select and audio "Listen" to be activated.

2. Indication: Input from local intercom call push button initiates call request.

I. Intercom Call

1. Control: Reset of call via Alarm Silence and Alarm Reset functions.

2. Indication: Input from local intercom call push button initiates call request.

J. ON/OFF Control

1. Control: Output of ON command turns on lights/receptacles, devices or equipment as indicated. Output of OFF command or removal of ON command turns off lights/receptacles, or devices or equipment. Type of off control dependent on type of relay used.

2. Indication: Input from relay indicates contact status.

K. System Alarm: All system alarms shall be connected to NC contacts where provided.

1. Control: Reset of alarm via Alarm Silence and Alarm Reset functions.

2. Indication: Input from alarm contact shall open or close the circuit.

L. Provide interface between ECS and Access Control System to enable control of selected doors by both systems.

1. Electronic Control System Enable/Disable and Override:
   a. The Access Control Panel door output controls shall be connected as inputs to the Programmable Logic Controller for door control. The Access Control System outputs SHALL NOT be directly connected to detention locks or devices unless specifically indicated otherwise.
   b. The PLC control for any door shall always be able to override a command from the Access Control System.
   c. For doors that are connected to both the PLC and to the Access Control System, door control commands, status and alarms shall be recorded by the Access Control System — in addition to being monitored/ controlled by the PLC.

   d. When Enable function located on the control station is depressed doors can be open by a card reader. The signal from the card reader will go to the local access control panel for evaluation if access through that door will be granted or denied based on access control system defined criteria. If access is granted by the Access Control System, then an output control signal shall be transmitted from the local access control panel to a PLC input. If the PLC logic determines that access is authorized, then an output signal shall be provided from the PLC I/O that causes the door to unlock or open.
   e. If the card reader has been DISABLED from the control station, the PLC shall ignore any input signal received from the Access Control System (through any means, such as card reader, REX, or operator command from an ACS workstation) requesting any door controlled by that control station be opened.

## 2.6 RELAY INTERFACE

A. Provide relay interface between control system and all controlled devices.

1. Wire Connections: Wires shall be attached to the relays by means of cable-clamping terminal block activated by a screw. Connections shall be gas-tight and the terminal block shall be fabricated of non-ferrous, non-corrosive materials.

2. Equipment: relays shall include an integrated label holder that can be used to mark the device. Relays shall have indication of operation by way of an LED (Light Emitting Diode). Relays shall incorporate a free-wheeling diode to eliminate inductive kick-back. Isolation voltage of 4000 kV, 50 Hz, 1 minute shall be provided between input and output.

3. Provide current overload protection, surge suppression, LED indication of status, and troubleshooting features.

4. Relays: Electro-mechanical type, single or double pole, double throw.
   a. Current rating: 125% of inrush current rating of device controlled, but not less than 10 amps. Rating for pneumatic lock relays not less than 3 amps.
   b. Coil Voltage: 24 VDC or as required by application.
   c. Contact voltage: 24 VDC or 120 VAC as required for application.
   d. Isolation: 2500 VAC.

5. Provide surge protection on load side of each relay connected to a locking device, from normally open contact to ground

6. Provide individual overcurrent protection (fuse, circuit breaker) for each relay serving an electro-mechanical locking device to protect relay and system circuitry from a short circuit failure at the lock.

7 Where relay systems are made up of modular components for DIN rail mounting, all wiring points and plug connections shall be "touch safe" with no live voltages in accordance with IEC 529.
   a. Mounting: all relays shall have integral mounting brackets to attach to 35mm DIN-rail conforming to DIN EN50022.
   b. Wire Connections: wires shall be attached to the relays by means of cable-clamping terminal block activated by a screw. Connections shall be gas-tight and the terminal block shall be fabricated of non-ferrous, non-corrosive materials.
   c. Equipment: relays shall include an integrated label holder that can be used to mark the device. Relays shall have indication of operation by way of an LED (Light Emitting Diode). Relays shall incorporate a free-wheeling diode to eliminate inductive kick-back. Isolation voltage of 4000 kV, 50 Hz, 1 minute shall be provided between input and output.

8. Integrated boards specifically designed for detention equipment control systems will be considered under limited conditions.
   a. Boards must be in production for a minimum of 5 years without substantial modification.
   b. Company must be operating a minimum of 10 years under the same name.
   c. Boards shall be stocked and available for next day shipping.
      1) Trentech: 248 Relay Board
      2) Southern Steel Co: 8410/16810 Relay Board
      3) STI: DRP-16/DRP-24 Door Relay Panel

B. Provide relay interface between electronic control system and all other Divisions of work. Relay interface shall be programmed to meet the requirements of the controlling device of the related trade. For momentary double throw control, provide programming for alternate action.

1 Relays: Electro-mechanical type, single pole.
   a. Current rating: 4 amps.
   b. Coil Voltage: 24 VDC
   c. Contact voltage: 12 VDC or as required for application.

2 Controlled circuits include:
   a. Lights
   b. Receptacles

c. Water Control Valves
d. Inmate Telephones

3. Provide interface terminal block for termination of control conductors by related Division of work.

C. Label all relays and terminations with designations to match installation and maintenance drawings.

## 2.7 PERSONAL ALARM

A. Personal duress alarm receivers shall be provided as indicated on drawings.

B. Power for the receivers shall be generated and distributed by the electronic control system. The electronic control system shall monitor the trouble and the alarm contacts of each receiver.

C. Activation of a transmitter shall latch in a continuous transmit position until reset and shall transmit a dual ultrasonic frequency in a preset modulation pattern.

D. The receiver shall activate a dry contact closure to be connected to the electronic control system.

E. An audible and visual alarm shall be indicated on the control station(s).

F. Where receivers are located in dayrooms, activation of an alarm shall disable local control stations and card readers used for door control. Where speakers are located in the alarmed area, a call shall be initiated on the intercom system to allow audio monitoring. Where video surveillance is provided in the alarmed area, an alarm shall be initiated to the video equipment for selection of camera upon acknowledge of intercom. Where video digital recording is provided, the associated camera shall be routed to the digital recorder for recording purposes.

G. Transmitters
1. The transmitters shall be of light weight construction of durable materials. A pocket/belt clip shall be an integral part of the unit. The transmitter circuitry shall be made of solid state circuitry and contain a long life battery (furnished with the transmitter) providing a minimum of 30 hours of transmitting time under normal operating conditions.
2. The transmitter shall activate by depressing a button or similar device that will latch in a continuous transmit position until reset. Upon activation the transmitter shall transmit a dual ultrasonic frequency in a preset modulation pattern.
3. Furnish fifty (50) complete transmitters with belt holsters.

H. Receivers
1. The receiver shall be mounted on a standard electrical box with security fasteners. The receivers shall be of solid state circuitry and operate on system voltage. A LED shall be an integral part of the unit and illuminate upon receipt of the transmitted signal.
2. The receiver shall activate and generate an alarm pulse to the central processor unit upon receiving both ultrasonic frequencies in a pre-set modulation pattern in a given time frame.

I. Acceptable manufacturers:
1. Base: Perimeter Products PAS-120, Fremont, CA
2. Other manufacturers desiring approval comply with Division 1.

## 2.8 DURESS ALARM

A. Duress Alarm Call Stations

1. Furnish and install a pushbutton switch at duress locations as shown on drawings. Switch shall be flush mounted in a single gang box with an engraved single-gang stainless steel faceplate.

2. When switch is momentarily depressed, the system shall cause the duress alarm warning light for that area to illuminate, visual and audible annunciation at the designated control station, and printing on the system terminal.

3. Pushbutton switch shall be industrial type switch with red mushroom head and integral key reset switch. Engrave plate with "PUSH FOR HELP".

4. Key activated reset switch on Duress Call-In Station shall for deactivate Duress Call-In and extinguishing Duress Alarm Light.

5. Model:
   a. Telemecanique ZB2-BS14
   b. Dortronics Systems Inc. 5210-MP23/KR/L1/E2

**B.** Duress Alarm Warning Lights

1. Furnish and install a strobe light visual alarm where indicated on drawings. The word "HELP" shall be stamped in red letters on the face of the Duress Alarm Warning Light.

## 2.9 ENCLOSURES (SEE SECTION 13830)

A. Install all components of control system in NEMA 1 enclosures with hinged doors(s), handle and key lock. All enclosures keyed alike.

B. Install engraved nameplate on each enclosure with system designation.

C. Provide door switch for alarm input to electronic control system.

## 2.10 WIRE AND CABLE

A. All Class 1 wiring shall be building wire of type specified in Division 16 work. Provide overcurrent protection for conductors in accordance with NEC. Minimum sizes as follows:

1. Indication: 18 GA minimum.

2. Control: 14 GA minimum.

B. All Class 2 wiring may be single conductor or multiple conductor cables. Conductors to be stranded type tinned copper, 22 GA minimum, PVC insulated.

C Wire for low voltage electro-mechanical locks shall be in sized to provide rated voltage at lock. Minimum wire size for 24VDC locks shall be as follows.

1. Less than or equal to 200 feet of wire from power supply to lock: 14 gauge.

2. More than 200 feet and less than or equal to 360 feet of wire from power supply to lock: 12 gauge.

3. More than 360 feet and less than or equal to 570 feet of wire from power supply to lock: 10 gauge.

D. Data cable for Ethernet connections shall be Category 5e/6. Limit cable lengths to 100 meters maximum.

1 Data Cable: Unshielded 4-Pair, shall exceed all requirements for ANSI/EIA/TIA-568-A-5 and support high speed communication network applications.
a. Category 5e:
1) Belden: 1594A — Dry, 7997A — Wet
2) West Penn: 4245 — Dry, M57561 — Wet
3) Comscope: 5EN5 — Dry, 5NF4 — Wet
b. Category 6:
1) Belden: 7881A — Dry, Wet not available
2) West Penn: 4246 — Dry, M57562 — Wet
3) Comscope: 75N4 — Dry, 6NF4+ — Wet

2.11 POWER SUPPLY

A. Provide power supplies as required for control and indication functions. Power supplies shall conform to requirements of NEC Article 725. Provide overcurrent protection of primary and distribute secondary overcurrent protection for secondary wiring circuits.

1. Class 1 power supplies shall be provided with overcurrent protection as required by NEC
Article 725. Provide overcurrent protection for all conductors in accordance with ampere rating. Minimum conductor size served by a Class 1 power supply shall be 18 GA.

2. Class 2 power supplies shall be power limited and/or overcurrent protected in accordance
with NEC Article 725. Nameplate rating of power supply shall not exceed limits indicated in NEC Article 725. Minimum conductor size served by a Class 2 power supply shall be 22 GA.

3. Size power supplies for nameplate ratings of each connected device or equipment.

4. Load on power supplies shall not exceed 90 percent of nameplate rating of power supply.

B. Power Source (120 VAC) for equipment shall be provided by Division 16. Provide terminals for all incoming circuits provided. Distribute load equally among all circuits provided.

C Where groups of doors are operated with a single action, divide doors into sub-groups of eight doors or less and provide time delay between each sub-group.

D. Power supplies for 24 VDC locks shall be provide in sufficient quantity for simultaneous

emergency release of all cell doors within at Housing Unit/Dayroom. Provide a minimum of one power supply for each 8 locks, using programmed timers to meet emergency release requirements as specified within specified loading requirements.

2.12 SPARE PARTS (SEE SECTION 28 00 00)

A. Deliver spare parts in protective wrapping and packaging for proper storage.

B. Provide the following spare parts.

1. Programmable Logic Controller:
   a. Input modules: one of each type used per location to meet spare points requirements.
   b. Output modules: one of each type used per location to meet spare points requirements.
   c. Ethernet network interface card: one of each type with transceivers
   d. Communications modules: one of each type used
   e. Software: one full backup.
   f. Processors: one of each type.

2 Networking devices:
   a. Managed Switches: One of each type used.
   b. Network Switches: One of each type used.
   c. Power Supplies: Two of each type used.

PART 3 - EXECUTION

3.1 INSTALLATION (SEE SECTION 28 00 00)

A. Provide direct supervision of installation of electronic control system at project site.

B. Clean area to receive electronic control system prior to installation.

C. Connect all field wiring to terminal blocks provided. Verify all labeling and coordinate with record documents.

3.2 TESTING (SEE SECTION 28

0000) 3.3 WIRING (SEE SECTION

28 000)

A Within consoles: point-to-point with appropriate terminal connections for every wire and component termination.

1. All connections mechanically secure.

2. All wiring and terminals clearly identified to facilitate connection of field wiring.

B. All cable and wire within console to be standard type available from multiple manufacturers.

C. All electrically operated locks and locking devices shall be grounded. Provide green ground conductor. Connect to ground conductor or ground lug at lock or lock device. If a conductor or lug is not provided with the lock or locking device, install a ground lug on the lock case and connect to ground.

D. Wiring shall be installed in strict accordance with NEC Article 725.

## 3.4 OWNER PERSONNEL TRAINING (SEE SECTION 28 00 00)

A. Provide training of owner personnel in proper operation and maintenance of electronic control systems.

B. Training Outline-Maintenance Staff

1. Systems Operation

2. Component Review

3. Routine Maintenance/Adjustments

4. Troubleshooting/Repair

5. Expansion Capabilities

6. Software Overview

END OF SECTION 28 40 00

**SECTION 28 51 23 - INTERCOMMUNICATION SYSTEM**

A. General: PART 1 – GENERAL

1.1 DESCRIPTION

1. Furnish all labor, materials, tools, equipment, and services for intercom system as indicated in accord with provisions of Contract Documents.
2. Completely coordinate with work of all other trades.
3. All security installation shall be coordinated with Fort Bend Facilities Electronic Lead
4. Security contractor to provide building intercom system for integrated intercom system with detention grade hardware, intercom, duress, etc.
5. Security contractor to provide local intercom system for standard door station, master station video with door release.
6. Security contractor to tie into existing Wanderware system. All Panic buttons, Intercom, Access control, Camera integration and control station integration shall be programed by MCS / Argyle only. Programming shall be part of this contract.
7. Contractor shall test and correct programming.
8. Although such work is not specifically indicated, furnish and install all supplementary or miscellaneous items, appurtenances and devices incidental to or necessary for a sound, secure and complete installation.
9. See Section 28 00 00 for Electronic Systems General Requirements.
10. See Division 1 for General Requirements.
11. All new and existing detention intercom stations must be tested, working and must give the control operator the ability to zoom to and view the camera which oversees the activated Intercom location.
12. Reference section 28 40 00 Electronic Control system
13. Reference Section 28 73 30 IP Security Camera System

B. Related work specified elsewhere:
1. Control Consoles, Cabinets and Enclosures: Existing equipment
2. Electronic Control System: Section 28 40 00
3. Touch Screen Control and Management System: Existing System
4. Video Surveillance Systems: Section 28 73 30

5. Category 6 Structured Cabling System 27 10 00

## 1.2 BASIS OF DESIGN

A. The purpose of the intercom systems is to provide two-way communications between a control station and an intercom station or speaker(s) for 3rd floor area "B". The communications shall be simplex in operation, occurring in one direction at a time. The direction of speech shall be controlled at the assigned control station with a Push-to-Talk function of the communications interface. Voice activated switches shall not be used.

B. Intercom systems

1. Intercom stations shall be provided in each cell or sleeping room and generally on each side of remotely controlled doors. Other locations may be required as shown on drawings.

2. Ceiling mounted speakers with wall mounted call-in pushbuttons may be used in some locations where sufficient wall space is not available for an intercom station.

3. Call-in pushbutton switches are used where call-in is desired, with no audio communications.

4. Intercom stations or pushbuttons in some locations shall be mounted in the door frame when there is a lack of sufficient space in adjacent walls. Coordinate with Detention Equipment Contractor for installation of devices in frames.

5. Intercom handsets may be used as indicated on drawings where private conversations are desired.

6. Each control station shall be provided with an intercom system. An intercom system shall include but not necessarily be limited to an amplifier, switching relays, microphone, panel speaker, push-to-talk, volume control, speakers, intercom stations, handsets, and call buttons.
   a. A communication interface will be provided at each control station to allow intercom and paging to occur.
   b. The amplifiers, switching relays and accessories shall be located in the designated equipment room. The switching relays shall be controlled by the Electronic Control System (ECS).

7. The project includes multiple intercom systems configured in a manner that will allow switching of system audio buses to a higher level control location when the local control station is disabled.
   a. An audio switching network shall be provided in order to allow transfer of the audio bus from the local intercom system to the intercom system at higher level control station.
   b. When a local control station is disabled by a duress alarm or higher level control station, the audio bus of the local intercom station shall be connected to the audio bus of the designated higher level control station. Upon disable of the local control

station, calls from devices in the local area shall be routed to the designated control station.

8 At control stations, cameras that are associated with intercom stations, acknowledgement of a call will cause the associated camera(s) to be displayed.

C. Paging systems

1. Paging is provided in corridors and designated areas in the building as indicated on the drawings. Ceiling mounted speakers are used in finished areas and paging horns are used in outdoor and recreation areas.

2. Paging is provided at the local housing unit for the purpose of general announcements to
occupants.
   a. Simultaneous paging of all the cells or sleeping rooms is available from the local control station via the intercom amplifier.
   b. Ceiling mounted paging speakers are provided in the housing units.

3. Paging of the housing unit is also provided from the higher level control rooms by transfer of audio bus from the local intercom system to the higher level intercom or paging systems. Paging from highest level control room shall take precedence.

4. The paging system is a zoned system with all-call options as listed in Schedule B at the end of this section

1.3 QUALITY ASSURANCE (SEE SECTION 28 00 00)

1.4 SUBMITTALS (SEE SECTION 28 00 00)

A. Intercom and Paging Systems.

1. Project data: Description of system operation indicating purpose and capabilities of each
component of system with functional system diagram indicating all interfaces to other systems. Description shall include, and call attention to, all variances from the contract documents.

2. Provide submittals for review to Security consultant and Fort Bend Facilities Electronic Lead.

3. Shop drawings: Complete installation drawings including system diagrams and terminal point to terminal point wiring diagrams or schedules.

4. Product data: Technical data sheets and specifications for each and every component.

5. Calculations: Amplifier sizing

6. Testing: Test reports of fiber optic cable installation.

1.5 WARRANTY (SEE DIVISION 1)

1.6 OPERATING AND MAINTENANCE DATA (SEE SECTION 28 00

00) PART 2 - PRODUCTS

2.1 GENERAL

A Manufacturers: All systems having authorized installer and service organization.

1. Amplifiers:
a. Base: Dukane, Rauland, TOA.

2. Audio switching accessories:
a. Base: Dukane, Rauland, Southern Steel Controls Division, Trentech, Inc., Stealth Technologies, Inc.

3. Speakers, backboxes and grilles:

4. Base: Atlas-Soundolier, Dukane, Rauland, Lowell.

5. Security intercom station:
a. Base: Atlas-Soundolier, Dukane, Rauland, Southern Steel Controls Division, Trentech, Inc., Stealth Technologies, Inc., Secure-Tech, Inc. Quam-Nichols Company.

6 Optional Systems: Optional systems are those which offer equal or greater functionality to that specified, however do so in a technically different manner than specified herein.
a. Harding Instruments Co. Ltd,. Microcomm DXL
b. Telecor T3

7. The product numbers contained herein are for reference only and may not be the most current available or a complete listing of all specification requirements, features or options required. Where a manufacturer is listed without a product number, a catalogued item was not evident. Should the listed manufacturer have an equivalent product, it may be submitted. Determination of equivalent is at the sole discretion of the Engineer. Where a conflict or ambiguity exists between the written description and the product number, the written description shall govern.

8 Other manufacturers desiring approval comply with Division 1.

2.2 INTERCOM SYSTEM

A. General

1. Provide two-way voice communications between each control station and its paging and intercom field devices. Each control station shall have a dedicated talk path to the intercom system of each control station to allow transfer of intercom functions to each higher level control station.

2. Provide all equipment for switching, annunciation, and amplification as required for described operation and functional diagrams.

3. Station selection to be initiated from Touch Screen Control Stations specified in Section 13833. Provide zone for each speaker and each intercom station indicated on drawings.

4. Intercom switching control shall be driven by the electronic control system specified in Section 13832. Intercom control shall be maintained physically separate from controls of other systems.

5. Multiple intercom systems shall be configured in a manner that will allow switching of audio buses to a higher level control station when the local control station is disabled.
   a. An audio switching network shall be provided in order to allow transfer of the audio bus from each local station intercom system to intercom system of each higher level control station.

   b. When a local control station is disabled by a duress alarm or touch screen station, the audio bus of the local intercom station shall be connected to the audio bus of the designated higher level control station. Upon disable of the local control station calls from devices in the local area shall be routed to the designated higher level control station.
   c. Provide power supplies as required.

6. Provide dry contact output, or data exchange interface on selected zones to video surveillance system for camera call-up.

7. House equipment in cabinets and/or enclosures as specified in Section 13830.

B. Operation:

1. Operation shall be in accordance with requirements for Touch Screen control.

2. Provide automatic transfer of intercom calls to higher level control when local touch screen is disabled.

C. Amplifiers:

1. Intercom amplifier.
   a. Provide amplifier for interface between touch screen device and speakers. Amplifier shall accept microphone, speaker, push-to-talk, and carbon handset intercom inputs from touch screens.
   b. Rated output: 25 V balanced, 16 watts RMS
   c. Adjustable monitor volume
   d. Provide auxiliary line level output to paging amplifier

e. Model:
1) Dukane 9A1875B http:/Avww.dukane.com/csd/Documents/Ispa/01-00154.pdf
2) Rauland DCC-12
3) STI

2. Power amplifiers: With silicon transistors exclusively with output at less than 5 percent distortion.
a. Frequency response 20 to 20,000 Hz plus/minus 2dB.
b. Noise level 75dB below rated output.
c. Input 400 microvolt - microphone, 0.3 volt auxiliary.
d. Balanced or single-ended 25 volt and 70 volt outputs at a screw terminal strip.
e. Output regulation within 2dB from no load to full load.
f. Auxiliary voltage of 28 volts DC, 50 ma maximum.
g. Unit rated 105-130 volt, 50-60 Hz.
h. Size amplifiers for load requirements.
i. Model:
1) Dukane 1A4060/125/250 http://www.dukane.comicsdkomm/1A4060.htm
2) TOA

3. Zone Page Controller for Telephone System input.

a. Provide controller with relay selection to accept input from telephone system distribute paging announcements to selected areas by individual zone or all zones.
b. Telephone system input: 600 ohm paging.
c. Zones: four plus all page.
d. Model:
1) VIKING Electronics

4 Do not load amplifiers more than 90% of rated capacity.

D. Audio selection panel:

1. Provide panel capable of switching audio circuits on to a common audio bus with input from switches on remote control panels.

2. Model:
a. Dukane 9A1825 http://www.dukane.com/csd/comm/specs/01-00433.pdf
b. Rauland TZ25/TZRM25
c. Southern Steel IC-400
d. Trentech
e. STI

E. Paging Horns - Surface Mount:

1. Provide horn of weatherproof construction.

2. Provide integral line transformer with power taps.

3. Frequency response 400-14,000 Hz.

4. Minimum Dispersion: 115 deg at 1000 Hz.

5. Power rating: 15 watts

6. Model:
   a. Atlas-Soundolier AP-15T
   b. Dukane 5A30 http://www.dukane.com/csd/Documents/Ispa/01-00377.pdf
   c. Rauland 3601

F. Paging Horns - Recess Mount:

1. Provide horn of weatherproof construction.

2. Provide integral line transformer with power taps.

3. Frequency response 475-14,000 Hz.

4. Minimum Dispersion: 180 deg

5. Power rating: 15 watts continuous

6. Model:

   a. Atlas-Soundolier APF-15
   b. Dukane
   c. Rauland 3607

G. Ceiling Speakers:

1. 8 IN, seamless cone type.

2. Frequency Response: 60 - 16,000 Hz minimum

3. Power rating: 15 watt normal, 25 watt peak.

4. Minimum Dispersion: 100 deg.

5. Sensitivity: 96 dB

6. Voice coil: 1 IN diameter.

7. Impedance: 8 OHM.

8. Transformer: Preassembled with speaker, multiple power taps.

9. Model:
   a. Atlas-Soundolier C5T72
   b. Dukane 5A607 http://www.dukane.comicsd/Documents/Ispa/01-00360.pdf
   c. Rauland US0215

H. Speaker and intercom enclosures:

1. Flush mount enclosures:
   a. Use in suspended ceilings.
   b. Non-secure areas:
      1) Atlas-Soundolier 198-8
      2) Dukane
      3) Rauland ACC1105
   c. Secure areas:
      1) Atlas-Soundolier 193-8
      2) Dukane
      3) Rauland ACC1108

2. Recess mount paging horn enclosure:
   a. Secure areas:
      1) Atlas Soundolier L20-201
      2) Rauland ACC 1111
      3) Dukane

3. Surface mount enclosures:
   a. Exterior finish: Baked white enamel.
   b. Non-secure areas
      1) Atlas-Soundolier SE161-R(6)
      2) Rauland ACC 1113
      3) Dukane
   c. Secure areas
      1) Atlas-Soundolier SE161-R(6)
      2) Rauland
      3) Dukane
   d. Intercom station security housing as detailed on drawings.
      1) Easter Owens

4. Grilles:
   a. Non-Secure areas:
      1) Atlas-Soundolier 161-8
      2) Rauland ACC 1003.
      3) Dukane 6A328
   b. Secure areas:
      1) Atlas-Soundolier VP 161-R8
      2) Rauland ACC 1008
      3) Dukane

5. Provide mounting hardware to secure speaker to grille and grille to back box.

6. Attach with security fasteners.

7. Provide weatherproof housing and pedestal for mounting intercoms in outside areas as indicated on drawings.

I Security intercom stations:

1. Speaker/microphone: Waterproof and puncture resistant mounted on 11 GA steel plate.

2. Faceplate shall secure to a standard electrical box. Where surface intercom stations are required, use cast box with smooth side and faceplate size to match box outside dimensions.

3. Speaker: 3" dynamic impregnated cone 2.5 oz ceramic magnet, 8 ohm voice coil with matching transformer.

4. Pushbutton switch: A single pole, single throw, momentary dry contact, moisture and damage proof.

5. Station with call in switch:
   a. Atlas-Soundolier VPCS-3PB with VP-65 special backbox
   b. Dukane 4A 1480 for mounting on standard 3 gang, 3.5" deep masonry backbox.
      1) http://www.dukane.comicsd/conispecs/0 1004 1 4.pdf
   c. Rauland HSS1 for mounting on standard 3 gang, 3.5" deep masonry backbox.
   d. Secure-Tech, Inc. TSS-2/1 1 for mounting on standard 2 gang, 3.5" deep masonry backbox. Coordinate rough-in requirements.
   e. Southern Steel Co.:
   f. Trentech:
   g. S T I :
   h. h. Quam: CIS2 (3 gang box) or CIS4 (2 gang box)

6 Remote call in switch:
   a. Atlas-Soundolier VPB-1
   b. Dukane 9A1895 http://www.dukane.comksdkorr/specs/01-00174.pdf
   c. Rauland HS S3
   d. Southern Steel Co.:
   e. Trentech:
   f. S T I :

7 Where devices are to be surface mounted, provide cast box with smooth sides.

8 Communications interface. See Section 13833
   a. Provide interface console at each touch screen control station to provide voice communications to remote audio devices. Console shall be constructed of stainless steel for desktop mounting Include the following devices and connectors.
      1) Gooseneck microphone for intercom and paging speech.
      2) Speaker for intercom listening
      3) Push-to talk switch for intercom connect
      4) Volume control for incoming speech
      5) Connector jack for foot switch, providing intercom connect in parallel with push-to-talk switch
      6) Connector for headset communication. Connection of headset shall disable console speaker and microphone
      7) Provide a headset with speakers, microphone, and coil cord (6 ft. minimum for communications. The push-to-talk buttons on the communications panel, and

the foot switch shall remain operational for communication When the headset is connected. Headset shall be type to cover one ear and be of high quality, durable construction.

b. Foot switches shall be Linemaster Switch Corporation 632 Clipper Series with SPDT momentary contact. (800-974-3668)

J. Ceiling mounted speaker shall be as specified above.

## 2.3 LOCAL INTERCOM SYSTEM (AIPHONE) (MS & DS)

A. Provide local intercom system for two way communications between multiple stations.

1. Provide the local intercom system at following locations:
   **a.** From door to Staff Stations

2. Visitor call stations shall be provided with following features:
   a. Direct Selection:
      1) Press call button for judge's chambers you want to call.
      2)You will hear muted-volume call tone at visitor station.

3. A. Responding to Call:
   a. When call is from visitor station, call tone will ring at staff station for approximately 10 seconds.
   b. On staff station, press talk button within set time to respond and talk hands free.
   c. If you press and hold talk button for 1 second before speaking, beep will be emitted and you can communicate by press-to-talk communication.
   d. In press-to-talk communication, press talk button to talk and release it to listen.
   e. When you are done talking, press and hold down talk button.
   f. Communication will be ended automatically after approximately 1 minute when hands free communication is used at staff station or after approximately 3 minutes when handset is used.

4. Wiring between stations shall be per manufacturer's recommendation.

5. Provide power supply in NEMA 1 enclosure for service from 120 volt source. Install in accessible location above ceiling.

6. Models:
   a. Master Station — Aiphone GH-1AD series
   b. Door Station — Aiphone GH-SW series

## 2.6 POWER SUPPLY

A. Provide power supplies as required for audio equipment and functions. Power supplies shall conform to requirements of NEC Article 725. Provide overcurrent protection of primary and distribute secondary overcurrent protection for secondary wiring circuits.

1. Class 1 power supplies shall be provided with overcurrent protection as required by NEC Article 725. Provide overcurrent protection for all conductors in accordance with ampere rating. Minimum conductor size served by a Class 1 power supply shall be 18 GA.

2. Class 2 power supplies shall be power limited and/or overcurrent protected in accordance with NEC Article 725. Nameplate rating of power supply shall not exceed limits indicated in NEC Article 725. Minimum conductor size served by a Class 2 power supply shall be 22 GA.

3. Load on power supplies shall not exceed 90 percent of nameplate rating of power supply.

B. Power Source (120 VAC) for equipment shall be provided by Division 16. Provide terminals for all incoming circuits provided.

## 2.7 WIRE AND CABLE

A. Provide wire and cable for operation described. Provide separate cable for each intercom station.

1. Intercom with call-in: Minimum 22 GA one shielded pair and a pair,
   a. Manufacturer (dry application):
      1) Belden 8724
      2) West Penn 357
      3) Comm/Scope, Inc.6600
      4) Liberty 22-2P-INDSH-GRY b. Manufacturer
   (wet application):
      1) Belden 5502G1
      2) West Penn AQC357
      3) Comm/Scope, Inc.
      4) Liberty

2. Call-in only: Minimum 22 GA one pair
   a. Manufacturer (dry application):
      1) Belden 8442
      2) West Penn 221
      3) Comm/Scope, Inc. S222USTR
      4) Liberty 22-2C-SH-GRY
   b. Manufacturer (wet application):
      1) Belden 5500F1
      2) West Penn ACQ224
      3) Comm/Scope, Inc.
      4) Liberty

3. Page only: Minimum 22 GA one shielded pair,
   a. Manufacturer (dry application):

1) Belden 9462
2) West Penn 291
3) Comm/Scope, Inc.S222SSTR
4) Liberty 22-2C-SH-GRY

b. Manufacturer (wet application):
1) Belden 5501G1
2) West Penn AQC291
3) Comm/Scope, Inc.
4) Liberty

2.8 SPARE PARTS (SEE SECTION 28 00 00)

A. Deliver spare parts in protective wrapping and packaging for proper storage.

B. Provide the following spare parts:

1. Speakers: four (4) of each type used.

2. Grilles: four (4) of each type used.

3. Security Intercom stations: four (4) for each type used

4. Audio switching boards: two (2) of each type.

5. Power Supply: Two (2) of each type/size

6 Amplifiers:
a. Intercom amplifiers: one (1)
b. Power amplifiers: one (1) of each size

7. Communications interface components: one (1) of each component

8. Foot switch: one (1)

9. Headset: four (4) total

PART 3 - EXECUTION

3.1 INSTALLATION (SEE SECTION 28 00 00)

A. Microphone, line and speaker levels shall be run in separate raceways and shall be separated from one another and from power cabling in racks and on terminal boards.

B. Comply with the manufacturer's recommendations, procedures and standards for the setup and adjustment of the systems installed.

1 Make all intercom speaker tap and amplifier gain adjustments prior to performance testing as follows:
   a. Intercom Speaker Tap Adjustments: Select intercom taps for 75 dBA at 4 feet on-axis with power input equal to tap setting (e.g, at 1/2-watt input).
   b. System Amplifier Gain Adjustments: Adjust intercom amplifier gain controls in both the monitor and talk direction to provide unity gain (to produce the same level in the control room as the person talking at the intercom station and vice versa) with speaker volume controls at mid-range.
   c. Once set, mark or identify all adjustment settings on the amplifiers and accessories.

3.2 WIRING (SEE SECTION 28 00 00)

3.3 TESTING (SEE SECTION 28 00 00)

3.4 OWNER PERSONNEL TRAINING (SEE SECTION 28 00 00)

A. Provide training of owner personnel in proper operation and maintenance of intercom systems.

B. Training Outline-Operational staff

1. Functions performed

2. Acknowledgment/Responses

3. Control Functions

4. Emergency Staff Communications

C. Training Outline-Maintenance Staff

1. Systems Operation

2. Component Review

3. Routine Maintenance/Adjustments

4. Troubleshooting/Repair

5. Expansion Capabilities

**END OF SECTION**

**SECTION 28 73 30 – IP SECURITY CAMERA SYSTEM**

CONDITIONS OF THE CONTRACT AND DIVISION 1, as applicable, apply to this Section.

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Provide a complete turnkey and tested IP based digital video surveillance system including but not limited to cameras, cabling, integration and accessibility with Owner's Local/Wide Area Network (LAN/WAN), Internet accessibility thru remote view application software, simultaneous user access capability and all applicable licensing. Provide fully terminated unshielded twisted pair (UTP) cable, UTP terminations, racks, raceways, conduit, and other incidental and miscellaneous premises wiring system hardware as required for a complete and useable system. The installation shall comply with applicable codes and standards in effect at the job site and as indicated in the Specifications and Drawings.

B. Integration and programming with Access Cotrol, Electronic Control System shall be performed by MCS.

C. All new cameras shall be updated to the latest firmware revision.

D. All new and existing cameras must be verified recording, all user functions operable, time synchronized, viewable in Pelco Utilities application, WS5000 (Work Station) application, and all existing user control stations.

E. All new and existing detention intercom stations must be tested, working and must give the control operator the ability to zoom to and view the camera which oversees the activated Intercom location.

F. The system shall be Non-Proprietary in nature and be available through multiple distribution channels in the nearest metropolitan marketplace. Systems that are manufactured and installed by a factory office and are not available through multiple distribution channels will not be accepted.

G. Provide all electronic hardware and coordinate with the building's LAN/WAN. The contractor shall coordinate with other system vendors, where appropriate, to facilitate equipment installation, scheduling, protection of equipment and access to the project site in order to provide the Owner a substantially complete project in a timely manner.

H. Acceptable manufacturer's of IP recording software shall be Pelco Endura. The IP security camera system contractor shall be responsible for the configuration of servers and software and shall provide storage calculations to the district for review with the submittal package. All servers will be purchased by the owner and contractor configured and installed.

F. The Contractor performing this scope of work must be a current integrator of solution Pelco, and be able to include information on current support staff to be able to service this client as needed 24x7 for emergency support.

G. Contractor is responsible for coordinating all electrical work required on this project for connection of a cameras, conduit, and power supplies. Contractor shall provide a complete turnkey solution to the owner and be responsible for the complete installation of a complete and functional security camera system.

H. All work shall be coordinated through Fort Bend Facilities Electronic Lead.

I. Maintain existing security camera systems in a manner in which they can provide continuous coverage and protection of FBJC property during construction.

J. It will be the responsibility of the General Contractor to ensure that the security CCTV System and its components are installed and working at completion of the project. This includes but not limited to the repair/replacement of any component removed or damaged during construction.

K. All systems SHALL be installed in accordance with ALL local, city, state, federal and Authority Having Jurisdiction laws, regulations, codes, standards and ordinances and approved by the FBJC Facilities Improvement Project Manager.

L. All Pelco camera installers shall be certified in the installation of Pelco IP cameras.

M. All security installation shall be coordinated with Fort Bend Facilities Electronic Lead.

N. The contractor must have a minimum of one (1) year experience in installing Pelco Endura.

O. All IP security camera servers and storage are existing. Provide Cameras and programming.

P. All bidders must provide a minimum of 3 multi-site installations preferably in Fort Bend Facilities Electronic Lead in the past one (1) year.

Q. All contractors installing I.P. cameras to the I.P. Software must certify in writing a three hour turn around on trouble calls, if I.P. Pelco Software is down.

R. Contractor must have experience/knowledge of Pelco Endura, client and viewer Software.

S. Contractor shall test and correct programming.

T. Security contractor to tie into existing Wanderware system. All Panic buttons, Intercom, Access control, Camera integration and control station integration shall be programed by MCS / Argyle only. Programming shall be part of this contract.

U. Type of I.P Software for I.P. cameras to be installed on all I.P. camera projects will be, Pelco Software Platforms.

V. All equipment shall be UL Listed and approved for the purpose it is being used.

W. All vendors/contractors/sub-contractors working on CCTV system will submit to Fort Bend Facilities Electronic Lead and FBJC Facility Improvement Project Manager a complete set of plans for approval prior to the beginning of any project. Plans must include, but not limited to, complete equipment list, wiring diagram and POE locations. A Pre-Installation meeting will be held between all parties in order to review submittals and coordinate installation. Additional meetings will be held as needed.

X. All new CCTV I.P. camera installations and upgrades will be a turnkey operation - this includes but is not limited to: purchasing, programming and licensing of all software, equipment, focusing of cameras, naming of cameras, administrative views and mapping of the campus within the software.

Y. The types of cameras to be installed will be coordinated prior to installation and labeled on shop drawings; Shop drawings must be approved prior to the installation of any equipment for rough in, this will also include all power supply locations where applicable.

Z. Contractor shall provide a backup UPS as per requirements for the POE switches, and IP Servers.

AA. Related work

a. Electronic Control system 28 40 00

b. Intercom and Paging Systems: Section 28 51 23.

c. Touch Screen Control and Management System: Existing Equipment.

## 1.2 QUALITY ASSURANCE

A. Installer Qualifications:

1. The Video Surveillance System Installer shall be licensed and shall meet all applicable regulations. The Contractor shall be a firm normally employed in the security and surveillance industry.
2. The contractor shall be certified by Pelco Endura in all aspects of design, installation and testing of the products described herein. Each contractor shall furnish with their submittal a letter from the manufacture indicating they are a dealer in good standing.
3. The contractor must be certified by the manufacturer of the products, adhere to the engineering, installation and testing procedures and utilize the authorized manufacturer components and distribution channels.
4. The contractor shall be experienced in all aspects of this work and shall be required to demonstrate direct experience on recent systems of similar type and size. The contractor shall own and maintain tools and equipment necessary for successful installation and testing of video surveillance distribution systems and have personnel who are adequately trained in the use of such tools and equipment.
5. A resume of qualifications shall be submitted with the Contractor’s proposal indicating the following:
    a. A list of five recently completed projects using the product proposed of similar type and size with contact names and telephone numbers for each.
    b. A list of test equipment proposed for use in verifying the installed integrity of metallic cable systems on this project.
    c. A technical resume of experience for the contractor’s Project Manager and on-site installation supervisor who shall be assigned to this project.
    d. A list of technical product training attended by the contractor’s personnel that shall install the video surveillance system shall be submitted.
    e. Any subcontractor who shall assist the video surveillance contractor in performance of this work shall have the same training and certification as the video surveillance contractor.
    f. A Certification from Pelco, with class completion dates Endura.

B. The Owner's representative reserves the right to reject all or a portion of the work performed, either on technical or aesthetic grounds.

C. The following is a list of contractors that are approved, meet specifications and have successfully done work for *FBJC.* Facilities Electronic lead, Names, Addresses and other information is correct at the time this document was created and subject to changes and revisions:

Any other contractor that meets all other requirements in the specifications must be pre-approved by Fort-Bend County Facilities Electronic lead no less than 10 days prior to Bid to be considered for the project.

1.3 REGULATORY REQUIREMENTS

A. Standards: All work shall be performed in accordance with the latest revisions of the following standards and codes:
1. Local Building Code
2. Local Electrical Code
3. NEC National Electrical Code

B. Other references:
1. TIA/EIA-568-A - Commercial Building Telecommunications Wiring Standard
2. EIA/TIA-569 - Commercial Building Standard for Telecommunications Pathways and Spaces.
3. TIA/EIA-606 - The Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
4. TIA/EIA-607 - Commercial Building Grounding and Bonding Requirements for Telecommunications
5. TIA/EIA TSB 67 - Transmission Performance Specification for Field Testing of Unshielded Twisted-Pair Cabling Systems.
6. ISO/IEC 11801 - Generic Cabling Standard
7. EN 50173 - Generic Cabling Standards for Customer Premises

C. Governing Codes and Conflicts: If the requirements of these specifications or the Project Drawings exceed those of the governing codes, regulations, and manufacturer installation requirements, then the requirements of these specifications and the drawings shall govern. However, nothing in the drawings or specifications shall be construed to permit work not conforming to all governing codes, regulations, and manufacturer installation requirements.

1.4 SUBMITTALS

A. The video surveillance system installer shall furnish all CCTV system submittals in a single consolidated submittal

B. Shop Drawings: Submit the following items, for Owner review and approval:
1. Samples: Complete manufacturer's product literature and samples (if requested) for all pre-approved substitutions to the recommended products made during the course of the Project.
2. Permits: The Contractor shall obtain all required permits and provide copies to the Owner/Architect/Engineer

3. Product Literature: Complete manufacturer's product literature for all electronics, cable, cable supports, cable labels, outlet devices, and other products to be used in the installation. In addition, whenever substitutions for recommended products are made, samples (when requested by the Owner/Architect/Engineer) and the manufacturer's supporting documentation demonstrating compatibility with other related products shall be included.
4. Testing: Proposed Contractor test result forms, a list of instrumentation to be used for systems testing.
5. A complete point-to-point floor plan diagram indicating camera locations part numbers, lens selections, NVR locations and all required cabling to connect systems shall be provided for review prior to installation. No work shall start until drawings have been reviewed and approved.

C. All subcontractors shall provide submittals to general contractor for normal distribution to Architects, Engineers and Fort-Bend County Facilities Electronic project managers. The general contractor shall also distribute to The FBJC Facilities Electronic lead department.

D. Project Completion: As a condition for project acceptance, the Contractor shall submit the following for review and approval:
1. Inspection and Test Reports: During the course of the Project, the Contractor shall maintain an adequate inspection system to ensure that the materials supplied and the work performed, conform to contract requirements. The Contractor shall provide written documentation that indicates that materials acceptance testing was conducted as specified. The Contractor shall also provide documentation, which indicates that all cable termination testing was completed and that all irregularities were corrected prior to job completion.
2. Operating and Maintenance Instructions for all devices within the system. These instructions shall reflect any changes made during the course of construction, and shall be provided to the Owner, for their use, in a three-ring binder labeled with the project name and description. (4 copies)
3. All training sessions with district staff and training media shall be complete.
4. As-built Drawings shall include cable pathways, camera locations with correct labeling and MDF/IDF locations. The as-built drawings shall be prepared using AutoCad. Provide the Owner with electronic versions of the as-builts on CDs.

PART 2 -PRODUCTS

2.0 NETWORK STORAGE MANAGER EXISTING

A. Pelco Model Numbers

| | | |
|---|---|---|
| 1. | NSM5200-12 | Network storage manager, 12 TB storage |
| 2. | NSM5200-24 | Network storage manager, 24 TB storage |
| 3. | NSM5200-36 | Network storage manager, 36 TB storage |

2.1 ENVIRONMENTAL NETWORK DOME CAMERA (Court room and Elevator)

A. The environmental network dome camera shall offer multiple simultaneous video streams with standard definition 800 x 600 resolution, auto iris and varifocal lens.

B. The environmental network dome camera shall provide a manual 3-axis (pan/tilt/rotation) positioning to allow adjustment for optimum camera rotation and placement.

C. The environmental network dome camera shall provide a discreet liner integrated to the camera module.

D. The environmental network dome camera shall have a temperature compensated auto back focus.

E. The environmental network dome camera shall feature an unsupervised alarm input, relay output and line level/external microphone input connections.

F. The environmental network dome camera shall provide a removable, local storage medium (Micro SD) to capture video clips of varying lengths upon camera sabotage, motion, or relay alarm. Video can be retrieved from the card through the FTP protocol.

G. The environmental network dome camera shall provide a service video stream in addition to and independent of the video streams.

H. The environmental network dome camera shall provide advanced low-light capabilities for day/night models with sensitivity down to 0.01 lux in night mode.

I. The environmental network dome camera shall support industry standard Power over Ethernet (PoE) IEEE 802.3af, Class 3 to supply power to the camera over the network.

J. The environmental network dome camera shall have a mechanical IR cut filter mechanism for increased sensitivity in low-light installations. Set points for the IR cut filter feature shall be configurable through an embedded Web browser.

K. The environmental network dome camera shall support H.264 High or Main profiles, or MJPEG using constant bit rate (CBR), and constrained variable bit rate (CVBR) with configurable maximum value.

L. The environmental network dome camera shall support two simultaneous, configurable video streams. H.264 and MJPEG compression formats shall be available for primary and secondary streams with selectable Unicast and Multicast protocols.

M. The environmental network dome camera shall support configurable frame rates, bit rates and group of pictures (GOP) structures for additional bandwidth administration.

N. The environmental network dome camera shall be conformant to the ONVIF Profile S and Profile G supporting open architecture best practices with a published API available to third-party network video recording and management systems.

O. The environmental network dome camera shall support 4 window blanks to conceal user-defined privacy areas that cannot be viewed by an operator.

P. The environmental network dome camera shall offer local storage capture of 10-second video clips on camera from alarms created by sabotage, motion detection, or alarm inputs.

Q. The environmental network dome camera shall offer the ability to record continuous video in the case of network outage, where the camera is powered by 24 VAC. It will be accessible through FTP protocol.

R. The environmental network dome camera shall provide the ability to backup and restore camera settings through an embedded Web browser.

S. The environmental network dome camera shall provide 802.1x port security to establish point-to-point access through a wired or wireless port using Extensible Authentication Protocol (EAP). Supported EAP methods shall include EAP-MD5, EAP-TLS, EAP-TTLS, EAP-PEAP.

T. The environmental network dome camera shall support SNMP v2c and v3.

U. The environmental network dome camera shall provide flicker correction with selections for 50 Hz or 60 Hz line frequency.

V. The environmental network dome camera shall provide motorized zoom capabilities with a Web browser interface for remote configuration and administration.

W. The environmental network dome camera shall provide autofocus capabilities with a Web browser interface for remote configuration and administration. The automatic autofocus shall be triggered when the camera detects an environmental temperature change and when the camera changes from color to monochrome or vice versa. User-selectable options for full-range auto-focus and quick auto-focus shall be available.

X. The environmental network dome camera shall provide user-selectable configurations for day/night auto mode. Transitional levels shall be used to set the desired light level for transitioning to night mode. Transition detect time shall control the length of time that the camera is exposed to a light level before changing to color or monochrome mode.

Y. The environmental network dome camera shall provide User and Group settings to assign permissions and access levels to the camera. The camera shall provide local management where the camera manages the access levels or remote mode where the camera authenticates the user through a Lightweight Directory Access Protocol (LDAP) server.

Z. The environmental network dome camera shall provide simple motion detection to detect motion within a user-defined field of view or within a user specified rectangular zone. Such behaviors shall trigger an alarm.

AA. The environmental network dome camera shall provide camera sabotage analytics to detect changes in the camera's field of view, including obstruction of the lens and unauthorized movement of the camera. Such behaviors shall trigger an alarm.

BB. The environmental network dome camera shall be plenum-rated per 2008 NEC article 300.22(C)(2).

CC. The environmental network dome camera shall be IP66 rated.

DD. The environmental network dome camera shall provide a 3/4-inch NPT conduit attachment on the back box for in-ceiling mounted applications.

EE. The environmental network dome camera shall provide a 1.5-inch NPT conduit attachment for pendant mounted applications.

FF. The environmental network dome camera shall attach to a standard double-gang electrical box for surface mounted applications.

GG. The environmental network dome camera shall be capable of firmware upgrades through a network using a web user interface or a software-based device utility.

HH. The environmental network dome camera shall meet or exceed the following design and performance specifications.

.

1. Camera Specifications

| | |
|---|---|
| a. Imaging Device | 1/4-inch |
| b. Imager Type | CMOS |
| c. Imager Readout | Progressive scan |
| d. Maximum Resolution | 0.5 MPx (800 x 600) |
| e. Electronic Shutter Range | 1/5 ~ 1/2,000 sec |
| f. Electronic Wide Dynamic Range | Up to 65 dB |
| g. White Balance Range | 2,500° to 8,000°K |
| h. Noise Reduction | YES (ON/OFF selectable) |
| i. Signal to Noise Ratio | 50 dB |
| j. Sensitivity | Down to 0.01 lux – mono mode, 200ms, f/1.4 |
| k. Mechanical IR Cut Filter | Yes, (AUTO/MANUAL selectable), with different set points on lux |
| l. Available Languages | Chinese, English, French, German, Italian, Portuguese, Russian, Spanish, and Turkish |

2. Lens Specifications

| | |
|---|---|
| a. Lens Type | Built-in; varifocal |
| b. Focal Length | 2.8 ~ 10 mm |
| c. Focus | Autofocus, motorized |
| d. Zoom | Remote |
| e. Auto Iris Type | DC drive lens |

3. Video Specifications

| | |
|---|---|
| a. Video Streams | Multiple simultaneous streams with up to 2 different configurations plus service stream; the second stream is variable based on the setup of the primary stream |
| b. Text Overlay | Camera name, time, date, and customizable text with multiple supported languages |
| c. Available Resolutions | Two configurable streams as follows: |
| 1. 0.5 Megapixel | 800 x 600; 4:3 aspect ratio |
| 2. 0.3 Megapixel | 640 x 480; 4:3 aspect ratio |
| 3. 0.1 Megapixel | 320 x 240; 4:3 aspect ratio |
| 4. 0.1 Megapixel | 320 x 180; 16:9 aspect ratio |
| d. Frame Rate | Up to 30, 20, 25, 16.67, 15, 12.5, 10, 5, 1 (depending on the coding, resolution, and stream configuration) |
| e. Video Encoding | H.264 High or Main profiles and MJPEG |

f. Bit Rate Control — Constant bit rate (CBR), constrained variable bit rate (CVBR) with configurable maximum value
g. Service Stream — 640 x 480 or 640 x 352; 2 ips, JPEG
h. Window Blanking — 4 configurable windows
i. Supported Protocols — TCP/IP, UDP (Unicast, Multicast IGMP), ICMP, IPv4, SNMP v2c/v3, HTTP, HTTPS, SSL, SSH, SMTP, FTP, RTSP, UPnP, DNS, NTP, RTP, RTCP, LDAP (client), QoS
j. Users
   1. Unicast — Up to 4 simultaneous users and 1 administrator
   2. Multicast — Unlimited H.264
k. Security Access — Multiple user access levels with password protection
l. Mobile Application — Integrated with Pelco Mobile Application
m. Analytics — Simple motion detection and camera sabotage detection
n. Local Storage — Capture 1-, 5-, or 10-second video clips on camera sabotage, motion detection, or alarm input; record video continuously in the case of network outage with option to overwrite; access video through FTP protocol and ONVIF Profile G
o. Camera Discovery and Firmware — Cameras discovered and firmware upgraded through the Pelco Device Utility 2 version 2.2 (or later); cameras discovered and firmware upgrade through Endura Utilities

4. Electrical Specifications
   a. Network Port — RJ-45 for 100Base-TX
   b. Cable Type — Cat5e cable or better for 100Base-TX
   c. Input Power — PoE (IEEE 802.3af) Class 3; 24 VAC nominal, 18 to 32 VAC range
   d. Power Consumption — < 8 W nominal
   a. Local Storage — Up to 32 GB on Micro SDHC or SDXC card
   b. Alarm
      1. Input — 1
      2. Output — 1; PhotoMOS™ relay (30 V, 1 A)
      3. Triggers — Unsupervised mode that detects switch closures (N.O. and N.C.)
   c. Audio
      1. Streaming — Dual-channel
      2. Input/Output — Line-in/terminal block
      3. Compression — G.711 A-law / G.711 U-law

2. Analytic Specifications
   a. Required Systems for Pelco Analytics
      1. Pelco Interface — Endura 2.x workstation software or later Digital Sentry version 7.3 or later
      2. Open API — The Pelco API can transmit behavior alarm data to third-party applications

3. Mechanical Specifications
   a. Clear Dome Attenuation — Zero light loss
   b. Construction — IP66 ingress protection; IK10 (20J) impact resistance
   c. Pan/Tilt Adjustment — Manual
      1. Pan — 355°
      2. Tilt — 75°
      3. Rotation — 360°

4. Environmental Specifications
   a. Operating Temperature — –40º to 50ºC (–40º to 122ºF)
   b. Operating Humidity — 15 to 85%, RH condensing

5. Certifications
   a. CE, EN 55022 (Class A), EN 50130-4, EN 60950-1
   b. FCC (Class A) – 47 CFR Part 15
   c. UL/cUL Listed, UL60950-1
   d. CAN/CSA-C22.2 No. 60950-1-07
   e. ICES-003
   f. KCC
   g. ONVIF Profile S and Profile G conformant

B. Pelco Model Numbers
   1. Pelco IMES19-1ES Environmental vandal resistant surface mount POE MDome STD camera
   2. Pelco IMES19-1I Indoor In-ceiling POE MDome STD camera

## PART 3 - EXECUTION

### 3.1 INSTALLATION

A. Cable Pathway:
   1. In suspended ceiling and raised floor areas where duct, cable trays or conduit are not available, the Contractor shall bundle, in bundles of 25 cables or less, with cable ties snug, but not deforming the cable geometry. Cable bundles shall be supported via “J” hooks attached to the existing building structure and framework at a maximum of five (5) foot intervals. Plenum rated cable ties shall be used in all appropriate areas. The Contractor shall adhere to the manufacturer’s requirements for bending radius and pulling tension of all cables.
   2. Cables shall not be attached to lift out ceiling grid supports or laid directly on the ceiling grid.
   3. Cables shall not be attached to or supported by fire sprinkler heads or delivery systems or any environmental sensor located in the ceiling air space.

B. Fire Wall Penetrations: The Contractor shall avoid penetration of fire rated walls and floors wherever possible. Contractor shall also seal all floor, ceiling and wall penetrations in fire or smoke barriers and in the wiring closet.

C. Wall Penetrations: Where penetrations are necessary, they shall be sleeved with metallic conduit and resealed with an Underwriter Laboratories (UL) approved sealant.

D. Provide three sided pre-finished metal hood and seal to wall where conduit penetrates exterior wall.

E. For any required conduit, Install new portable pipe supports – (low profile type), as manufactured by Portable Pipe Hangers or Advanced Support Products. Provide roof protection pads under each support. Coordinate location and routing with design engineer prior to rough-in or installation of system.

F. Do not install wall mounted camera's into metal fascia. Ensure they are mounted into brick, and sealed top and sides (not bottom)

3.2 DOCUMENTATION

A. Labels: The Contractor shall label all Cameras using permanent machine engraved labels approved by the Owner. Label patch panels in the wiring closet to match those on corresponding camera locations. The font shall be at least one-eighth inch (1/8") in height, block. All labels shall correspond to as-builts and to final test reports.

B. Contractor shall ensure complete typed labeling of all cameras with numbers that correspond to locations on video server. Labeling system shall correspond to the Owner's labeling system. Verify with Owner. Provide tags (black letters on white labels, plastic coated) on all cables and outlets.

C. All cables shall be labeled at both ends with a machine label and all terminations shall be stenciled with a typed label for quick circuit identification. Labeling shall conform to TIA/EIA standard 606 and include interconnect cable identification numbers.

D. A floor plan, clearly labeled with all numbered camera locations, shall be included in the as-built plans.

E. At time of acceptance from contractor to owner, contractor will provide a set of as-builts to owner with all pertinent information on the.

F. The contractor shall provide metallic name plates for each camera that correspond to as built drawings.

G. The contractor shall provide (2) laminated spreadsheets that contain all installation data for the IP camera system. The spreadsheet must contain the following data.

1. Camera Number
2. Device ID
3. Device Type
4. Model Number
5. Device Location
6. MDF/IDF Location
7. Patch Panel Port
8. Switch Port
9. DLK
10. Mac Address

11. IP Address
12. Subnet
13. Gateway
14. User/Pass
15. Firmware Version
16. Video Encoding Stream Type.

3.3 CABLE TESTING - BY MANUFACTURER'S REQUIREMENTS

A. Notification: The Owner/Architect/Engineer shall be notified one week prior to any testing so that the testing may be witnessed.

B. Final Acceptance: Before requesting a final acceptance, the Contractor shall perform a series of end-to-end installation performance tests. The Contractor shall submit for approval a proposal describing the test procedures, test result forms and time table for all copper and fiber optic cabling.

C. Procedures: Trained personnel shall perform all testing. Acceptance of the test procedures discussed below is predicated on the Contractor's use of the recommended products and adherence to the inspection requirements and practices set forth. Acceptance of the completed installation shall be evaluated in the context of each of these factors.

E. Errors: When errors are found, the source of each error shall be determined, corrected and the cable retested. All defective components shall be replaced and retested. Retest results must be entered on the test results form. All corrections shall be made prior to final acceptance test.

3.4 INSPECTION

A. Conformance to the installation practices covered above are to be verified when completed. In some cases, the Owner/Architect/Engineer may observe before acceptance.

B. The contractor shall provide a sign in sheet and All training must be video taped by the contractor. The contractor shall provide taped training video on (2) DVD discs and sign in sheet to the Spring Brach Technology Department prior to close out. As well as include (2) additional discs for the O&M manuals

3.5 WARRANTY

A Guarantee and warrant all equipment provided for a period of 3 years following date of substantial completion, or a period equal to the stated guaranty/warranty offered by the product manufacturer, whichever is the longest in duration.

B. All such warranties shall include all parts (NVR's, and Power Supplies).

C. Labor and all other costs as necessary to maintain the equipment in operating condition as intended by the product manufacturer after a period of 1 year shall be negotiated with the owner upon project completion.

**END OF SECTION**

# FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

# 1422 EUGENE HEIMANN CIRCLE RICHMOND, TX 77469

**Project State Registration #:**

ARCHITECT

**PGAL, INC.**
3131 BRIARPARK DR.
SUITE 200
HOUSTON, TX 77042
T) 713-622-1444

OWNER

**FORT BEND COUNTY**
301 JACKSON ST.
RICHMOND, TX 77469

T) 281-342-3411

MEP, TELECOM, AUDIO VISUAL, SECURITY

**DBR ENGINEERING CONSULTANTS, INC.**
9990 RICHMOND AVENUE
SOUTH BUILDING, SUITE 300
HOUSTON TX, 77042
T) 713-914-0888

**10/17/2024**

**ISSUE FOR PERMIT & BID**

K.P. GEORGE
*COUNTY JUDGE*

VINCENT MORALES
*COMMISSIONER, PRECINCT 1*

GRADY PRESTAGE
*COMMISSIONER, PRECINCT 2*

ANDY MEYER
*COMMISSIONER, PRECINCT 3*

DEXTER L. MCCOY
*COMMISSIONER, PRECINCT 4*

**FILE NAME:** C:\@Revit\Locale\Fort Bend County Justice Center\FBC_ARCH_R23.rvt
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PGAL

ARCHITECTURE
ENGINEERING
INTERIORS
PLANNING

**ALEXANDRIA**
**ATLANTA**
**AUSTIN**
**BOCA RATON**
**DALLAS**
**DENVER**
**HOBOKEN**
**HOUSTON**
**LAS VEGAS**
**LOS ANGELES**
**SALT LAKE CITY**
**SAN DIEGO**

**REGISTRATION**
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REGISTERED ARCHITECT 16372 STATE OF TEXAS
10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NUMBER**
1007828.00

**SHEET TITLE**
COVER SHEET

**SHEET NUMBER**
G0.00

| Sheet № | Sheet Name |
|---|---|
| **GENERAL** | |
| G0.00 | COVER SHEET |
| G0.01 | SHEET INDEX |
| G0.02 | GENERAL PROJECT INFORMATION |
| G0.10 | LIFE SAFETY CODE ANALYSIS |
| G0.11 | ADA STANDARDS |
| G0.12 | ADA STANDARDS |
| **DEMOLITION** | |
| D2.11 | LEVEL 1 PARTIAL DEMOLITION FLOOR PLAN A |
| D2.12 | LEVEL 1 PARTIAL DEMOLITION FLOOR PLAN B |
| D3.11 | LEVEL 1 PARTIAL DEMOLITION REFLECTED CEILING PLAN A |
| D3.12 | LEVEL 1 PARTIAL DEMOLITION REFLECTED CEILING PLAN B |
| **ARCHITECTURAL** | |
| A0.10 | PARTITION TYPES |
| A0.20 | FINISH MATERIAL LEGEND & SCHEDULE |
| A0.30 | DOOR TYPES & SCHEDULE |
| A0.31 | DOOR DETAILS |
| A0.40 | WINDOW TYPES & DETAILS |
| A0.50 | SIGNAGE TYPES |
| A0.55 | LEVEL 1 SIGNAGE PLAN |
| A2.10 | LEVEL 1 OVERALL FLOOR PLAN |
| A2.11 | LEVEL 1 PARTIAL FLOOR PLAN A |
| A2.12 | LEVEL 1 PARTIAL FLOOR PLAN B |
| A3.11 | LEVEL 1 PARTIAL REFLECTED CEILING PLAN A |
| A3.12 | LEVEL 1 PARTIAL REFLECTED CEILING PLAN B |
| A4.00 | ENLARGED FLOOR PLANS & DETAILS |
| A4.11 | ENLARGED REFLECTED CEILING PLANS |
| A8.00 | INTERIOR ELEVATIONS |
| A8.01 | INTERIOR ELEVATIONS |
| A8.51 | INTERIOR MILLWORK DETAILS |
| A8.52 | INTERIOR MILLWORK DETAILS |
| A8.53 | INTERIOR WALL DETAILS |
| A8.54 | INTERIOR MILLWORK DETAILS |

| Sheet № | Sheet Name |
|---|---|
| **MECHANICAL** | |
| M0.01 | MECHANICAL SYMBOL LEGEND |
| **MECHANICAL DEMO** | |
| MD2.11 | LEVEL 1 PARTIAL DEMOLITION MECHANICAL PLAN A |
| MD2.12 | LEVEL 1 PARTIAL DEMOLITION MECHANICAL PLAN B |
| **MECHANICAL** | |
| M2.11 | LEVEL 1 PARTIAL MECHANICAL PLAN A |
| M2.12 | LEVEL 1 PARTIAL MECHANICAL PLAN B |
| M3.11 | LEVEL 1 PARTIAL MECHANICAL CONTROLS PLAN A |
| M3.12 | LEVEL 1 PARTIAL MECHANICAL CONTROLS PLAN B |
| M5.01 | MECHANICAL SCHEDULES |
| M5.02 | MECHANICAL SCHEDULES |
| M6.01 | MECHANICAL DETAILS |
| **ELECTRICAL** | |
| E0.01 | ELECTRICAL SYMBOL LEGEND |
| E2.01 | LEVEL 1 COMPOSITE ELECTRICAL PLAN |
| **ELECTRICAL POWER DEMO** | |
| EPD2.10 | LEVEL 1 PARTIAL DEMOLITION ELECTRICAL POWER PLAN A |
| EPD2.11 | LEVEL 1 PARTIAL DEMOLITION ELECTRICAL POWER PLAN B |
| **ELECTRICAL POWER** | |
| EP2.10 | LEVEL 1 PARTIAL ELECTRICAL POWER PLAN A |
| EP2.11 | LEVEL 1 PARTIAL ELECTRICAL POWER PLAN B |
| EP3.10 | LEVEL 1 PARTIAL ELECTRICAL HVAC POWER PLAN A |
| EP3.11 | LEVEL 1 PARTIAL ELECTRICAL HVAC POWER PLAN B |
| **ELECTRICAL LIGHTING DEMO** | |
| ELD2.10 | LEVEL 1 PARTIAL DEMOLITION ELECTRICAL LIGHTING PLAN A |
| ELD2.11 | LEVEL 1 PARTIAL DEMOLITION ELECTRICAL LIGHTING PLAN B |
| **ELECTRICAL LIGHTING** | |
| EL2.10 | LEVEL 1 PARTIAL ELECTRICAL LIGHTING PLAN A |
| EL2.11 | LEVEL 1 PARTIAL ELECTRICAL LIGHTING PLAN B |
| **ELECTRICAL** | |
| E4.01 | POWER RISER DIAGRAM |
| E5.01 | ELECTRICAL SCHEDULES |
| E6.01 | ELECTRICAL DETAILS |
| E6.02 | ELECTRICAL DETAILS |
| E6.03 | ELECTRICAL DETAILS |

| Sheet № | Sheet Name |
|---|---|
| **PLUMBING** | |
| P0.01 | PLUMBING SYMBOL LEGEND |
| P2.11 | LEVEL 1 PARTIAL PLUMBING PLAN A |
| P2.12 | LEVEL 1 PARTIAL PLUMBING PLAN B |
| P4.01 | PLUMBING RISERS AND SCHEMATICS |
| P4.02 | PLUMBING RISERS AND SCHEMATICS |
| P5.01 | PLUMBING SCHEDULES |
| P6.01 | PLUMBING DETAILS |
| **TECHNOLOGY** | |
| T0.01 | TECHNOLOGY SYMBOL LEGEND |
| **TECHNOLOGY** | |
| T2.10 | LEVEL 1 COMPOSITE TECHNOLOGY PLAN |
| T2.11 | LEVEL 1 PARTIAL TECHNOLOGY PLAN A |
| T2.12 | LEVEL 1 PARTIAL TECHNOLOGY PLAN B |
| T4.01 | TECHNOLOGY RISER DIAGRAMS |
| T6.01 | TECHNOLOGY DETAILS |
| T6.02 | TECHNOLOGY DETAILS |
| T6.03 | AV DETAILS |
| T6.04 | AV DETAILS |
| T6.05 | AV DETAILS |
| T6.06 | AV DETAILS |
| T6.07 | AV DETAILS |
| T6.08 | AV DETAILS |
| T6.09 | AV DETAILS |
| T6.10 | AV DETAILS |

**CLIENT**

THE STATE OF TEXAS · FORT BEND COUNTY

**FORT BEND COUNTY**

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**CONSULTANT**

**REGISTRATION**

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REGISTERED ARCHITECT · 7637 · STATE OF TEXAS

10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX
77469

**PROJECT NUMBER**

1007828.00

**SHEET TITLE**

SHEET INDEX

**SHEET NUMBER**

G0.01

**FILE NAME:** C:\@Revit\Locale\Fort Bend County Justice Center\FBC_ARCH_R23.rvt
**DATE STAMP:** 10/17/2024 10:56:53 AM

# PROJECT GRAPHIC STANDARDS

## PROJECT SYMBOLS

PLAN NORTH — **PLAN NORTH NORTH ARROW**

ALTERNATE: PLAN NORTH — **TRUE NORTH NORTH ARROW**

78.0 — **EXISTING POINT ELEVATION**

79.0 — **NEW OR FINISH POINT ELEVATION**

**LEVEL POINT DATUM POINT**

A208 — **PARTITION TYPE (RE: PARTITION SCHEDULE)**

02123 — **LEVEL DOOR NUMBER (RE: DOOR SCHEDULE)**

ROOM — **ROOM NAME**

02132 — **(RE: ROOM FINISH SCHEDULE) ROOM NUMBER LEVEL SECTOR/AREA**

ALTERNATE: ? A.F.F. — **CEILING TYPE CEILING HEIGHT (RE: ROOM FINISH SCHEDULE)**

? A.F.F.

**EXIT SIGN DIRECTION SYMBOL**

MATCHLINE SEE ? / ? — **MATCHLINE VIEW REFERENCE**

C1 — **CURTAIN PANEL TAG**

W1 — **WINDOW TAG**

L1 — **LOUVER TAG**

ABC-1 — **SPECIALTY EQUIPMENT TAG**

ABC-1 — **FURNITURE TAG**

/ 2 — **REVISION TAG**

A10 — **SHEET KEYNOTE**

**FINISH KEYNOTES:**

F1 — **FLOOR MATERIALS/FINISHES**

G1 — **GLAZING MATERIAL/FINISH**

PT-1 — **WALL MATERIALS/FINISHES**

012233.A1 — **MasterSpec KEYNOTE**

012233.A1 DESCRIPTION — **MasterSpec KEYNOTE w DESCRIPTION**

## PROJECT SYMBOLS

1 / A — **COLUMN LINE REFERENCE**

1 / A — **EXISTING/NEW COLUMN LINE REFERENCE**

10 / A7.01 SIM — **DETAIL NUMBER REFERENCE**

10 / A7.01 SIM — **LARGE CALLOUT REFERENCE SHEET NUMBER**

10 / A7.01 SIM — **SMALL CALLOUT REFERENCE SHEET NUMBER**

ALTERNATES: 10 / A7.101 SIM ?/?

1 / A101 SIM — **EXTERIOR ELEVATION NUMBER SHEET NUMBER REFERENCE**

ALTERNATES: 10 SIM / A101 — 1 / A101 SIM — **INTERIOR ELEVATION NUMBER**

10 / A8.101 — **SHEET NUMBER REFERENCE**

10 / A7.101 SIM — **REFERENCE BUILDING SECTION REFERENCE**

ALTERNATE: 10 / A7.101

10 / A7.101 SIM — **REFERENCE BUILDING SECTION REFERENCE**

**CENTER LINE, & SYMBOL**

**ABOVE LINE**

**BEYOND LINE**

**BREAK LINE**

F1 F1 — **FLOOR FINISH TRANSITION**

ALTERNATE: B1 30 34 24 — ? ?? — **CASEWORK TYPE SIZE (WxH)**

0 4'-0" 8'-0" 16'-0" — **SCALE**

## CONSTRUCTION TYPE SYMBOLS

- EXISTING CONSTRUCTION TO REMAIN
- EXISTING CONSTRUCTION TO BE DEMOLISHED
- NEW NON-RATED CONSTRUCTION
- NEW SMOKE RATED CONSTRUCTION (30 MIN)
- NEW 1 HR. RATED CONSTRUCTION
- NEW 2 HR. RATED CONSTRUCTION
- NEW 3 HR. RATED CONSTRUCTION

## MATERIAL SYMBOLS - PLAN

- BRICK
- CONCRETE MASONRY UNIT
- CONCRETE
- CAST-IN-PLACE CONCRETE
- PRECAST CONCRETE
- STONE
- GRAVEL
- COMPACTED EARTH FILL
- SAND

## MATERIAL SYMBOLS - DETAIL

- STEEL
- OTHER METALS
- BATT INSULATION
- RIGID INSULATION
- GYPSUM BOARD
- PLASTER ON LATH
- PLYWOOD
- MDF BOARD
- FINISHED WOOD
- GLASS
- TILE
- CARPET
- ACOUSTICAL TILE
- CONTINUOUS WOOD BLOCKING
- WOOD SHIM
- GRAVEL
- CONCRETE
- SAND

## RCP REFERENCE SYMBOLS

- RECESSED DOWNLIGHT
- WATERPROOF RECESSED DOWNLIGHT
- PENDANT LIGHT
- SURFACE MOUNTED CEILING LIGHT FIXTURE
- JUNCTION BOX
- WALL SCONCE
- WALL MOUNTED LIGHT
- SURFACE MOUNTED FLUORESCENT LIGHT
- UNDER CABINET LIGHT
- TRACK LIGHT
- CABLE TRACK LIGHT
- SUPPLY AIR GRILLE
- RETURN AIR GRILLE
- EXHAUST AIR GRILLE
- WALL EXHAUST GRILLE
- WALL SUPPLY GRILLE
- ELECTRICAL PANEL
- CONTINUOUS AIR SUPPLY & RETURN SLOT
- SPRINKLER HEAD
- SD — SMOKE DETECTOR
- S — ALARM SPEAKER
- EXIT LIGHT
- WALL WASHERS
- ACCESS PANEL
- EXIT SIGNAGE WITH DIRECTION ARROW TO EXIT DOOR

## RCP REFERENCE SYMBOLS - MECH

- BLDG. STND. SPRINKLER HEAD
- BLDG. STND. SLOT DIFFUSER
- BLDG. STND. LAY-IN SUPPLY AIR GRILLE
- BLDG. STND. LAY-IN RETURN AIR GRILLE
- EF — EXHAUST FAN

*REFER TO MEP DRAWINGS FOR ADDITIONAL INFO.

## RCP REFERENCE SYMBOLS - LIGHTING

- EXISTING LIGHT FIXTURE TO REMAIN
- 2' x 4' FLUORESCENT LIGHT FIXTURE BUILDING STANDARD, UNO.
- 2' x 2' FLUORESCENT LIGHT FIXTURE BUILDING STANDARD, UNO
- RECESSED DOWNLIGHT
- RECESSED WALL WASHER
- WALL MOUNTED SCONCE RE: ELEVATIONS FOR MOUNTING HEIGHT
- EXIT SIGN FIXTURE BUILDING STANDARD, UNO
- FLUORESCENT STRIP LIGHT
- TRACK WITH LIGHT FIXTURE
- 1' x 4' OR 1' x 8' PENDANT FIXTURE
- CEILING MOUNTED PROJECTOR
- T-BAR SUSPENDED CEILING GRID SYSTEM RE: SHEET A2.1.2 FOR ADDITIONAL INFORMATION.

## MATERIAL SYMBOLS - OTHER

# GENERAL PROJECT NOTES

| NO. | DESCRIPTION |
|---|---|
| 1. | The Construction Documents are to include AIA document A201"General Conditions of the Contract for Construction". Fort Bend County, Texas shall be designated as "The Owner", PGAL Architects shall be designated as "The Architect". **"COMPANY NAME HERE"* shall be designated as "The Landlord". The AIA document shall also include the Agreement, Performance and Payment Bonds, General Conditions, Supplementary Conditions, the Specifications, the Drawings Addendum, and Contract Modifications, Building Rules and Regulations & any other documents required by the Owner. |
| 2. | The General Contractor shall be both licensed and bonded in Texas and shall provide documents upon request. |
| 3. | The Work shall be done in accordance with the rules and regulations of all applicable safety and building codes, and as approved by the Authority Having Jurisdiction. The General Contractor is responsible for securing and paying for all permits required for the Work and for the scheduling of all required inspections during the course of the Work. |
| 4. | The General Contractor shall review and verify existing conditions as provided in the Construction Documents. The Contractor shall notify the Architect of all discrepancies, errors, inconsistencies or ambiguities prior to proceeding with the Work. |
| 5. | The General Contractor shall be responsible for, and provide protection of, any existing finishes, materials, and equipment to remain. The General Contractor shall repair or replace any damaged finishes, materials, and equipment as a result of the work. All existing finishes to remain shall be cleaned at the completion of construction. The General Contractor shall photograph and document all existing damages, and provide to the Architect, prior to proceeding with the Work. |
| 6. | All materials and systems shall be installed per manufacturer's specifications. All construction shall be of industry standard or better. The Architect shall be final judge of quality. |
| 7. | Only new materials and equipment of recent manufacture, of standard quality and free from defects, will be permitted in the Work, unless otherwise noted. Rejected materials and equipment shall be removed immediately from the Work and replaced with materials and equipment of the quality specified. Failure to remove rejected materials and equipment shall not relieve the General Contractor from the responsibility for quality of material and equipment used nor from any other obligation imposed by the Contract. |
| 8. | Do not scale drawings. Stated & written dimensions govern. The General Contractor shall verify all dimensions in the field and shall be responsible for their accuracy. No extra charge or compensation shall be allowed because of difference between actual dimensions and those indicated on the drawings, unless they contribute to a change in the scope of the Work. Any difference found shall be submitted to the Architect for coordination prior to ordering, manufacturing, or proceeding with the Work. Horizontal dimensions indicated are to/from face of finish, unless noted otherwise. Vertical dimensions are from top of floor slab except where noted to be above finished floor (AFF). Dimensions are not adjustable without approval of Architect unless noted +/-. |
| 9. | In the event of conflict between data shown on drawings and data provided in the specification, the specification shall govern. Detail drawings take precedent over drawings of larger scope. The Contractor shall provide written notification to the Architect of any discrepancies, prior to proceeding with the Work. In case of an inconsistency between Drawings and Specifications or within either Document, not clarified by Addendum, the more specific provision shall take precedence. |
| 10. | The General Contractor shall verify that no conflicts exist between the locations of existing and proposed new mechanical, electrical, plumbing, data, and sprinkler equipment (including but not limited to structural members, piping, duct work, conduit and sprinklers) and that clearances for installation and maintenance of equipment are provided. Elements in conflict shall be documented and provided to the Architect prior to proceeding with the Work. |
| 11. | The General Contractor shall provide the Architect with shop drawings for review and approval, for all, but not limited to, the following: shop-fabricated millwork, carpet layout, flooring, light fixtures, doors, misc. steel, metal fabrication, glass/glazing, sprinkler layouts, hardware. Shop drawings shall be submitted electronically in pdf format. Shop drawings shall not be reproductions of Contract Documents. Material Submittals (3 samples) shall be provided for wood, fasteners, acrylic, carpet, tile, base, paint, laminate and any other materials indicated in the specifications. |
| 12. | The General Contractor shall provide the Architect with manufacturer's cut sheets and specifications for all equipment including but not limited to: light fixtures, plumbing equipment, electrical equipment, fans, supplementary heating and cooling elements, all hardware and security equipment. |
| 13. | The General Contractor shall not proceed with work for which he expects additional compensation beyond the contract amount with out written authorization from the Architect and Owner. Failure to obtain such authorization shall invalidate a claim for extra compensation. The Contractor shall not proceed with work which, if completed in strict conformance with the Construction Documents, will result in additional work beyond the scope of the Contract without written authorization from the Architect and Owner. Any field conditions that significantly vary from the Contract Documents or will result in additional work, shall be brought to the attention of the Architect prior to proceeding with work. |
| 14. | The General Contractor shall include all x-ray and core drill costs if required for the installation of the work. The General Contractor shall review and coordinate the size and location of all slab openings with all related disciplines. The General Contractor shall submit proposed locations of core drilling and slab openings to Architect and Structural Engineer of Record for review and approval prior to proceeding with the Work. |
| 15. | Patch, repair, and install all fireproofing as required by Code. Fireproof all new penetrations as required for approval by the Authority Having Jurisdiction. |
| 16. | The General Contractor shall continuously check architectural and structural clearances for accessibility of equipment and mechanical and electrical systems. No allowances of any kind will be made for the General Contractor's negligence to foresee means of installing equipment into position. |
| 17. | The finished work shall be firm, well-anchored, in true alignment, plumb, level, with smooth, clean, uniform, appearance without waves, distortions, holes, marks, cracks, stains, or discoloration. Jointing shall be close fitting, neat and well scribed. The finished work shall have no exposed unsightly anchors or fasteners and shall not present hazardous, unsafe corners. All work shall have the provision for expansion, contraction and shrinkage as necessary to prevent cracks, buckling, and warping due to temperature and humidity conditions. |
| 18. | Attachments, connections or fasteners of any nature are to properly and permanently be secured in conformance with industry best practices. The drawings highlight special conditions only and by no means illustrate every connection. The Contractor is responsible for improving connection accordingly. |
| 19. | General Contractor shall waive "Common Practice" and "Common Usage" as construction criteria wherever details and Contract Documents of governing codes, ordinances, etc. require quantity or better quality than common practice or common usage would require. |
| 20. | The General Contractor shall submit shop drawings and submittals, and shall order and schedule delivery of materials to avoid delays in construction. If an item is found to be unavailable or to have a long lead time, the General Contractor shall notify Architect immediately with a proposed alternative. |
| 21. | The General Contractor shall notify the Owner and the Architect in writing of any deficiencies in base building work prior to the commencement of the Work. Any unreported deficiencies will become the responsibility of the General Contractor to correct. |
| 22. | The General Contractor shall exercise industry best practices for care and caution during the construction of the Work, and shall schedule work to minimize disturbances to occupants, adjacent spaces and/or structures, property, public thoroughfares, etc. The General Contractor shall take precautions and be responsible for the safety of all building occupants during construction procedures. The General Contractor shall be responsible for any costs incurred. |
| 23. | All debris shall be removed from the site on a daily basis, or as directed by the Authority Having Jurisdiction. Upon completion of the work, remove all debris from the building created by the work provided under this Contract and leave all areas clean. Trash is not permitted to be burned on site. |
| 24. | All abandoned and miscellaneous nails, hangers, staples, wires, conduits and debris shall be removed from exposed areas of the floors, walls, and ceilings. Remove all abandoned pipe sleeves in floor slabs. Patch existing slab as required to maintain UL fire rating of floor slab where pipes and conduits have been removed. |
| 25. | Slab penetrations shall be sealed as required to maintain fire rating, using materials and methods approved by the Authority Having Jurisdiction. Expansion material shall be approved by the Architect. |
| 26. | The General Contractor shall notify the Architect of any access panels which may be required prior to proceeding with the Work. Contractor shall be responsible for coordinating all trades. Required access panels shall be included in the Contractor's scope of Work. |
| 27. | Contractor shall provide the Team with a construction schedule showing the proposed phasing. Long lead items that will affect the Substantial Completion date shall be brought to the Architect's attention immediately. |

# ABBREVIATIONS

| Abbrev | Description |
|---|---|
| A | |
| ABV | above |
| ACOUS | acoustical |
| ACT | acoustical ceiling tile |
| AD | area drain |
| ADJ | adjustable |
| AFF | above finished floor |
| ALT | alternate |
| ALUM | aluminum |
| APPROX | approximate |
| ARCH | architect |
| B | |
| B.O. | bottom of |
| BALC | balcony |
| BD | board |
| BET | between |
| BLDG | building |
| BLKG | blocking |
| BLW | below |
| BM | beam |
| BOT | bottom |
| BRKT | bracket |
| BULKHD | bulkhead |
| BUR | built up roof |
| C | |
| C.G. | corner guard |
| CAB | cabinet |
| CALK | caulking |
| CEM | cement |
| CER | ceramic |
| CJ | control joint |
| CLG | ceiling |
| CLOS | closet |
| CLR | clear |
| CO | cased opening |
| COL | column |
| CONC | concrete |
| CONT | continous |
| CPT | carpet |
| CT | ceramic tile |
| CTR | center |
| D | |
| DBL | double |
| DET | detail |
| DIA | diameter |
| DIM | dimension |
| DN | down |
| DR | door |
| DS | down spout |
| DW | dishwasher |
| DWG | drawing |
| E | |
| E | east |
| EA | each |
| EIFS | exterior insulation & finish system |
| ELEC | electric(al) |
| ELEV | elevation |
| EMER | emergency |
| ENCL | enclosure |

# ABBREVIATIONS

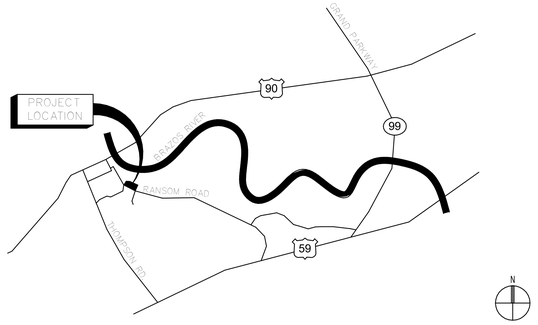
| Abbrev | Description |
|---|---|
| EOS | edge of slab |
| EQ | equal |
| EQUIP | equipment |
| ETR | existing to remain |
| EW | each way |
| EXP. JT. | expansion joint |
| EXST | existing |
| F | |
| F.O. | face of |
| FA | fire alarm |
| FAP | fire annunciuator panel |
| FD | floor drain |
| FE | fire extinguisher |
| FEC | fire extinguisher cabinet |
| FG | finish group |
| FH | fire hydrant |
| FHC | fire hose cabinet |
| FIN | finish |
| FLR | floor |
| FLUOR | fluorescent |
| FT | foot or feet |
| FUR | furring |
| G | |
| GAL | gallon |
| GALV | galvanized |
| GB | grab bar |
| GC | general contractor |
| GL | glass |
| GND | ground |
| GWB | gypsum board |
| GYP | gypsum |
| H | |
| H.W.H. | hot water heater |
| HC | handicapped |
| HDWD | hardwood |
| HDWR | hardware |
| HM | hollow metal |
| HORIZ | horizontal |
| HR | hour |
| HT | height |
| I | |
| ID | inner diameter |
| INCAN | incandescent |
| INSUL | insulation |
| INT | interior |
| J | |
| JAN | janitor |
| JST | joist |
| JT | joint |
| L | |
| LAM | laminate |
| LAV | lavatory |
| LB(S) | pounds |
| LDG | landing |
| LT | light |

# ABBREVIATIONS

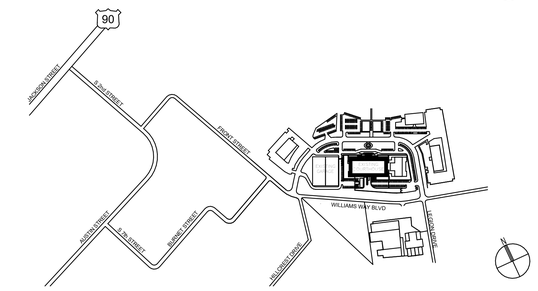
| Abbrev | Description |
|---|---|
| M | |
| MAX | maximun |
| MECH | mechanical |
| MEMB | membrane |
| MFR | manufacturer |
| MIN | minimum |
| MISC | miscellaneous |
| MO | masonry opening |
| MTD | mounted |
| MTL | metal |
| N | |
| N | north |
| NIC | not in contract |
| NO | number |
| NOM | nominal |
| NTS | not to scale |
| O | |
| O.P. | overflow pipe |
| OA | overall |
| OC | on center |
| OD | outside diameter |
| OFF | office |
| OH | opposite hand |
| OPG | opening |
| OPP | opposite |
| P | |
| PART | partition |
| PERIM | perimeter |
| PG | paint grade |
| PLAM | plastic laminate |
| PLAS | plaster |
| PLYWD | plywood |
| PR | pair |
| PT | paint |
| PTD | painted |
| R | |
| R | riser |
| RAD | radius |
| RCP | reflected ceiling plan |
| RD | roof drain |
| RE | refer |
| REF | refrigerator |
| REINF | reinforced |
| REQD | required |
| RESIL | resilient |
| RM | room |
| RO | rough opening |
| RTU | root top unit (mech) |
| S | |
| S | south |
| SAFB | sound attenuation fiber batt |
| SC | scupper |
| SCHED | schedule |
| SEAL | sealant |
| SECT | section |
| SF | square foot |
| SHT | sheet |
| SIM | similar |
| SPEC | specification |

# ABBREVIATIONS

| Abbrev | Description |
|---|---|
| SQ | square |
| SS | stainless steel |
| STD | standard |
| STL | steel |
| STOR | storage |
| STRUCT | structural |
| SUSP | suspended |
| SYM | symmetrical |
| T | |
| T | tread |
| T&G | tongue & groove |
| TEL | telephone |
| TER | terrazzo |
| THK | thick |
| THR | threshold |
| TO | top of |
| TYP | typical |
| U | |
| UC | undercut |
| UNFIN | unfinished |
| UNO | unless noted otherwise |
| UON | unless otherwise noted |
| UTIL | utility |
| V | |
| VCT | vinyl compostion tile |
| VERT | vertical |
| VIF | verify in field |
| VTR | vent termination pipe |
| VWC | vinyl wall covering |
| W | |
| W | west |
| W/ | with |
| W/O | without |
| WC | watercloset |
| WIN | window |
| WP | waterproof |
| WS | wetstack |
| WSCT | wainscot |
| WT | weight |




**LOCATION MAP** 12" = 1'-0" (3)




**VICINITY MAP** 12" = 1'-0" (2)

**CLIENT**

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10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

1007828.00

**SHEET TITLE**

GENERAL PROJECT INFORMATION

**SHEET NUMBER**

G0.02

**FILE NAME:** C:\@Revit\Locale\Fort Bend County Justice Center\FBC_ARCH_R23.rvt
**DATE STAMP:** 10/17/2024 10:56:57 AM

# CODE ANALYSIS

THESE DOCUMENTS ARE BASED ON THE FOLLOWING CODES AND STANDARDS:

2015 INTERNATIONAL BUILDING CODE
2015 INTERNATIONAL FIRE CODE
2015 INTERNATIONAL FUEL GAS CODE
2017 NATIONAL ELECTRIC CODE NFPA 70
2015 INTERNATIONAL MECHANICAL CODE
2015 INTERNATIONAL ENERGY CONSERVATION CODE
2015 INTERNATIONAL PLUMBING CODE
2012 TEXAS ACCESSIBILITY STANDARDS (TAS)

CONSTRUCTION TYPE:
TYPE IB, FULLY SPRINKLERED

OCCUPANCY TYPES (NONSEPARATED USES):
GROUP A-3: ASSEMBLY USES, INCLUDING COURTROOMS

GROUP B: BUSINESS AND OFFICE USES, INCLUDING CIVIC ADMINISTRATION

GROUP I-3, CONDITION 4: INSTITUTIONAL USES, INCLUDING JAILS WITH REMOTE-CONTROLLED RELEASE FOR LOWER LEVEL ADULT AND JUVENILE HOLDING AREAS

ALL COURTROOM HOLDING AREAS ON FLOORS 1, 2 & 3 ARE CONSIDERED TO BE ACCESSORY USE TO THE COURTROOM OCCUPANCY. DOORS HAVE MANUAL RELEASE.

ALLOWABLE HEIGHT AND BUILDING AREAS PER IBC TABLE 503:

MAXIMUM HEIGHT = 160'-0"

GROUP A-3 11 MAX. STORIES UNLIMITED MAX. AREA

GROUP B 11 MAX. STORIES UNLIMITED MAX. AREA

GROUP I-3 4 MAX. STORIES UNLIMITED MAX. AREA

DEAD END CORRIDOR MAX. = 50'-0"

FIRE RESISTANCE RATING FOR BUILDING ELEMENTS PER IBC TABLE 601 & 602

| BUILDING ELEMENT | RATING IN HOURS |
|---|---|
| STRUCTURAL FRAME INCLUDING COLUMNS, GIRDERS, TRUSSES | 2, (SEE NOTE 1) |
| EXTERIOR BEARING WALLS | 2 |
| INTERIOR BEARING WALLS | 2, (SEE NOTE 1) |
| EXTERIOR NON BEARING WALLS | 0 - OVER 30' FROM PROPERTY LINE |
| INTERIOR NON BEARING WALLS | NON CONBUSTIBLE |
| FLOOR CONSTRUCTION INCLUDING SUPPORTING BEAMS & JOISTS | 2 |
| ROOF CONSTRUCTION INCLUDING SUPPORTING BEAMS & JOISTS | 1, NOTE 2 |

NOTE 1:
STRUCTURAL FRAME MEMBERS HAVE BEEN REDUCED TO 1 HOUR PER 601. FOOTNOTE A. WHERE SUPPORTING ONLY A ROOF AT THE ENTRY VESTIBULE.

NOTE 2:
PROTECTION OF ROOF FRAMINNG AND DECKING IS NOT PROVIDED WHERE EVERY MEMBER OF THE ROOF CONSTRUCTION IS 20' OR MORE ABOVE THE FLOOR AT THE LEVEL 4 ROTUNDA PER TABLE 601, FOOTNOTE B.

TYPICAL BUILDING FRAME AND FLOORS ARE 2-HOUR RATED CONCRETE CONSTRUCTION PER IBC 2015 TABLE 721.1 (1), ITEMS NO. 5-1.1, 6-1.2 & 7-1.2 FOR SILICEOUS AGGREGATE CONCRETE, AND TABLE 720.1 (3), ITEM NO. 1-1.1 FOR FLOOR AND ROOF SYSTEMS.

STRUCTURAL STEEL FRAME AND ROOF DECK COMPONENTS ARE RATED 1 & 2 HOURS WHERE REQUIRED PER UL #P732 (ROOF) AND UL #X772 (FRAME). REQUIRED AT LEVEL 1 SECURITY VESTIBULE (ENTRANCE 10002) ROOF STRUCTURE. ALSO PROVIDE AT CENTRAL PLANT ROOF STRUCTURE.

BUILDING AREA (SQ.FT.)

| | GROSS | NET |
|---|---|---|
| BASEMENT | 67,519 | 20,784 |
| LEVEL 1 | 69,840 | 69,236 |
| LEVEL 2 | 65,990 | 62,405 |
| LEVEL 3 | 65,990 | 62,405 |
| LOWER ROOF | 4496 | 1158 |
| TOTAL AREA | 273,835 | 215,988 |

IBC 2015 TABLE 508.4
FIRE SEPARATIONS BASED ON OCC.

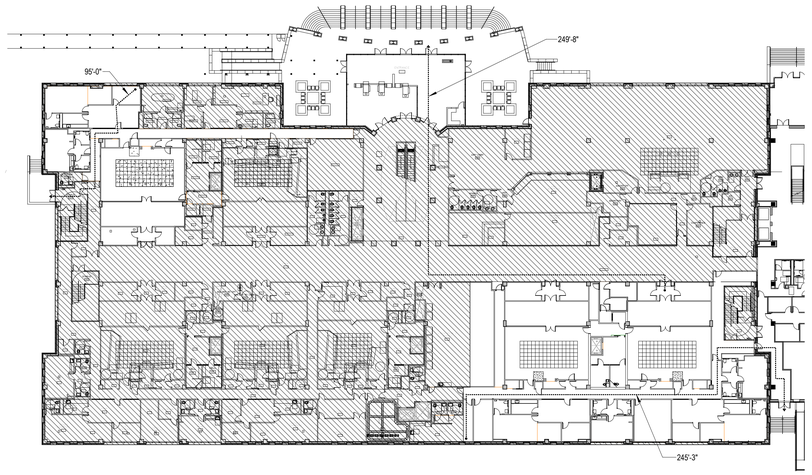
| OCC. GROUP | RATING (HOURS) |
|---|---|
| A - B | 1 |
| A - I | 1 |
| I - B | 1 |

IFC 2015 TABLE 803.911
INTERIOR WALL AND CEILING FINISH REQUIREMENTS BY OCCUPANCY

| GROUP | SPRINKLERED BUILDING | | |
|---|---|---|---|
| | INTERIOR EXIT STAIRWAYS, INTERIOR EXIT RAMPS AND EXIT PATHWAYS | CORRIDORS AND ENCLOSURE FOR EXIT ACCESS STAIRWAYS AND EXIT ACCESS RAMPS | ROOMS AND ENCLOSED SPACES |
| A-3 | B | B | C |
| B | B | C | C |
| I-3 | A | A | C |
| S | C | C | C |
| U | NO RESTRICTIONS | | |

# LIFE SAFETY PLAN NOTES

1. REFER TO G0.11 FOR TYPICAL ACCESSIBLE INFORMATION.
2. REFER TO SHEET A0.10 FOR PARTITION TYPES.
3. REFER TO SHEET A0.20 FOR FINISHES.
4. REFER TO SHEET A0.30 FOR DOOR SCHEDULE.




EXIT ANALYSIS LEVEL 1 1/32" = 1'-0" (1)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10/17/2024

DRAWING HISTORY

| № | DATE | DESCRIPTION |
|---|---|---|
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PROJECT NAME
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

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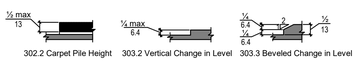
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

PROJECT NUMBER
1007828.00

SHEET TITLE
LIFE SAFETY CODE ANALYSIS

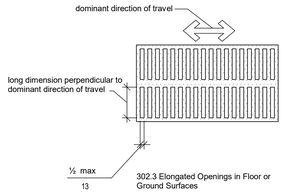
SHEET NUMBER
G0.10

FILE NAME: C:\@Revit\Locale\Fort Bend County Justice Center\FBC_ARCH_R23.rvt
DATE STAMP: 10/17/2024 11:20:13 AM



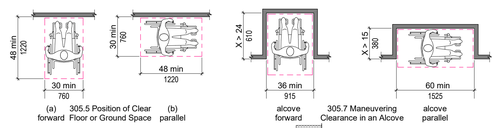

302.2 Carpet Pile Height  303.2 Vertical Change in Level  303.3 Beveled Change in Level

## 302 - Floor or Ground Surfaces



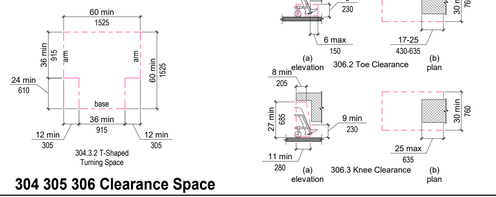

302.3 Elongated Openings in Floor or Ground Surfaces

## 302 Floor or Ground Surfaces




(a) forward 305.5 Position of Clear Floor or Ground Space (b) parallel

alcove forward 305.7 Maneuvering Clearance in an Alcove alcove parallel

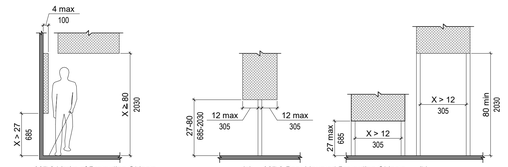



304.3.2 T-Shaped Turning Space

(a) elevation 306.2 Toe Clearance (b) plan

(a) elevation 306.3 Knee Clearance (b) plan

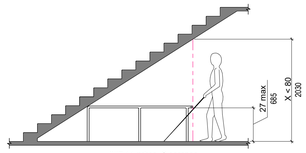
## 304 305 306 Clearance Space




307.2 Limits of Protruding Objects



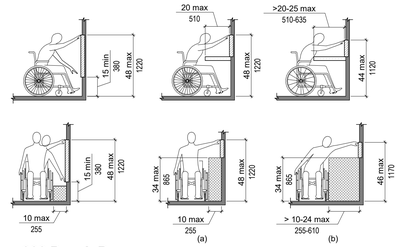

(a) 307.3 Post-Mounted Protruding Objects (b)




307.4 Vertical Clearance

## 307 Limits of Protruding Objects

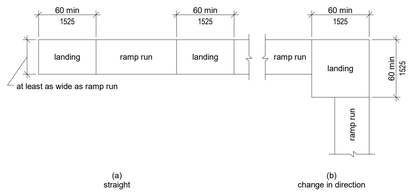
NOTE: NOT ALL DETAILS OR CONDITIONS SHOWN ON THIS SHEET WILL BE USED .




(a) (b)

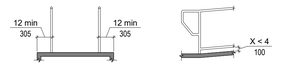
## 308 Reach Ranges

# CHAPTER 3: BUILDING BLOCKS



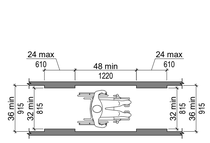

(a) straight (b) change in direction

## 405.7 Ramp Landings

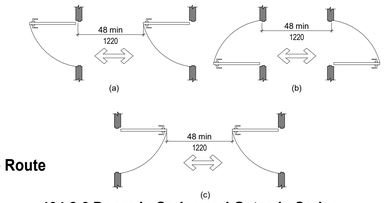



405.9.2 Curb or Barrier Edge Protection  405.9.2 Curb or Barrier Edge Protection

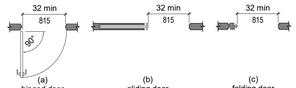
## 405.9 Extended Floor or Ground Surface




## 403.5.1 Clear Width of an Accessible Route

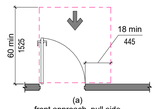



## 404.2.6 Doors in Series and Gates in Series

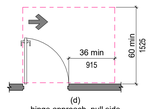



(a) hinged door (b) sliding door (c) folding door

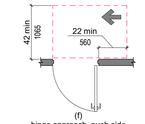
404.2.3 Clear Width of Doorways



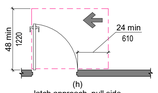

(a) front approach, pull side



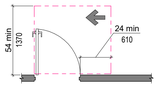

(d) hinge approach, pull side



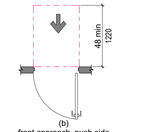

(f) hinge approach, push side



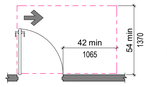

(h) latch approach, pull side



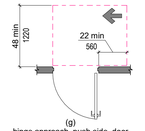

(i) latch approach, pull side, door provided with closer



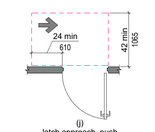

(b) front approach, push side



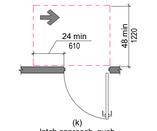

(e) hinge approach, pull side



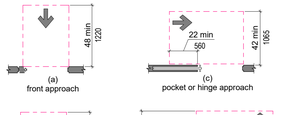

(g) hinge approach, push side, door provided with both closer and latch




(j) latch approach, push side

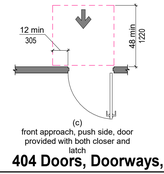



(k) latch approach, push side, door provided with closer

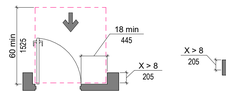



(a) front approach (c) pocket or hinge approach (b) side approach (d) stop or latch approach

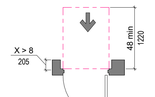
404.2.4.2 Maneuvering Clearance at Sliding and Folding Doors




(c) front approach, push side, door provided with both closer and latch

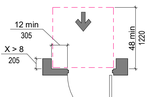



(a) pull side



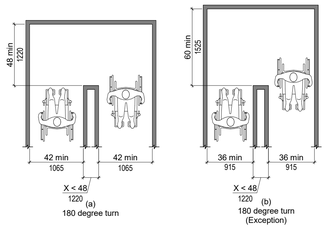

(b) push side

404.2.4.3 Maneuvering Clearance at Recessed Doors and Gates




(c) push side, door provided with both closer and latch

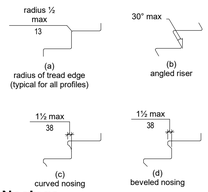
## 404 Doors, Doorways, and Gates



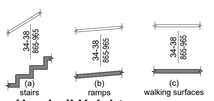

(a) 180 degree turn (b) 180 degree turn (Exception)

## 403.5.2 Clear Width at Turn

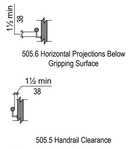
# CHAPTER 4: ACCESSIBLE ROUTES



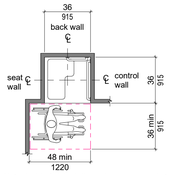

## Stair Nosings




## Handrail Height

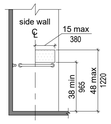



## Handrail Clearance

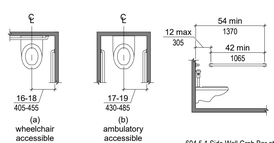



Note: inside finished dimensions measured at the center points of opposing sides.

608.2.1 Transfer Type Shower Compartment Size and Clearance.



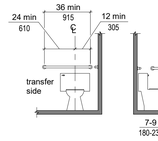

608.5.1 Transfer Type Shower Compartment Control Location




(a) wheelchair accessible water closets (b) ambulatory accessible water closets

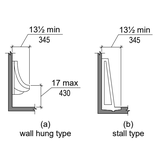
604.2 Water Closet Location

604.5.1 Side Wall Grab Bar at Water Closets



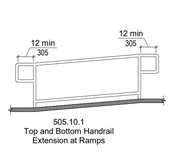

604.5.2 Rear Wall Grab Bar at Water Closets

604.7 Dispenser Outlet Location



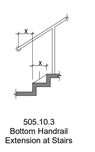

(a) wall hung type (b) stall type

605.2 Height and Depth of Urinals



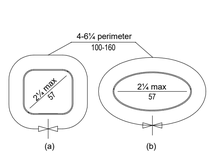

505.10.1 Top and Bottom Handrail Extension at Ramps

505.10.2 Top Handrail Extension at Stairs



505.10.3 Bottom Handrail Extension at Stairs

## 505.10 Hardrails Extensions

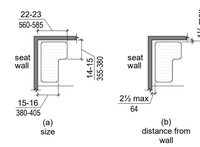



(a) (b)

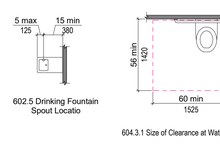
## 505.7.2 Handrail Non-Circular Cross Section

608.3.1 Grab Bars for Transfer Type Showers

## 608 Showers

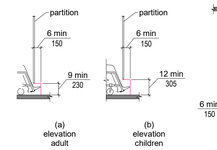



610.3.2 L-Shaped Shower Seat

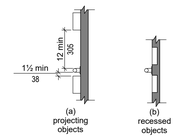



604.3.1 Size of Clearance at Water Closets

## 603 Toilet and Bathing Rooms



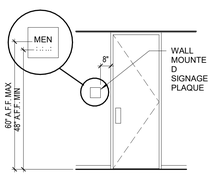

604.8.1.4 Wheelchair Accessible Toilet Compartment Toe Clearance




609.3 Spacing of Grab Bars

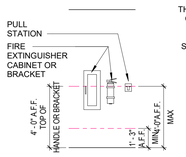
## Spacing of Grab Bars

# CHAPTER 5: GENERAL SITE AND BUILDING ELEMENTS



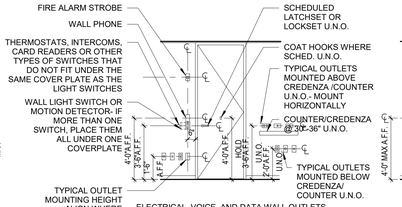

TACTILE CHARACTERS ON SIGNS SHALL BE LOCATED 48" A.F.F. MIN MEASURED FROM THE BASELINE OF THE LOWEST TACTILE CHARACTER AND 60" A.F.F. MAX MEASURED FROM THE BASELINE OF THE HIGHEST TACTILE CHARACTER.

ADA SIGNAGE

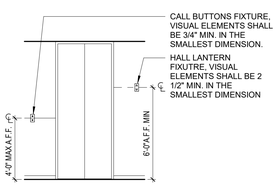



NOTE: FIRE EXTINGUISHER CANNOT PROTRUDE MORE THAN 4"

FIRE PROTECTION

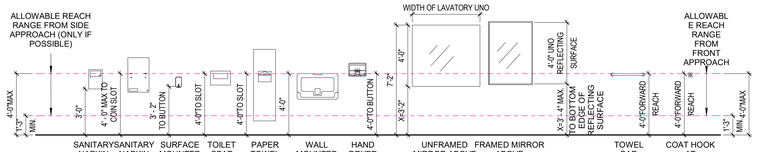



TYPICAL




ELEVATOR

# CHAPTER 6: PLUMBING ELEMENTS AND FACILITIES




NOTE: ALL MAXIMUM MOUNTING HEIGHTS TO BE TAKEN FROM FINISH FLOOR TO HIGHEST OPERABLE PART (COIN SLOTS, HANDLES, ETC. OF ACCESSORY)

NOTE: X=3' - 1" MAX. WHERE MIRROR IS NOT LOCATED ABOVE COUNTERS/LAVATORIES

TYPICAL INSTALLATION HEIGHTS

### Graphic Convention for Figures

| Convention | Description |
|---|---|
| 36 / 915 | dimension showing English units (in inches unless otherwise specified) above the line and SI units (in millimeters unless otherwise specified) below the line |
| 6 / 150 | dimension for small measurements |
| 33-36 / 840-915 | dimension showing a range with minimum - maximum |
| min | minimum |
| max | maximum |
| > | greater than |
| ≥ | greater than or equal to |
| < | less than |
| ≤ | less than or equal to |
| | boundary of clear floor space or maneuvering clearance |
| ℄ | centerline |
| | a permitted element or its extension |
| | direction of travel or approach |
| | a wall, floor, ceiling or other element cut in section or plan |
| | a highlighted element in elevation or plan |
| | location zone of element, control or feature |

FILE NAME: C:\@Revit\Locale\Fort Bend County Justice Center\FBC_ARCH_R23.rvt
DATE STAMP: 10/17/2024 10:57:02 AM

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CONSULTANT

REGISTRATION

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REGISTERED ARCHITECT 26372 STATE OF TEXAS
10/17/2024

DRAWING HISTORY

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

PROJECT NAME
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

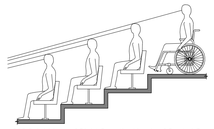
PROJECT LOCATION
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

PROJECT NUMBER
1007828.00

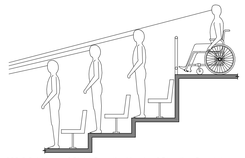
SHEET TITLE
ADA STANDARDS

SHEET NUMBER
G0.11

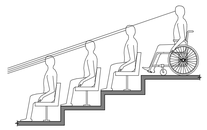
NOTE: NOT ALL DETAILS OR CONDITIONS SHOWN ON THIS SHEET WILL BE USED .



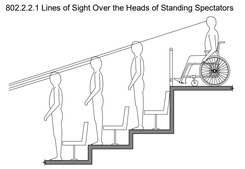
802.2.1.1 Lines of Sight Over the Heads of Seated Spectators



802.2.2.1 Lines of Sight Over the Heads of Standing Spectators

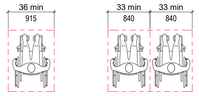


802.2.1.2 Lines of Sight Between the Heads of Seated Spectators



802.2.2.2 Lines of Sight Between the Heads of Standing Spectators

**Lines of Sight Over the Heads of Seated Spectators**




**Width of Wheelchair Spaces in Assembly Areas**

## CHAPTER 8: SPECIAL ROOMS, SPACES AND ELEMENTS

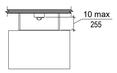



705.1 Size and Spacing of Truncated Domes

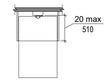
703.6
Pictogram Field

703.7.2.4 International
Symbol of Access for
Hearing Loss

703.7.2.1 International
Symbol of Accessibility




704.2.1.1
Parallel Approach to Telephone




704.2.1.2
Forward Approach to Telephone

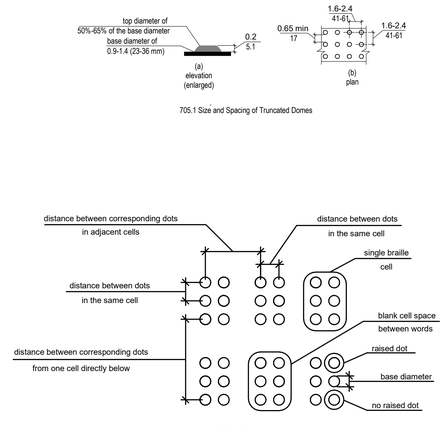
(a)
12-key
ascending

(b)
12-key
descending

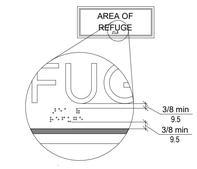
707.6.2
Numeric Key Layout

703.7.2.3 Volume-Controlled
Telephone

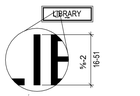
703.7.2.2 International TTY
Symbol



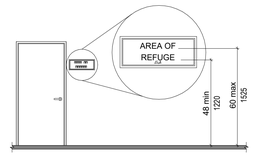

703.3.1 Braille Measurement



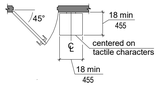

703.3.2 Position of Braille




703.2.5 Height of Raised Characters

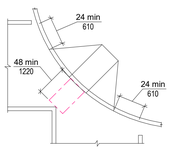



703.4.1 Height of Tactile Characters Above Floor or Ground

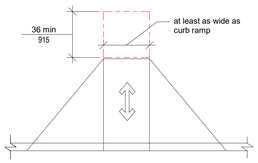



703.4.2 Location of Tactile Signs at Doors

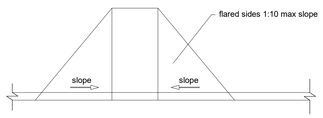
## CHAPTER 7: COMMUNICATION ELEMENTS AND FEATURES



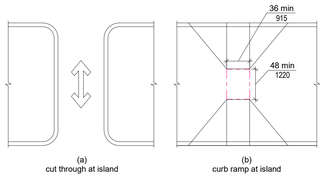

**Diagonal or Corner Type Curb Ramps**




**Landings at the Top of Curb Ramps**

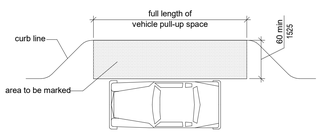



**Sides of Curb Ramps**

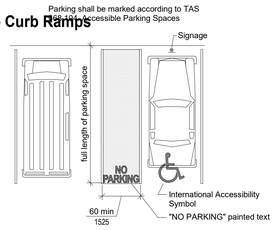



**Islands in Crossings**

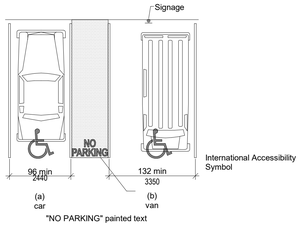
**Counter Slope of Surfaces Adjacent to Curb Ramps**




**Passenger Loading Zone Access Aisle**

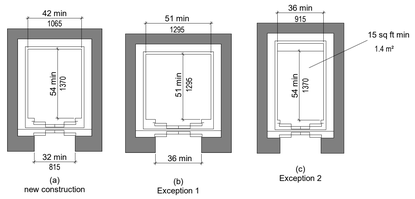



**Parking Space Access Aisle**



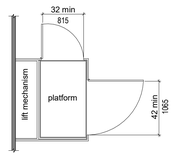

**Vehicle Parking Spaces**

## CHAPTER 5: GENERAL SITE AND BUILDING ELEMENTS

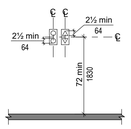



**408.4.1 Limited Use/Limited Application (LULA) Elevator Car and Door Sizes**

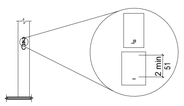
## CHAPTER 408 - LIMITED USE / LIMITED APPLICATION ELEVATORS



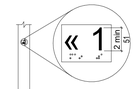

410.5 Platform Lift Doors and Gates



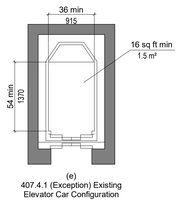

407.0.2.2.2 Visible Hall Signals

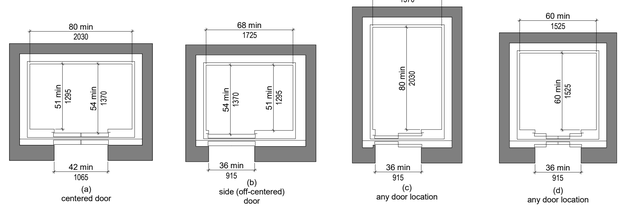



407.2.3.2
Car Designations on Jambs of Destination-
Oriented Elevator Hoistway Entrances




407.2.3.1
Floor Designations on Jambs of
Elevator Hoistway Entrances




**407.4.1 Elevator Car and Door Sizes**

## CHAPTER 407 - ELEVATORS


**CLIENT**

THE STATE OF TEXAS
FORT BEND COUNTY

**FORT BEND COUNTY**

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RICHMOND, TX 77469
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**ARCHITECT**

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**REGISTRATION**

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REGISTERED ARCHITECT
"637"
STATE OF TEXAS

10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE
HEIMANN CIRCLE
RICHMOND, TX
77469

**PROJECT NUMBER**

1007828.00

**SHEET TITLE**

ADA STANDARDS

**SHEET NUMBER**

G0.12

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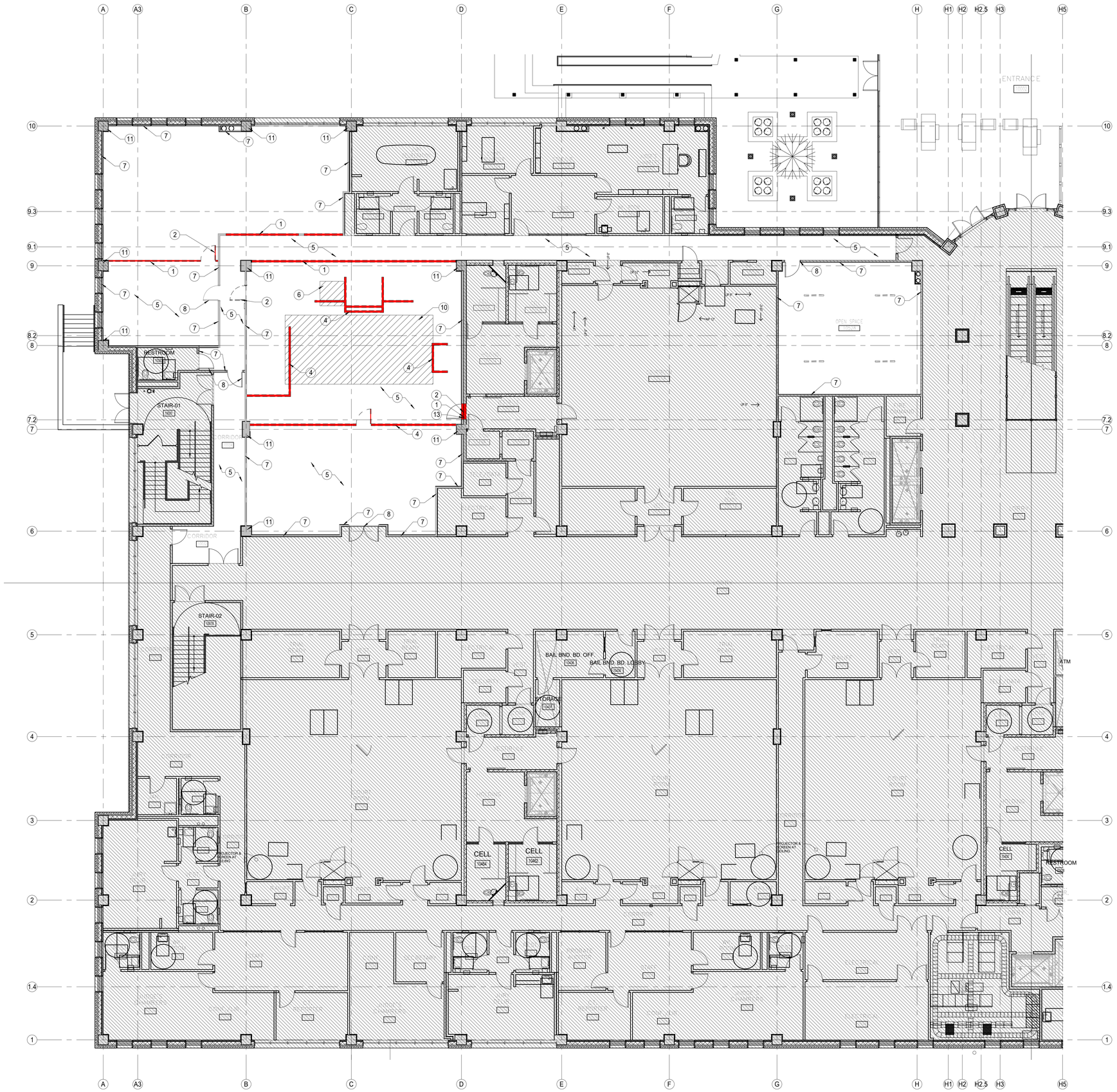


LEVEL 1 PARTIAL FLOOR PLAN 1/8" = 1'-0" (1)

# DEMOLITION NOTES

1. DEMOLISHED MATERIALS SCHEDULED FOR REUSE SHALL BE CAREFULLY REMOVED AND PROPERLY STORED UNTIL REUSED IN THIS PROJECT. MATERIALS TO BE REUSED THAT ARE DAMAGED DURING DEMOLITION, STORAGE OR REINSTALLATION SHALL BE REPLACED BY THE CONTRACTOR AT NO COST TO PROJECT.
2. REMOVE DEBRIS FROM THE SITE AND DISPOSE OF IT IN A LEGAL MANNER. DO NOT LET DEMOLISHED MATERIALS ACCUMULATE.
3. ALL MATERIAL AND PRODUCTS DESIGNATED FOR REMOVAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS NOTED OTHERWISE.
4. PATCH EXISTING PARTITIONS TO REMAIN WITH MATERIALS TO MATCH PARTITION TYPE WHERE EXISTING PARTITION IS DAMAGED OR HAS BEEN PARTIALLY DEMOLISHED BY ADJACENT DEMOLITION, REMOVAL, OR ADDITION OF MEP DEVICES OR OTHERWISE NECESSARY TO COMPLETE.
5. BRACE EXISTING PARTITIONS AND CONSTRUCTION AS REQUIRED WHERE TOTAL OR PARTIAL DEMOLITION HAS ALTERED STRUCTURAL INTEGRITY OF EXISTING CONSTRUCTION.
6. MAINTAIN EXIT PATHS REQUIRED BY BUILDING OFFICIALS THROUGHOUT DEMOLITION AND CONSTRUCTION.
7. CONDUCT DEMOLITION WORK IN SUCH A WAY AS TO ALLOW FOR SAFE USE OF EXISTING BUILDING BY STAFF AND PUBLIC.
8. IF HAZARDOUS MATERIALS ARE DISCOVERED OR ENCOUNTERED OR MATERIALS THAT ARE SUSPICIOUS OF BEING HAZARDOUS, IMMEDIATELY STOP WORK AND ASK ARCHITECT FOR DIRECTION.
9. WHERE APPLICABLE, CONTRACTOR SHOULD PROTECT ANY CONSTRUCTION OR FINISHED EXISTING TO REMAIN. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO ANY CONSTRUCTION EXISTING TO REMAIN.
10. REFER TO SPECIFICATIONS FOR ADDITIONAL DEMOLITION INFORMATION AND REQUIREMENTS.

# KEYED NOTES

1. EXISTING PARTITION/FURRING TO BE DEMOLISHED AND REMOVED.
2. EXISTING DOOR AND FRAME TO BE REMOVED AND STORED FOR FUTURE USE.
3. EXISTING WINDOW TO BE DEMOLISHED AND REMOVED.
4. EXISTING MILLWORK TO BE DEMOLISHED AND REMOVED.
5. EXISTING CARPET/TILE TO BE DEMOLISHED AND REMOVED. TURN OVER CARPET TILES TO OWNER.
6. EXISTING CONCRETE INFILL TO BE BROKEN OUT. PREPARE FOR NEW WHEELCHAIR LIFT.
7. EXISTING PARTITION TO REMAIN.
8. EXISTING DOOR AND FRAME TO REMAIN.
9. EXISTING FEC TO BE REMOVED AND STORED FOR FUTURE USE.
10. EXISTING CONCRETE INFILL TO BE BROKEN OUT. PREPARE FOR NEW ACCESS FLOOR.
11. EXISTING COLUMN TO REMAIN.
12. EXISTING ELEVATOR SHAFT TO REMAIN.
13. PORTION OF EXISTING CMU WALL TO BE DEMOLISHED.
14. DEMOLISH WALL UP TO 8'-10". RETAIN FURRDOWN.

# LEGEND

- EXISTING WALL TO BE DEMOLISHED
- EXISTING WALLS TO REMAIN
- EXISTING DOOR, FRAME, AND HARDWARE TO BE DEMOLISHED
- EXISTING DOOR, FRAME, AND HARDWARE TO REMAIN
- EXISTING BUILDING
- EXTENT OF WORK

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10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
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**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

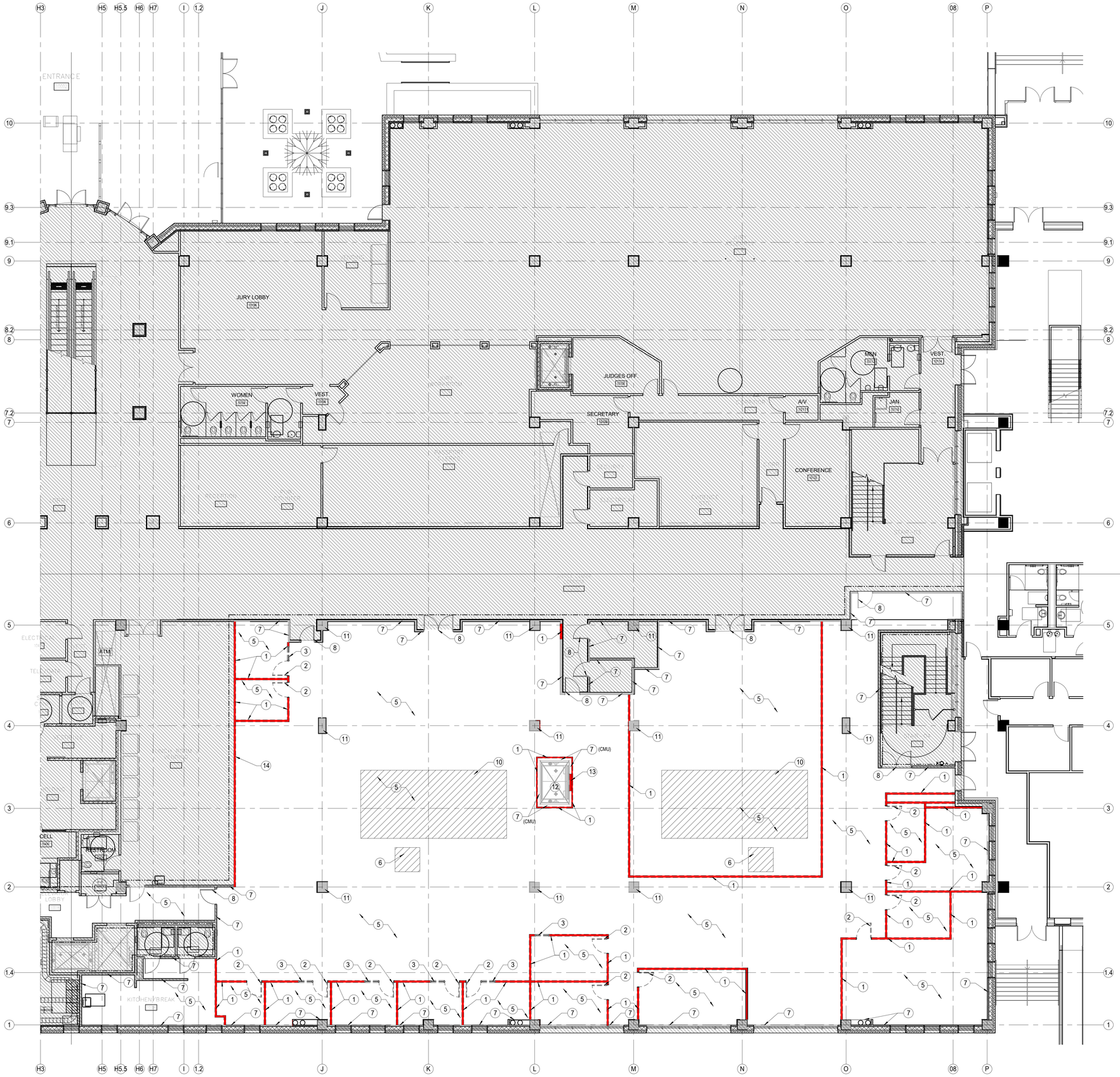
1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL DEMOLITION FLOOR PLAN A

**SHEET NUMBER**

D2.11




## LEVEL 1 PARTIAL DEMOLITION FLOOR PLAN B

1/8" = 1'-0" (1)

# DEMOLITION NOTES

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10. REFER TO SPECIFICATIONS FOR ADDITIONAL DEMOLITION INFORMATION AND REQUIREMENTS.

# KEYED NOTES

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- EXISTING DOOR, FRAME, AND HARDWARE TO REMAIN
- EXISTING BUILDING
- EXTENT OF WORK

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**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX
77469

**PROJECT NUMBER**

1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL DEMOLITION FLOOR PLAN B

**SHEET NUMBER**

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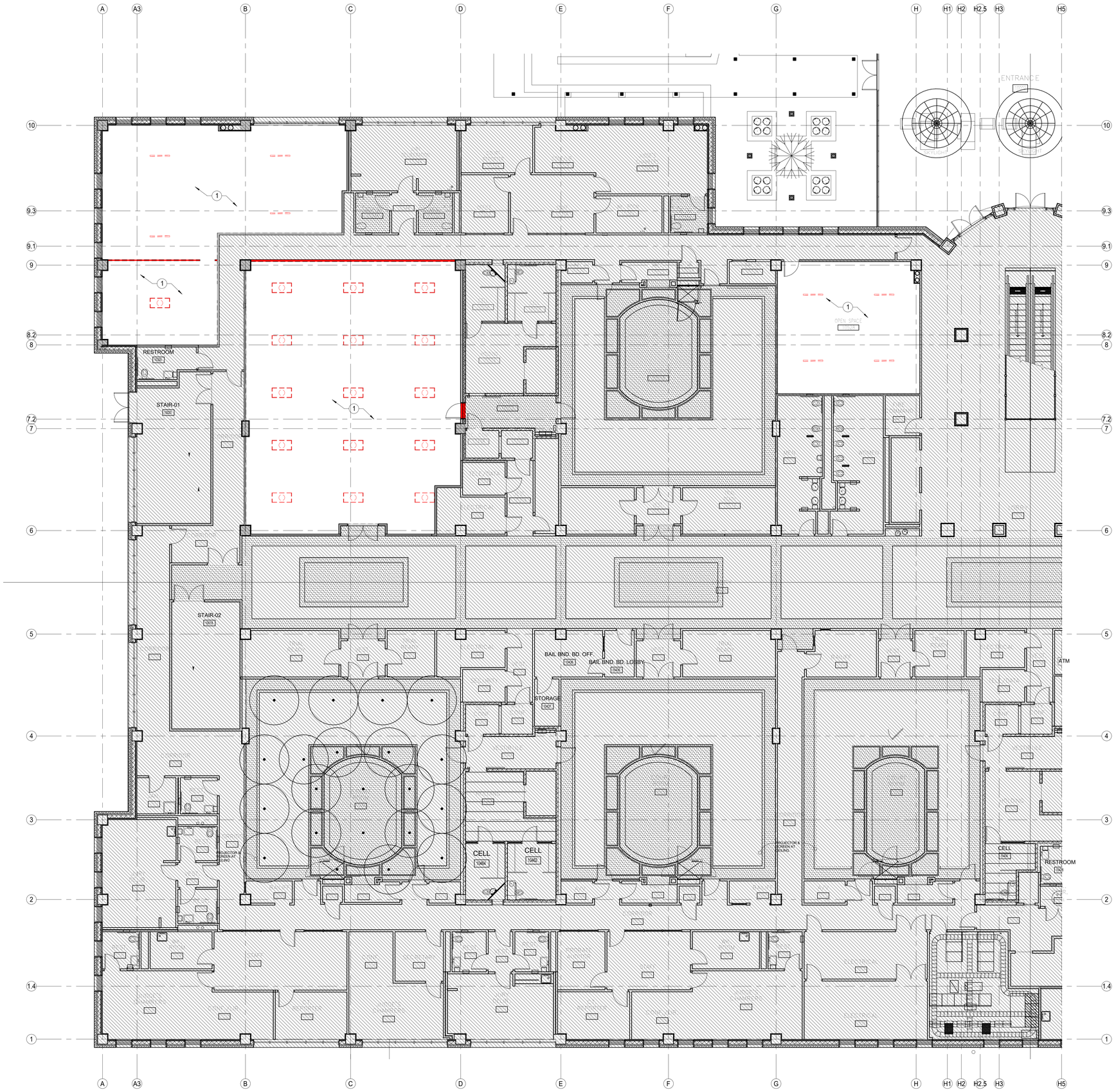


## GENERAL DEMO RCP NOTES

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## KEYED NOTES

1. DEMOLISH AND REMOVE EXISTING CEILING. EXISTING LIGHT FIXTURES AND CEILING MOUNTED DEVICE TO BE REMOVED AND STORED FOR REUSE.
2. DEMOLISH WALL UP TO 8'-10". RETAIN FURRDOWN.

**LEVEL 1 PARTIAL DEMOLITION REFLECTED CEILING PLAN A** 1/8" = 1'-0" (1)


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RICHMOND, TX 77469

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1007828.00

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LEVEL 1 PARTIAL DEMOLITION REFLECTED CEILING PLAN A

**SHEET NUMBER**

D3.11

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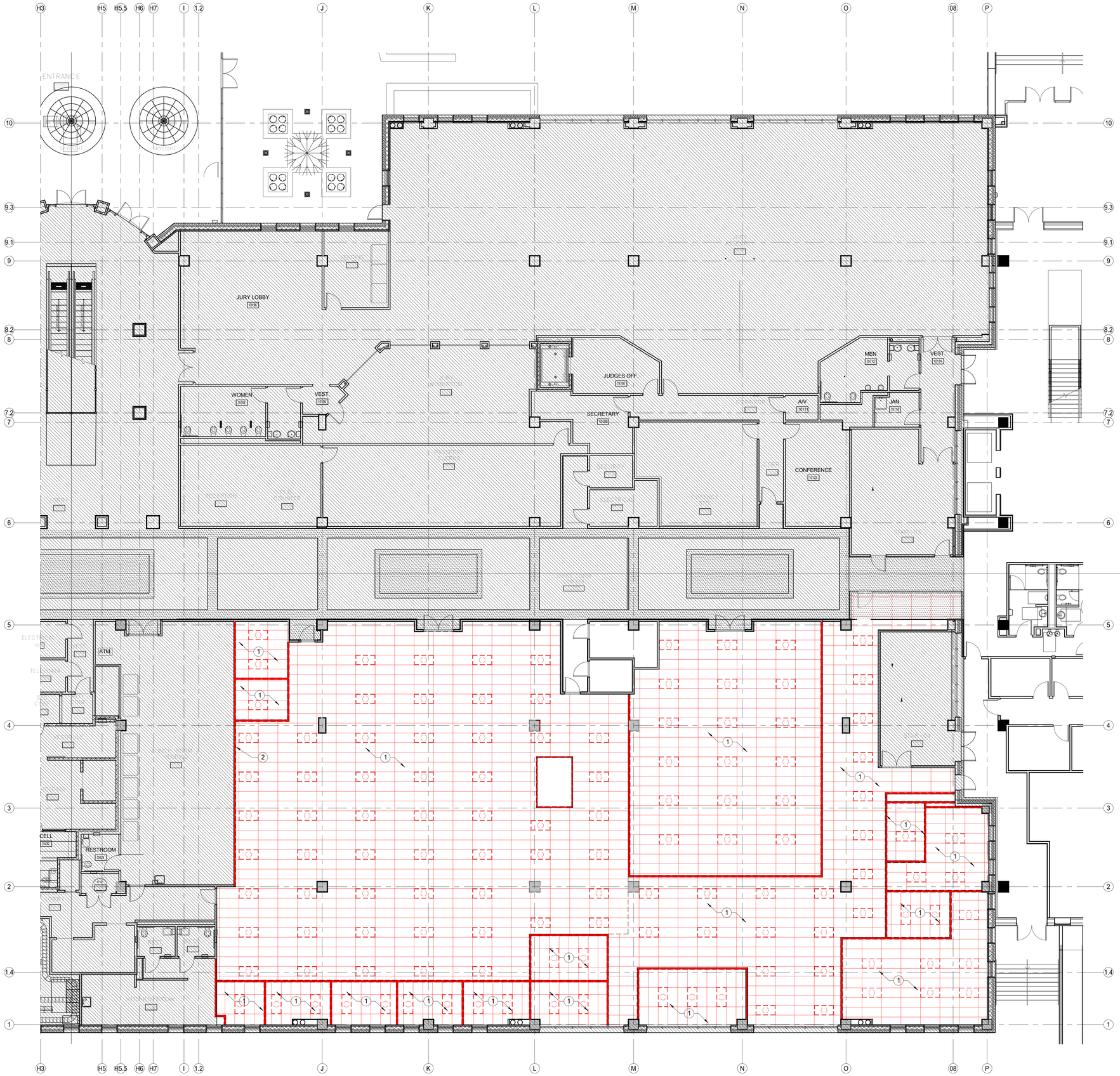


LEVEL 1 PARTIAL DEMOLITION REFLECTED CEILING PLAN B 1/8" = 1'-0" (1)

## GENERAL DEMO RCP NOTES

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## KEYED NOTES

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LEVEL 1 PARTIAL DEMOLITION REFLECTED CEILING PLAN B

**SHEET NUMBER**

D3.12

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**DATE STAMP:** 10/17/2024 10:57:17 AM

# GENERAL NOTES

1. ALL POSSIBLE VARIATIONS OF PARTITIONS TYPES AND U.L. FIRE RATINGS ARE NOT NECESSARILY UTILIZED IN THIS PROJECT AND ARE SHOWN FOR REFERENCE ONLY UNLESS RATED PARTITIONS ARE INDICATED ON THE FLOOR PLANS. WHERE U.L. RATED PARTITIONS ARE INDICATED, REFER TO FLOOR PLANS AND PROVIDE FIRE SEALANT AT THOSE LOCATIONS AS REQUIRED.

2. WHERE FULL HEIGHT PARTITIONS ARE PERPENDICULAR TO SPAN OF STRUCTURAL JOISTS OR GIRDERS, THE PARTITION SHALL EXTEND TO THE UNDERSIDE OF STRUCTURE, FLOOR OR ROOF ASSEMBLY, AND FOLLOW THE LINE OF STRUCTURE.

3. PROVIDE CEMENTITIOUS BACKER BOARD ON ALL WALLS TO RECEIVE CERAMIC TILE FINISH. PROVIDE WATER RESISTANT GYPSUM PANELS ON CEILINGS IN ROOMS THAT INCLUDE SHOWERS. FRAMING NOT TO EXCEED SPACING RECOMMENDED BY MANUFACTURER.

4. PROVIDE ONE LAYER OF 5/8" MOISTURE RESISTANT GYPSUM BOARD AT WALLS BEHIND SINKS AND LAVATORIES WITHOUT TILE. MOISTURE RESISTANT GYPSUM BOARD SHALL BE INSTALLED WITHIN 2' OF ALL URINALS AND WATER CLOSETS, TO A HEIGHT OF 4' AFF.

5. WHERE FIRE RESISTIVE CONSTRUCTION IS INDICATED, PROVIDE TYPE X-W/R BOARD. IN CONDITIONS WHERE NOTE 3 AND 4 APPLY, INSTALL 1 LAYER OF APPLICABLE MOISTURE RESISTANT BOARD OR CEMENTITIOUS BACKER BOARD OVER THE TYPE X-W/R BOARD. INSTALL PER MANUFACTURER LIMITATIONS.

6. STC RATINGS SHOWN FOR SOUND WALLS ARE BASED ON: LABORATORY TESTED ASSEMBLIES AND DO NOT NECESSARILY INDICATE THE ACTUAL STC RATING OF THE COMPLETED WORK. PROVIDE MTL. DECK FILLERS WHERE FULL HEIGHT PARTITIONS ARE PERPENDICULAR TO SPAN OF DECK. DECK FILLERS ARE TO BE COMPATIBLE WITH ALL FIRE RATED ASSEMBLIES AND ARE TO BE APPROVED BY ALL GOVERNING AGENCIES.

7. PROVIDE FIRE TREATED WOOD BLOCKING, SHEET METAL OR STEEL BACKING IN PARTITIONS TO SUPPORT WALL MOUNTED ITEMS AND EQUIPMENT, ETC.

8. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.

# PLAN GRAPHICS LEGEND

1. UNDERWRITERS LABORATORY AND OTHER TESTING AGENCY DESIGNATIONS INDICATED FOR FIRE RESISTIVE CONSTRUCTION ARE GIVEN FOR PURPOSES OF DESCRIBING CONSTRUCTION REQUIREMENTS ONLY AND ARE NOT INTENDED TO LIMIT MANUFACTURERS OF MATERIALS. COMPLY WITH THE CONSTRUCTION REQUIREMENTS OF THE INDICATED DESIGN.

2. WHERE FIRE RESISTIVE WALL CONSTRUCTION IS INDICATED, PROVIDE "TYPE X" GYPSUM WALLBOARD, AND FIRE RATED SEALANT AT PERIMETER JOINTS AND ALL PENETRATIONS, TYPICAL BOTH SIDES OF PARTITION AS INDICATED ON THE U.L. DETAILS AND ASSEMBLIES.

3. U.L. DESIGN REFERS TO FIRE RESISTANT DIRECTORY'S MOST RECENT ISSUE.

# PARTITION FRAMING NOTES

ALL METAL STUDS TO BE 20 ga. AND PLACED AT 16 INCHES O.C. UNLESS NOTED OTHERWISE OR WHERE THE LIMITING HEIGHT REQUIRES 16ga AT 16" O.C.

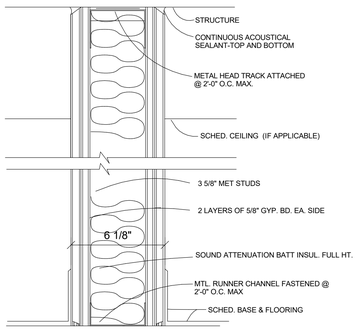
1. ALL FURRING CHANNELS TO BE 25 ga. AND PLACED AT 16 INCHES O.C. UNLESS NOTED OTHERWISE.

2. PARTITIONS SUPPORTING WALL HUNG PLUMBING FIXTURES SHALL BE 16 ga. AND PLACED 16 INCHES O.C.

3. REFER TO STRUCTURAL DRAWINGS FOR STUD ga. SIZE AND SPACING FOR ALL STRUCTURALLY DESIGNED PARTITIONS.

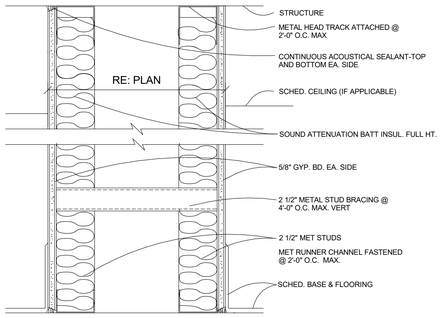
4. REFER TO ASTM C754 FOR LIMITING HEIGHTS CRITERIA. LIMITING HEIGHTS ARE TO BE DETERMINED BY DEFLECTION CRITERIA RATIO OF L/240, AND LATERAL PRESSURE OF 5 PSF UNLESS NOTED OTHERWISE OR DICTATED OTHERWISE BY PRESIDING BUILDING CODE. WHERE FLOOR TO STRUCTURE HEIGHT OF PARTITION EXCEEDS THE INDICATED LIMITING HEIGHT, PROVIDE SUPPLEMENTAL BRACING TO THE STRUCTURE OVERHEAD AS REQUIRED TO MAINTAIN REQUIRED DEFLECTION RATIO.

5. FOR PARTITIONS WITH "BRITTLE" FINISHES SUCH AS PLASTER AND CERAMIC TILE, DESIGN PARTITION SYSTEM TO MAINTAIN DEFLECTION RATIO WITHIN L/360. SUSPENDED CEILINGS SHALL NOT BE CONSIDERED AS BRACING.



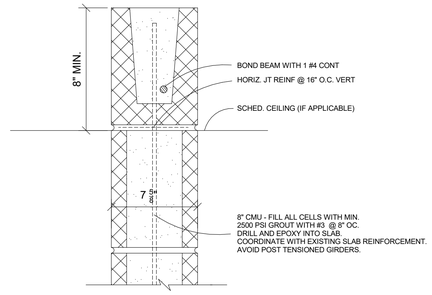

TYPE Z - WITH 3 1/2" THICK SOUND ATTENUATION BATT INSULATION

## PARTITION TYPE Z 3" = 1'-0" 12



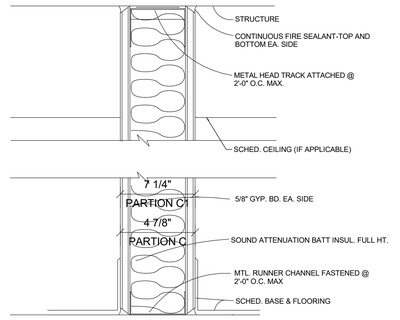

TYPE T - WITH 2 1/2" THICK SOUND ATTENUATION BATT INSULATION

## PARTITION TYPE T 3" = 1'-0" 9




TYPE N - 8" SECURE WALL

## PARTITION TYPE N 3" = 1'-0" 6




TYPE C, C1 - WITH 3 1/2" THICK SOUND ATTENUATION BATT INSULATION 1 HOUR RATED PER UL #U465
TYPE C2 - EXISTING PARTITION TYPE C, C1

## PARTITION TYPE C, C1, C2 3" = 1'-0" 3




TYPE W - FURRING

## PARTITION TYPE W 3" = 1'-0" 11




TYPE S - WITH PARITION TYPE B ( NOT RATED)

## PARTITION TYPE S 3" = 1'-0" 8



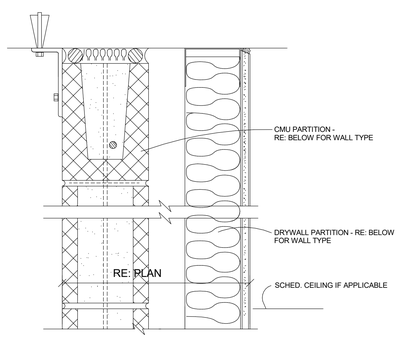

TYPE G - WITH 3 1/2" THICK SOUND ATTENUATION BATT INSULATION 2 HOUR RATED PER UL #U411
TYPE G1 - WITHOUT SOUND ATTENUATION BATT INSULATION 2 HOUR RATED PER UL #U411

## PARTITION TYPE G 3" = 1'-0" 5



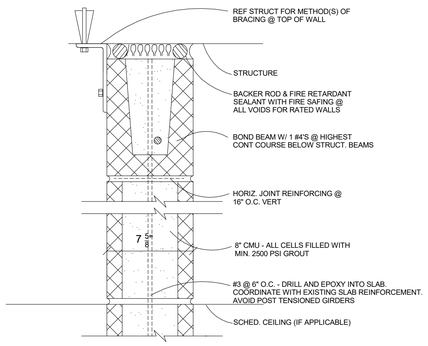

TYPE B - WITH 3 1/2" THICK SOUND ATTENUATION BATT INSULATION
TYPE B1 - WITHOUT SOUND ATTENUATION BATT INSULATION
TYPE B2 - EXISTING PARTITION TYPE A TO BE EXTEND TO DECK AND BECOME PARTITION TYPE B

## PARTITION TYPE B, B1, B2 3" = 1'-0" 2



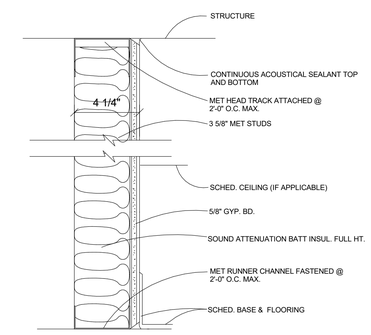

TYPE V - PARTITION TYPE P (2 HOUR RATED) AND TYPE D
TYPE V2 - PARTITION TYPE P3 AND TYPE D

## PARTITION TYPE V, V2 3" = 1'-0" 10



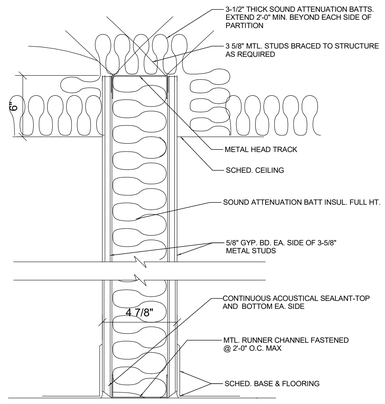

TYPE P - 2-HOUR RATED SECURE WALL PER U.L. #U906
TYPE P2 - NON-RATED SECURE WALL - FILL VOIDS @ TOP OF WALL WITH BATT INSULIN LIEU OF FIRE SAFING
TYPE P3 - EXISTING PARTITION TYPE P

## PARTITION TYPE P,P2,P3 3" = 1'-0" 7




TYPE D - WITH 3 1/2" THICK SOUND ATTENUATION BATT INSULATION TYPE

## PARTITION TYPE D 3" = 1'-0" 4




TYPE A - WITH 3 1/2" THICK SOUND ATTENUATION BATT INSULATION
TYPE A1 - WITHOUT SOUND ATTENUATION BATT INSULATION

## PARTITION TYPE A, A1 3" = 1'-0" 1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10/17/2024

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1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

1007828.00

**SHEET TITLE**

PARTITION TYPES

**SHEET NUMBER**

A0.10

**FILE NAME:** C:\@Revit\Locale\Fort Bend County Justice Center\FBC_ARCH_R23.rvt
**DATE STAMP:** 10/17/2024 10:57:18 AM

# FINISH MATERIAL LEGEND

## PLASTIC LAMINATE

**PL1**
Desc: PLASTIC LAMINATE
Location: DOORS/JURY WORK ROOM/ COURT ROOM WORK SURFACE
MFR: WILSONART LAMINATE
Style:
Color: 7924-07 BILTMORE CHERRY
Size:
Remarks:

**PL2**
Desc: PLASTIC LAMINATE
Location: BREAK ROOM / WORK ROOM
MFR: WILSONART LAMINATE
Style:
Color: 4844-60 LODEN ZEPHYR
Size:
Remarks: COUNTER & BACKSPLASH

**PL3**
Desc: PLASTIC LAMINATE
Location: BREAK ROOM / WORK ROOM
MFR: WILSONART LAMINATE
Style:
Color: PEPPERDUST
Size:
Remarks: CABINETS

**PL4**
Desc: PLASTIC LAMINATE
Location: BAILIFF/ CLERK MILLWORK
MFR: WILSONART LAMINATE
Style:
Color: 4846-60 MORRO ZEPHYR
Size:
Remarks:

## QUARTZ SURFACES

**ST1**
Desc: QUARTZ SURFACE
Location: CRT RM JUDGE'S BENCH, SPECTATOR BENCH, JURY RAIL
MFR: CORIAN QUARTZ
Style:
Color: IRONSTONE
Size:
Remarks:

## ACOUSTICAL CEILING TILE

**C1**
Desc: ACOUSTICAL CEILING TILE
Location: GENERAL
MFR: USG
Style: ECLIPSE CLIMA PLUS 76575
Color: WHITE
Size: 2'X2'
Remarks: MEIDUM TEXTURE 15/16" SUSP. SYSTEM BY MFR.

## GYP. BOARD CEILING PAINT

**C3**
Desc: GYPSUM BOARD CEILING PAINT
Location: COURT ROOM / RESTROOMS
MFR: BENJAMIN MOORE
Style: FLAT FINISH
Color: READY MIX DECORATORS WHITE
Size:
Remarks:

## SECURITY METAL CEILING

**C4**
Desc: SECURITY METAL CEILING
Location: HOLDING CELLS / SECURE AREAS
MFR: TRUSSBILT
Style: BARRIERDEK
Color: MANUFACTURERS STANDARD TBD.
Size: 2' X UP TO 12'
Remarks: WELDED 10GA.

## CARPET

**F1**
Desc: CARPET
Location: COURT ROOMS
MFR: SHAW CONTRACT GROUP
Style: SKYTILE 5T174
Color: VILLAGE 72760
Size: 24" X 24" CARPET TILE
Remarks: DIRECT GLUE, 1/4 TURN PATTERN

**F2**
Desc: CARPET
Location: CORRIDORS / BAILIFF
MFR: SHAW CONTRACT GROUP
Style: MICA TILE/5T014
Color: CINNABAR 14713
Size: 18" X 36" CARPET TILE
Remarks: DIRECT GLUE, ASHLAR PATTERN

**F3**
Desc: CARPET
Location: OFFICES / JUDGE'S CHAMBERS
MFR: SHAW CONTRACT GROUP
Style: MICAT TILE/5T014
Color: CINNABAR 14713
Size: 18" X 36" CARPET TILE
Remarks: RANDOM PATTERN

## SEALED CONCRETE

**F14**
Desc: SEALED CONCRETE
Location: HOLDING CELLS & PRISONER AREAS / JANITOR
MFR:
Style:
Color: CLEAR CONCRETE SEALANT
Size:
Remarks:

## VINYL COMPOSITE TILE

**F18**
Desc: VINYL COMPOSITE TILE
Location: WORK ROOM / AV / STORAGE
MFR: ARMSTRONG
Style: PREMIUM EXCELON CROWN TEXTURE
Color: LINSEED 5C236
Size: 12" X 12"
Remarks: DIRECT GLUE

## CERAMIC TILE

**F23**
Desc: CERAMIC TILE
Location: LUNCH ROOM/VENDING
MFR: DALTILE
Style: VOLUME 1.0
Color: SILVER VL71
Size: 6" X 6"
Remarks:

**F24**
Desc: CERAMIC TILE
Location: LUNCH ROOM/VENDING
MFR: DALTILE
Style: VOLUME 1.0
Color: SONIC WHITE VL75
Size: 6" X 6"
Remarks:

**F25**
Desc: CERAMIC TILE
Location: RESTROOMS
MFR: DALTILE
Style: HAUT MONDE
Color: ARISTOCRAT CREAM HM07
Size: 12" X 24"
Remarks: GROUT COLOR - MAPEI SAHARA BEIGE 11

## STONE

**F26**
Desc: STONE
Location: RESTROOMS
MFR: DALTILE
Style: MARBLE POLISHED THRESHOLD
Color: CHIARO BEIGE M710
Size: 2" X 36" X 3/8"
Remarks: DOUBLE BEVEL

## WOOD BASE

**B1**
Desc: COURT ROOMS
Location:
MFR:
Style:
Color: CHERRY STAIN
Size: 6"
Remarks: MATCH ARCHITECTURAL SAMPLE

## RUBBER BASE

**B2**
Desc: RUBBER BASE
Location: GENERAL
MFR: JOHNSONITE
Style:
Color: 47-BROWN
Size: 4"
Remarks: STRAIGHT AT CARPET SURFACES; COVED AT VCT SURFACES

## CERAMIC BASE

**B4**
Desc: CERAMIC BASE
Location: RESTROOM
MFR: DALTILE
Style: HAUT MONDE
Color: ARISTOCRAT CREAM HM07
Size: 6" X 12" COVED
Remarks: GROUT COLOR - MAPEI SAHARA BEIGE 11

**B6**
Desc: CERAMIC BASE
Location: LUNCH ROOM/VENDING
MFR: DALTILE
Style: VOLUME 1.0
Color: SONIC WHITE VL75
Size:
Remarks:

## PAINT

**W1**
Desc: PAINT
Location: JUDGE'S CHAMBERS ACCENT, EXISTING CORRIDORS
MFR: SHERWIN WILLIAMS
Style:
Color: BAGUETTE SW 6123
Size:
Remarks: FOR REPAIRS IN EXISTING CORRIDORS AS NECESSARY

**W2**
Desc: PAINT
Location: GENERAL
MFR: SHERWIN WILLIAMS
Style:
Color: NATURAL TAN SW7567
Size:
Remarks:

## WALL COVERING

**W14**
Desc: WALL COVERING
Location: COURT ROOMS
MFR: MAHARAM
Style: TEK-WALL SLATE
Color: TREASURE 009
Size: 54" WIDTH
Remarks: INSTALL OVER ACOUSTICAL INFILL, UNBACKED - 100% POLYOLEFIN, PERFORATED BACKING, ROTATE PATTERN TO BE HORIZONTAL

## CERAMIC TILE

**W16**
Desc: CERAMIC TILE
Location: RESTROOMS
MFR: DALTILE
Style: HAUT MONDE
Color: ARISTOCRAT CREAM HM07
Size: 12"X24"
Remarks: SEE ELEVATION FOR PATTERN, GROUT COLOR - MAPEI SAHARA BEIGE 11

## CONCRETE PAINT

**W19**
Desc: CONCRETE PAINT
Location: HOLDING AREAS
MFR: SHERWIN WILLIAMS
Style:
Color: BARCELONA BEIGE SW 7530
Size:
Remarks: EPOXY PAINT

## WALL TILE

**W20**
Desc:
Location: COURT ROOMS
MFR: DALTILE
Style: FLORENTINE
Color: NOCIOLLA FL09
Size: 12"2X4"
Remarks: POLISHED, WALL BEHIND JUDGE'S BENCH, RE: ELEVATIONS, GROUT COLOR - LATICRETE #17 MARBLE BEIGE

## CERAMIC BASE

**W22**
Desc: PAINT
Location: CORRIDOR
MFR: SHERWIN WILLIAMS
Style:
Color: BARCELONA BEIGE SW 7530
Size:
Remarks:

**W23**
Desc: PAINT
Location: RESTROOMS
MFR: SHERWIN WILLIAMS
Style:
Color: PORTICO SW 7548
Size:
Remarks:

## WOOD VENEER

**V1**
Desc: WOOD VENEER
Location: COURT ROOMS / VESTIBULE
MFR:
Style: PLAIN SAWN
Color:
Size:
Remarks: CHERRY WOOD VENEER WITH STAIN TO MATCH ARCHITECT'S SAMPLE, REFER TO INTERIOR ELEVATIONS

## WOOD (SOLID STOCK)

**V2**
Desc: WOOD (SOLID STOCK)
Location: COURT ROOMS / VESTIBULE
MFR:
Style: PLAIN SAWN
Color:
Size:
Remarks: CHERRY WOOD VENEER WITH STAIN TO MATCH ARCHITECT'S SAMPLE

# ROOM FINISH SCHEDULE

| ROOM DATA № | NAME | FLOOR FINISH | BASE FINISH | WALL FINISHES NORTH | WALL FINISHES EAST | WALL FINISHES SOUTH | WALL FINISHES WEST | CEILING FINISH | CEILING HEIGHT | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|
| 10016 | ELEVATOR LOBBY | F2 | B2 | - - | - - | - - | - - | - - | - - | EXISTING CARPET TO BE DEMOLISHED AND REPLACED WITH NEW CARPET (F2) TOUCH UP PAINT (W1) WHERE NECESSARY |
| 10032 | CORRIDOR | F2 | B2 | - - | - - | - - | - - | - - | - - | EXISTING CARPET TO BE DEMOLISHED AND REPLACED WITH NEW CARPET (F2) TOUCH UP PAINT (W1) WHERE NECESSARY |
| 10034 | CORRIDOR | F2 | B2 | - - | - - | - - | - - | - - | - - | EXISTING CARPET TO BE DEMOLISHED AND REPLACED WITH NEW CARPET (F2) TOUCH UP PAINT (W1) WHERE NECESSARY |
| 10036 | CORRIDOR | F2 | B2 | - - | - - | - - | - - | - - | - - | EXISTING CARPET TO BE DEMOLISHED AND REPLACED WITH NEW CARPET (F2) TOUCH UP PAINT (W1) WHERE NECESSARY |
| 10038 | CORRIDOR | F2 | B2 | - - | - - | - - | - - | - - | - - | EXISTING CARPET TO BE DEMOLISHED AND REPLACED WITH NEW CARPET (F2) TOUCH UP PAINT (W1) WHERE NECESSARY |
| 10194 | KITCHEN/BREAK | F18 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | EXISTING MILLWORK TO REMAIN |
| 10200 | LUNCH ROOM / VENDING | - - | B3 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | REFER TO 29/A4.00 FOR TILE PATTER DETAIL |
| 10202 | CORRIDOR | F2 | B2 | W2, V2, W22 | W2, V2, W22 | W2, V2, W22 | W2, V2, W22 | C1 | 9' - 0" | RE; 10/A8.53 FOR WALL DETAIL |
| 10204 | VEST. | F1 | B1 | W2 | W2 | W2 | W2 | C1 | 9' - 2" | |
| 10206 | TRIAL READY | F1 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 2" | |
| 10208 | TRIAL READY | F1 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 2" | |
| 10210 | COURT ROOM | F1 | B1 | W14/V1 | W14/V1 | W14/V1 | W14/V1 | C1/C3 | VARIES | |
| 10212 | BAILIFF | F2 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10214 | STOR. | F18 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10216 | PREP. | F1 | B1 | W2/V1 | W2 | W2/W20 | W2 | C1 | 11' - 2" | |
| 10218 | A/V | F18 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10219 | OPEN SPACE | F18 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10226 | ATTY CONF | F18 | B2 | W19 | W19 | W19 | W19 | C1 | 9' - 0" | |
| 10228 | SEC CONF | F14 | - - | W19 | W19 | W19 | W19 | C4 | 9' - 0" | |
| 10230 | VESTIBULE | F14 | - - | W19 | W19 | W19 | W19 | C3 | 9' - 0" | |
| 10232 | HOLDING | F14 | - - | W19 | W19 | W19 | W19 | C4 | 9' - 0" | |
| 10234 | CELL | F14 | - - | W19 | W19 | W19 | W19 | C4 | 9' - 0" | |
| 10236 | CELL | F14 | - - | W19 | W19 | W19 | W19 | C4 | 9' - 0" | |
| 10238 | VEST. | F1 | B1 | W2 | W2 | W2 | W2 | C1 | 9' - 2" | |
| 10240 | TRIAL READY | F1 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 2" | |
| 10242 | TRIAL READY | F1 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 2" | |
| 10244 | COURT ROOM | F1 | B1 | W14/V1 | W14/V1 | W14/V1 | W14/V1 | C1/C3 | VARIES | |
| 10246 | A/V | F18 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10248 | PREP | F1 | B1 | W2/V1 | W2 | W2/W20 | W2 | C1 | 11' - 2" | |
| 10250 | STOR. | F18 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10252 | BAILIFF | F2 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10254 | CORRIDOR | F2 | B2 | W2, V2, W22 | W2, V2, W22 | W2, V2, W22 | W2, V2, W22 | C1 | 9' - 0" | RE; 10/A8.53 FOR WALL DETAIL |
| 10256 | CORRIDOR | F2 | B2 | W2, V2, W22 | W2, V2, W22 | W2, V2, W22 | W2, V2, W22 | C1 | 9' - 0" | RE; 10/A8.53 FOR WALL DETAIL |
| 10257 | OPEN SPACE | F18 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10258 | STAFF | F3 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10260 | WK. ROOM | F18 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10262 | JUDGE'S CHAMBERS | F3 | B2 | W2 | W1 | W2 | W2 | C1 | 9' - 0" | |
| 10264 | CONF./LIB. | F3 | B2 | W1 | W2 | W2 | - - | C1 | 9' - 0" | |
| 10266 | REST. | F25 | B4 | W23 | W23/W16 | W23 | W23 | C3 | 9' - 0" | |
| 10268 | COURT REPORTER | F3 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10270 | VEST. | F3 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10272 | MEN | F25 | B4 | W23 | W23 | W23 | W23/W16 | C3 | 9' - 0" | |
| 10274 | WOMEN | F25 | B4 | W23 | W23/W16 | W23 | W23 | C3 | 9' - 0" | |
| 10276 | JURY DELIBERATION | F3 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10278 | OPEN SPACE | F3 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10280 | STAFF | F3 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10284 | COURT REPORTER | F3 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10286 | JUDGE'S CHAMBERS | F3 | B2 | W2 | W2 | W2 | W1 | C1 | 9' - 0" | |
| 10288 | CONF./LIB. | F3 | B2 | W1 | - - | W2 | W2 | C1 | 9' - 0" | |
| 10290 | REST. | F25 | B4 | W23 | W23 | W23 | W23/W16 | C3 | 9' - 0" | |
| 10292 | WK. ROOM | F18 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10294 | VEST. | F3 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10296 | WOMEN | F25 | B4 | W23/W16 | W23 | W23 | W23 | C3 | 9' - 0" | |
| 10298 | MEN | F25 | B4 | W23 | W23 | W23/W16 | W23 | C3 | 9' - 0" | |
| 10299 | JURY DELIBERATION | F3 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10306 | VEST. | F1 | B1 | W2 | W2 | W2 | W2 | C1 | 9' - 2" | |
| 10308 | TRIAL READY | F1 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 2" | |
| 10310 | TRIAL READY | F1 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 2" | |
| 10312 | COURT ROOM | F1 | B1 | W14/V1 | W14/V1 | W14/V1 | W14/V1 | C1/C3 | VARIES | |
| 10314 | BAILIFF | F2 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10316 | STOR. | F18 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10318 | PREP. | F1 | B1 | W2/W20 | W2 | W2/V1 | W2 | C1 | 11' - 2" | |
| 10320 | A/V | F18 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10324 | VEST. | F3 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10326 | WOMEN | F25 | B4 | W23 | W23 | W23/W16 | W23 | C3 | 9' - 0" | |
| 10328 | JURY DELIBERATION | F3 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10330 | MEN | F25 | B4 | W23/W16 | W23 | W23 | W23 | C3 | 9' - 0" | |
| 10332 | STAFF | F3 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10334 | WK. ROOM | F18 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10336 | JUDGE'S CHAMBERS | F3 | B2 | W2 | W1 | W2 | W2 | C1 | 9' - 0" | |
| 10338 | CONF./LIB. | F3 | B2 | W2 | W2 | W1 | W2 | C1 | 9' - 0" | |
| 10340 | REST. | F25 | B4 | W23 | W23/W16 | W23 | W23 | C3 | 9' - 0" | |
| 10342 | COURT REPORTER | F3 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |
| 10528 | OPEN SPACE | F3 | B2 | W2 | W2 | W2 | W2 | C1 | 9' - 0" | |

# GENERAL NOTES

1. REFER TO DRAWING G0.01 FOR ADA STANDARD DETAILS.
2. REFER TO DRAWING G0.02 FOR TYPICAL MOUNTING HEIGHTS.
3. REFER TO DRAWING G0.03 FOR PROJECT INFORMATION.
4. REFER TO DRAWING SERIES A0.10 FOR PARTITION TYPES.
5. REFER TO DRAWING SERIES A0.30 FOR DOOR SCHEDULES, TYPES AND DETAILS.
6. REFER TO DRAWING SERIES A0.40 FOR WINDOW SCHEDULES, TYPES, AND DETAILS.
7. REFER TO DRAWING SERIES A0.50 FOR SIGNAGE SCHEDULES AND TYPES.
8. REFER TO DRAWING SERIES D2.00 FOR DEMOLITION FLOOR PLANS.
9. REFER TO DRAWING SERIES A2.00 FOR FLOOR PLANS.
10. REFER TO DRAWING SERIES A3.00 FOR REFLECTED CEILING PLANS.
11. REFER TO DRAWING SERIES A4.00 FOR ENLARGED FLOOR PLANS.
12. REFER TO DRAWING SERIES A8.00 FOR INTERIOR ELEVATIONS AND DETAILS.
13. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
14. PROVIDE FLOORING TRANSITION STRIPS BETWEEN FLOORING MATERIALS PER MANUFACTURERS RECOMMENDATIONS.
15. WHERE OPEN OR GYPSUM WALLBOARD CEILINGS ARE PROPOSED, ALL WALL PENETRATION OPENINGS ARE TO BE KEPT TIGHT TO THE PENETRATING OBJECTS TO ALLOW FOR OPENING TO BE CAULKED AND PAINTED.
16. THE MAXIMUM FLAME-SPREAD OF FINISH MATERIALS USED ON INTERIOR WALLS AND CEILINGS SHALL MEET CLASS B IN ENCLOSED VERTICAL EXITS AND EXIT PASSAGEWAYS, EXIT ACCESS CORRIDORS AND OTHER EXITWAYS, AND CLASS C IN ROOMS AND ENCLOSED SPACES. (BASEDS ON ONE CLASS REDUCTION FOR SPRINKLER SYSTEM, 2006 IBC TABLE 803.5.


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10/17/2024


**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**
1007828.00

**SHEET TITLE**
FINISH MATERIAL LEGEND & SCHEDULE

**SHEET NUMBER**
A0.20

**FILE NAME:** C:\@Revit\Locale\Fort Bend County Justice Center\FBC_ARCH_R23.rvt
**DATE STAMP:** 10/17/2024 10:57:23 AM

# DOOR SCHEDULE

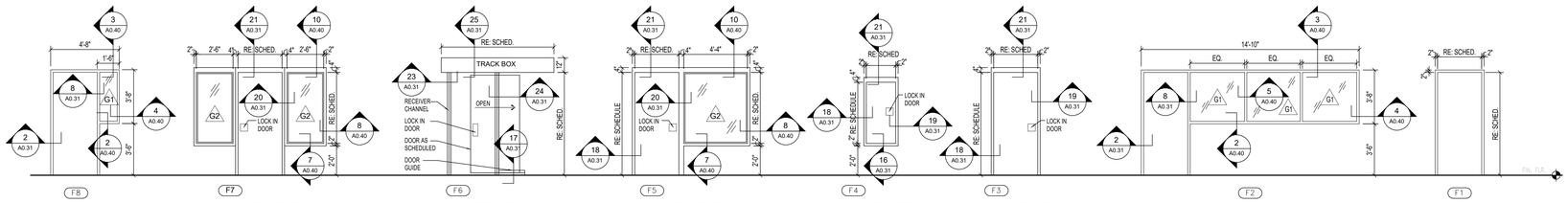
| | | DOOR | | | | | | FRAME | | | | | | GENERAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | SIZE | | | | GLAZING | | | DETAILS | | | FIRE | | |
| MARK | ROOM NAME | TYPE | WIDTH | HEIGHT | THK | MATL | | TYPE | FINISH | HEAD | JAMB | SILL | RATING | HDWR | NOTES |
| 10194 | KITCHEN/BREAK | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 503 | |
| 10206 | TRIAL READY | D2 | 3'-0" | 9'-0" | 1 3/4" | WD/GL | G1 | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 107 | |
| 10208 | TRIAL READY | D2 | 3'-0" | 9'-0" | 1 3/4" | WD/GL | G1 | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 107 | |
| 10210 | COURT ROOM | D4 | 6'-0" | 8'-6" | 1 3/4" | WD/GL | G1 | F1 | HM | 3/A0.31 | 4/A0.31 | - - | - - | 806 | |
| 10210A | COURT ROOM | D3 | 3'-0" | 8'-0" | 1 3/4" | WD | -- | F1 | HM | 3/A0.31 | 4/A0.31 | - - | 45 MIN | C201 | ACCESS CONTROL |
| 10210B | COURT ROOM | D3 | 3'-0" | 8'-6" | 1 3/4" | WD | -- | F1 | HM | 3/A0.31 | 4/A0.31 | - - | 45 MIN | C201 | ACCESS CONTROL |
| 10214 | STOR. | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 203S | |
| 10216 | PREP. | D1 | 3'-0" | 8'-0" | 1 3/4" | WD | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | 45 MIN | C201 | ACCESS CONTROL |
| 10218 | A/V | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 203S | |
| 10219 | OPEN SPACE | D1 | 3'-0" | 7'-0" | 1 3/4" | WD | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 203 | |
| 10226 | ATTY CONF | D1 | 3'-0" | 7'-0" | 1 3/4" | HM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | 45 MIN | C201 | ACCESS CONTROL |
| 10228 | SEC CONF | D6 | 3'-0" | 7'-0" | 2" | SHM | G2 | F3 | SHM | 21/A0.31 | 18 & 19/A0.31 | - - | - - | 001 | DETENTION DOOR |
| 10230 | VESTIBULE | D3 | 3'-0" | 8'-6" | 1 3/4" | WD | -- | F1 | HM | 6/A0.31 | 7/A0.31 | - - | 90 MIN | C201 | DETENTION DOOR, ACCESS CONTROL |
| 10230A | VESTIBULE | D3 | 3'-0" | 8'-6" | 1 3/4" | WD | -- | F1 | HM | 6/A0.31 | 7/A0.31 | - - | 90 MIN | C201 | DETENTION DOOR, ACCESS CONTROL |
| 10232 | HOLDING | D6 | 3'-0" | 7'-0" | 2" | SHM | | F6 | SHM | 25/A0.31 | 23 & 24/A0.31 | - - | - - | 001 | DETENTION DOOR |
| 10234 | CELL | D7 | 3'-0" | 7'-0" | 2" | SHM | G2 | F7 | SHM | 21/A031 | 18 & 19/A0.31 | - - | - - | 001 | DETENTION DOOR |
| 10236 | CELL | D7 | 3'-0" | 7'-0" | 2" | SHM | G2 | F5 | SHM | 21/A031 | 18 & 19/A0.31 | - - | - - | 001 | DETENTION DOOR |
| 10240 | TRIAL READY | D2 | 3'-0" | 9'-0" | 1 3/4" | WD/GL | G1 | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 107 | |
| 10242 | TRIAL READY | D2 | 3'-0" | 9'-0" | 1 3/4" | WD/GL | G1 | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 107 | |
| 10244 | COURT ROOM | D4 | 6'-0" | 8'-6" | 1 3/4" | WD/GL | G1 | F1 | HM | 3/A0.31 | 4/A0.31 | - - | - - | 806 | |
| 10244A | COURT ROOM | D3 | 3'-0" | 8'-0" | 1 3/4" | WD | -- | F1 | HM | 3/A0.31 | 4/A0.31 | - - | 45 MIN | C201 | ACCESS CONTROL |
| 10244B | COURT ROOM | D3 | 3'-0" | 8'-6" | 1 3/4" | WD | -- | F1 | HM | 3/A0.31 | 4/A0.31 | - - | 45 MIN | C201 | ACCESS CONTROL |
| 10246 | A/V | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 203S | |
| 10248 | PREP | D1 | 3'-0" | 8'-0" | 1 3/4" | WD | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | 45 MIN | C201 | ACCESS CONTROL |
| 10250 | STOR. | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 203S | |
| 10256B | CORRIDOR | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | C201 | ACCESS CONTROL |
| 10257 | OPEN SPACE | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 203 | |
| 10258 | STAFF | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F2 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 507 | |
| 10260 | WK. ROOM | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 103 | |
| 10262 | JUDGE'S CHAMBERS | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 103 | |
| 10266 | REST. | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 343 | |
| 10268 | COURT REPORTER | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 103 | |
| 10270 | VEST. | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 401 | |
| 10272 | MEN | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 341 | |
| 10274 | WOMEN | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 341 | |
| 10276 | JURY DELIBERATION | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 503 | |
| 10278 | OPEN SPACE | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 203 | |
| 10280 | STAFF | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F2 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 507 | |
| 10284 | COURT REPORTER | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 103 | |
| 10286 | JUDGE'S CHAMBERS | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 103 | |
| 10290 | REST. | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 343 | |
| 10292 | WK. ROOM | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 103 | |
| 10294 | VEST. | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 401 | |
| 10296 | WOMEN | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 341 | |
| 10298 | MEN | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 341 | |
| 10299 | JURY DELIBERATION | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 503 | |
| 10308 | TRIAL READY | D2 | 3'-0" | 9'-0" | 1 3/4" | WD/GL | G1 | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 107 | |
| 10310 | TRIAL READY | D2 | 3'-0" | 9'-0" | 1 3/4" | WD/GL | G1 | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 107 | |
| 10312 | COURT ROOM | D4 | 6'-0" | 8'-6" | 1 3/4" | WD/GL | G1 | F1 | HM | 3/A0.31 | 4/A0.31 | - - | - - | 806 | |
| 10312A | COURT ROOM | D3 | 3'-0" | 8'-0" | 1 3/4" | WD | -- | F1 | HM | 3/A0.31 | 4/A0.31 | - - | 45 MIN | C201 | ACCESS CONTROL |
| 10312B | COURT ROOM | D3 | 3'-0" | 8'-6" | 1 3/4" | WD | -- | F1 | HM | 3/A0.31 | 4/A0.31 | - - | 45 MIN | C201 | ACCESS CONTROL |
| 10316 | STOR. | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 203S | |
| 10318 | PREP. | D1 | 3'-0" | 8'-0" | 1 3/4" | WD | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | 45 MIN | C201 | ACCESS CONTROL |
| 10320 | A/V | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 203S | |
| 10324 | VEST. | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 401 | |
| 10326 | WOMEN | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 341 | |
| 10328 | JURY DELIBERATION | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 503 | |
| 10330 | MEN | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 341 | |
| 10332 | STAFF | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F2 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 507 | |
| 10334 | WK. ROOM | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 103 | |
| 10336 | JUDGE'S CHAMBERS | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 103 | |
| 10340 | REST. | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 343 | |
| 10342 | COURT REPORTER | D1 | 3'-0" | 7'-0" | 1 3/4" | PLAM | -- | F1 | HM | 1/A0.31 | 2/A0.31 | - - | - - | 103 | |
| 10502 | VESTIBULE | D3 | 3'-0" | 8'-6" | 1 3/4" | WD | -- | F1 | HM | 6/A0.31 | 7/A0.31 | - - | 90 MIN | C201 | DETENTION DOOR, ACCESS CONTROL |

# GENERAL NOTES

1. REFER TO DRAWING G0.01 FOR ADA STANDARD DETAILS.
2. REFER TO DRAWING G0.03 FOR PROJECT INFORMATION.
3. REFER TO DRAWING SERIES A0.10 FOR PARTITION TYPES.
4. REFER TO DRAWING SERIES A0.20 FOR FINISH SCHEDULES AND MATERIALS.
5. REFER TO DRAWING SERIES A0.40 FOR WINDOW SCHEDULES, TYPES, AND DETAILS.
6. REFER TO DRAWING SERIES A0.50 FOR SIGNAGE SCHEDULES AND TYPES.
8. REFER TO DRAWING SERIES A2.00 FOR FLOOR PLANS.
9. REFER TO DRAWING SERIES A3.00 FOR REFLECTED CEILING PLANS.
10. REFER TO DRAWING SERIES A4.00 FOR ENLARGED FLOOR PLANS.
13. REFER TO DRAWING SERIES A8.00 FOR INTERIOR ELEVATIONS AND DETAILS.
14. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

# DOOR SCHEDULE ABBREV.

| | |
|---|---|
| AL | ALUMINUM |
| GL | GLASS |
| SC | SOLID CORE |
| PL | PLASTIC LAMINATE |
| HM | HOLLOW METAL |
| SHM | SECURITY HOLLOW METAL |
| G1 | 1/4" CLEAR TEMP. GLASS |
| G2 | SECURITY GLASS (SG-01B, RE: SPECS) |




F2: PAINTED 16 GA. HOLLOW METAL FRAME (RE: SPECS.)

F7: PAINTED DETENTION GRADE DOOR FRAME (RE: SPECS.)

F6: PAINTED DETENTION GRADE DOOR FRAME (RE: SPECS.)

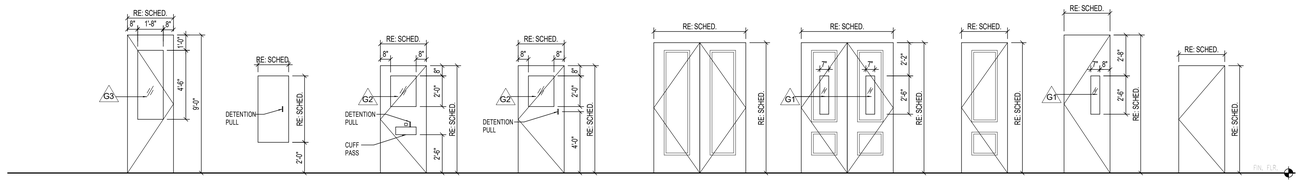
F5: PAINTED DETENTION GRADE DOOR FRAME (RE: SPECS.)

F4: PAINTED DETENTION GRADE DOOR FRAME FOR PLUMBING CHASE

F3: PAINTED DETENTION GRADE DOOR FRAME (RE: SPECS.)

F2: PAINTED 16 GA. HOLLOW METAL FRAME (RE: SPECS.)

F1: PAINTED 16 GA. HOLLOW METAL FRAME (RE: SPECS.)




D9: SOLID CORE WOOD DOOR WITH WOOD VENEER (RE: SPECS.)

D8: SECURITY ACCESS PANEL DOOR (RE: SPECS.)

D7: SECURITY HOLLOW METAL DOOR (RE: SPECS.)

D6: SECURITY HOLLOW METAL DOOR (RE: SPECS.)

D5: SOLID CORE WOOD DOOR WITH WOOD VENEER (RE: SPECS.)

D4: SOLID CORE WOOD DOOR WITH WOOD VENEER (RE: SPECS.)

D3: SOLID CORE WOOD DOOR WITH WOOD VENEER (RE: SPECS.)

D2: PAINTED 16 GA. HOLLOW METAL DOOR (RE: SPECS.)

D1: SOLID CORE WOOD DOOR WITH WOOD VENEER (RE: SPECS.)

**DOOR & FRAME TYPES** 1/4" = 1'-0" (1)

**FILE NAME:** C:\@Revit\Locale\Fort Bend County Justice Center\FBC_ARCH_R23.rvt
**DATE STAMP:** 10/17/2024 11:34:26 AM

**CLIENT**

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301 JACKSON ST.
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**CONSULTANT**

**REGISTRATION**

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REGISTERED ARCHITECT 'BRET' 'GALLOWAY' 16377 STATE OF TEXAS

10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

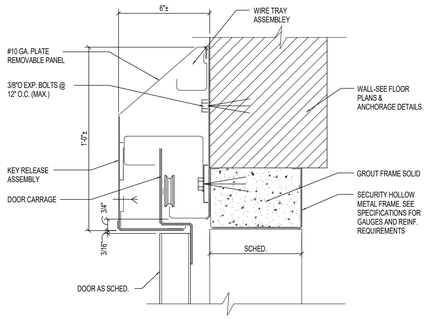
1007828.00

**SHEET TITLE**

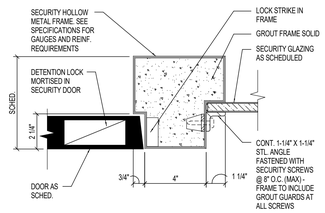
DOOR TYPES & SCHEDULE

**SHEET NUMBER**

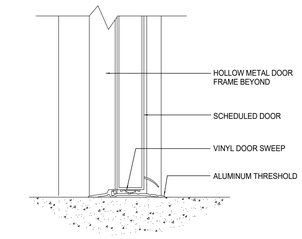
A0.30



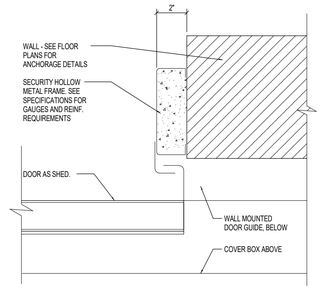

DETAIL - SECURITY DOOR TRACKBOX HEAD 25



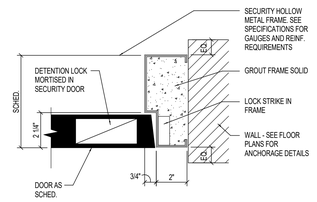

DETAIL - SECURITY DOOR JAMB 20



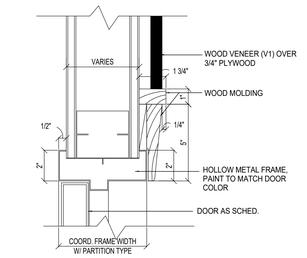

DETAIL - SILL 5



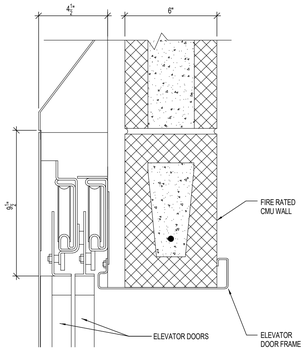

DETAIL - SECURITY DOOR JAMB 24



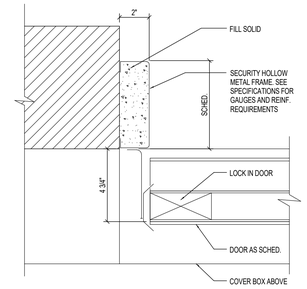

DETAIL - SECURITY DOOR JAMB 19



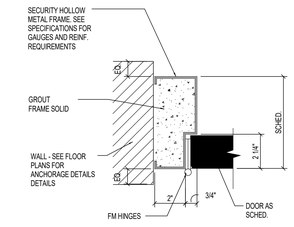

DETAIL - DOOR JAMB 4



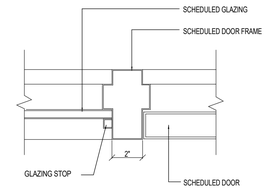

DETAIL - ELEVATOR DOOR HEAD 28



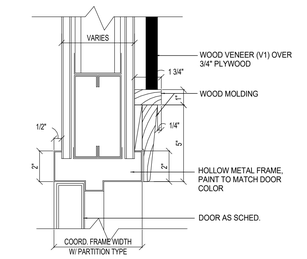

DETAIL - SECURITY DOOR JAMB 23



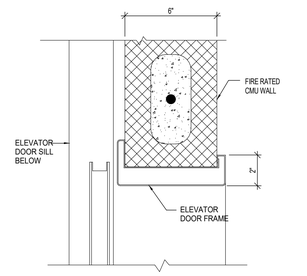

DETAIL - SECURITY DOOR JAMB 18



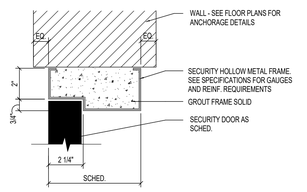

DETAIL - DOOR JAMB 8



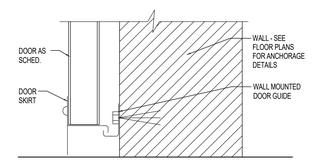

DETAIL - DOOR HEAD 3



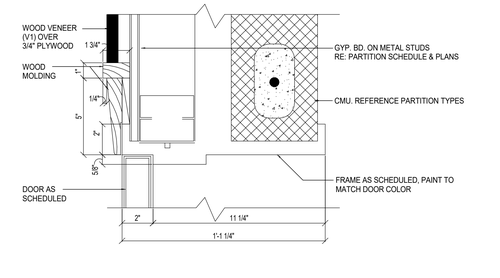

DETAIL - ELEVATOR DOOR JAMB 27



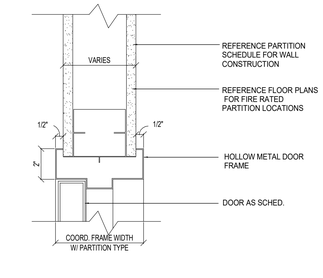

DETAIL - SECURITY DOOR HEAD 22



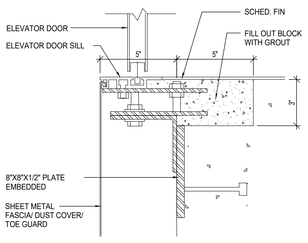

DETAIL - SECURITY DOOR GUIDE 17



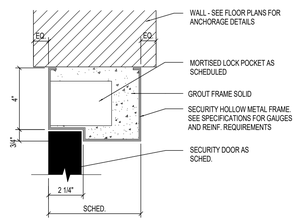

DETAIL - DOOR JAMB 7



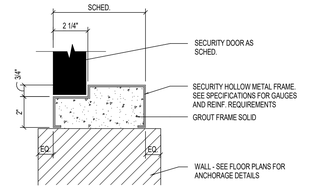

DETAIL - DOOR JAMB 2



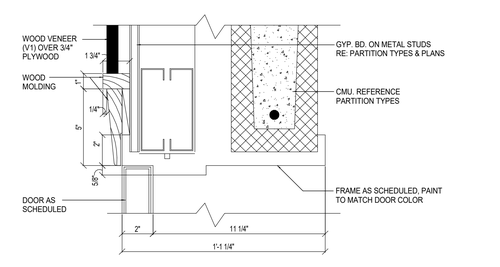

DETAIL - ELEVATOR DOOR SILL 26



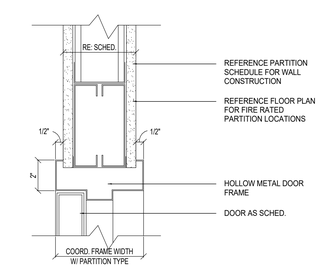

DETAIL - SECURITY DOOR HEAD 21




DETAIL - SECURITY DOOR SILL 16




DETAIL - DOOR HEAD 6




DETAIL - DOOR HEAD 1

FILE NAME: C:\@Revit\Locals\Fort Bond County Justice Center\FBC_ARCH_R23.rvt
DATE STAMP: 10/17/2024 10:57:28 AM


**CLIENT**

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**CONSULTANT**



**REGISTRATION**

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REGISTERED ARCHITECT 63772 STATE OF TEXAS

10/17/2024


**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

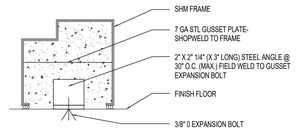
1007828.00

**SHEET TITLE**

DOOR DETAILS

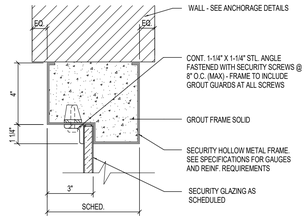
**SHEET NUMBER**

A0.31

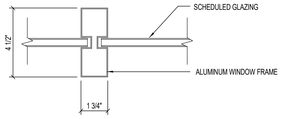



DETAIL - TYPICAL SECURITY FRAMES (15)

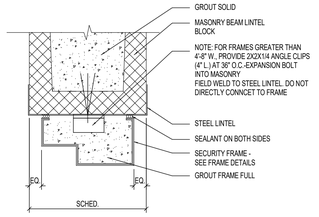
(FOR FRAMES OVER 6'-0")



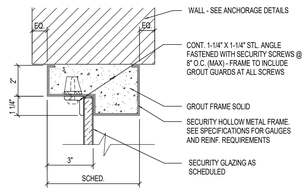

DETAIL - SECURITY DOOR HEAD (10)



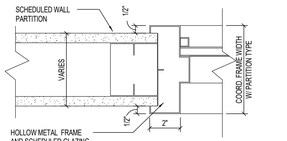

DETAIL - VERTICAL MULLION (5)



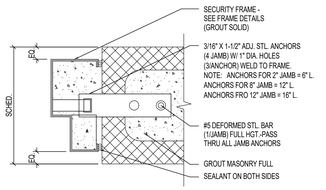

DETAIL - ANCHOR M-1 JAMB (14)



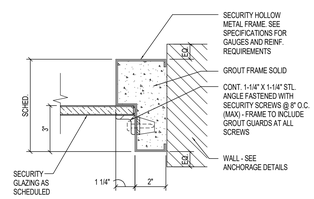

DETAIL - SECURITY DOOR HEAD (9)



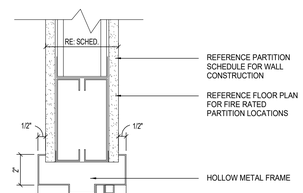

DETAIL - WINDOW JAMB (4)



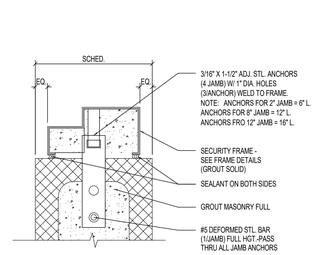

DETAIL - ANCHOR M-1 JAMB (13)



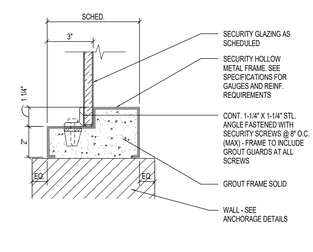

DETAIL - SECURITY WINDOW JAMB (8)



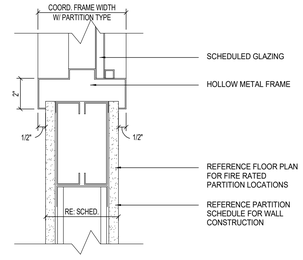

DETAIL - WINDOW HEAD (3)



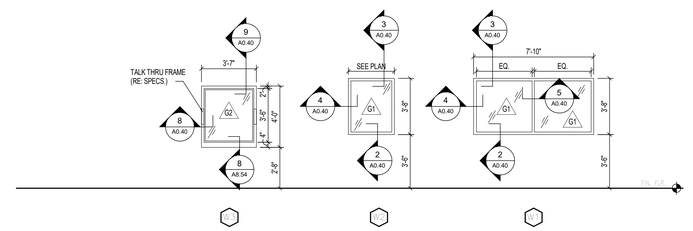

DETAIL - ANCHOR M-1 SILL (12)




DETAIL - SECURITY WINDOW SILL (7)




DETAIL - WINDOW SILL (2)




**WINDOW TYPES** 1/4" = 1'-0" (1)

**FILE NAME:** C:\@Revit Locals\Fort Bend County Justice Center\FBC_ARCH_R23.rvt
**DATE STAMP:** 10/17/2024 10:57:28 AM

**CLIENT**

**FORT BEND COUNTY**

301 JACKSON ST.
RICHMOND, TX 77469
T 281-342-3411

**ARCHITECT**

PGAL

PGAL, Inc.
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Suite 200
Houston, TX 77042
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**CONSULTANT**

**REGISTRATION**

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REGISTERED ARCHITECT 16372 STATE OF TEXAS

10/17/2024

**DRAWING HISTORY**

| No | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

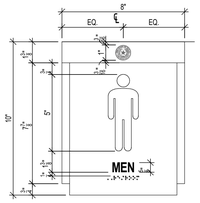
**PROJECT NUMBER**
1007828.00

**SHEET TITLE**
WINDOW TYPES & DETAILS

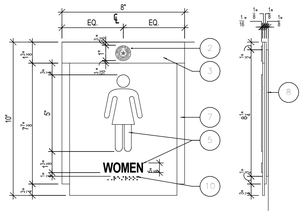
**SHEET NUMBER**
A0.40

# GRAPHIC DESIGN AND MESSAGES

| SIGN NO. | SPACE NAME | SIGN DESIGN | TEXT | ROOM NO. ON SIGN | NOTES |
|---|---|---|---|---|---|
| 10194 | KITCHEN/BREAK | A3B | KITCHEN/BREAK | 10194 | - - |
| 10204A | VESTIBULE | A12 | - - | 10210 | CLIENT TO PROVIDE COURTROOM NAME |
| 10204B | VESTIBULE | A5 | - - | - - | CLIENT TO PROVIDE COURTROOM NAME |
| 10206 | TRIAL READY | A3B | ATTORNEY/CLIENT CONFERENCE | 10206 | - - |
| 10208 | TRIAL READY | A3B | ATTORNEY/CLIENT CONFERENCE | 10208 | - - |
| 10210A | COURT ROOM | A3D | CLERK ACCESS | 10210 | CLIENT TO PROVIDE COURTROOM NAME |
| 10210B | COURT ROOM | A3D | JURY ACCESS | 10210 | CLIENT TO PROVIDE COURTROOM NAME |
| 10210C | COURT ROOM | A7 | - - | - - | CLIENT TO PROVIDE COURTROOM/JUDGE NAME |
| 10210D | COURT ROOM | A2 | MAXIMUM OCCUPANCY 121 | - - | - - |
| 10216A | PREP. | A3A | AUTHORIZED PERSONNEL ONLY | 10216 | - - |
| 10216B | PREP. | A1 | - - | - - | - - |
| 10218 | A/V | A3B | A/V ROOM | 10218 | - - |
| 10219 | OPEN SPACE | - - | - - | 10219 | CLIENT TO PROVIDE ROOM NAME, CONTRACTOR MATCH MAIN CORRIDOR SIGNAGE |
| 10226 | ATTY CONF | A3A | ATTORNEY/CLIENT CONFERENCE | 10226 | - - |
| 10230A | VESTIBULE | A4A | - - | 10244 | CLIENT TO PROVIDE COURTROOM NAME |
| 10230B | VESTIBULE | A4A | - - | 10210 | CLIENT TO PROVIDE COURTROOM NAME |
| 10232A | HOLDING | A9 | - - | - - | - - |
| 10232B | HOLDING | A11 | 1 | - - | - - |
| 10234 | CELL | A13 | - - | - - | CLIENT TO PROVIDE CELL NUMBERING |
| 10236 | CELL | A13 | - - | - - | CLIENT TO PROVIDE CELL NUMBERING |
| 10238A | VESTIBULE | A12 | - - | 10244 | CLIENT TO PROVIDE COURTROOM NAME |
| 10238B | VESTIBULE | A5 | - - | - - | CLIENT TO PROVIDE COURTROOM NAME |
| 10240 | TRIAL READY | A3B | ATTORNEY/CLIENT CONFERENCE | 10240 | - - |
| 10242 | TRIAL READY | A3B | ATTORNEY/CLIENT CONFERENCE | 10242 | - - |
| 10244A | COURT ROOM | A3D | CLERK ACCESS | 10244 | CLIENT TO PROVIDE COURTROOM NAME |
| 10244B | COURT ROOM | A3D | JURY ACCESS | 10244 | CLIENT TO PROVIDE COURTROOM NAME |
| 10244C | COURT ROOM | A7 | - - | - - | CLIENT TO PROVIDE COURTROOM/JUDGE NAME |
| 10244D | COURT ROOM | A2 | MAXIMUM OCCUPANCY 121 | - - | - - |
| 10246 | A/V | A3B | A/V ROOM | 10246 | - - |
| 10248A | PREP. | A3A | AUTHORIZED PERSONNEL ONLY | 10248 | - - |
| 10248B | PREP. | A1 | - - | - - | - - |
| 10254 | CORRIDOR | - - | - - | 10254 | CLIENT TO PROVIDE SIGNAGE TEXT, CONTRACTOR TO MATCH MAIN CORRIDOR SIGNAGE |
| 10256B | CORRIDOR | A3A | AUTHORIZED PERSONNEL ONLY | - - | - - |
| 10257 | OPEN SPACE | A3C | - - | 10257 | CLIENT TO PROVIDE ROOM NAME |
| 10258 | STAFF | A6 | JUDGE'S CHAMBERS | 10258 | CLIENT TO PROVIDE ROOM NAME |
| 10260 | WK. ROOM | A3C | WORKROOM | 10260 | - - |
| 10262 | JUDGE'S CHAMBERS | A6 | JUDGE'S CHAMBERS | 10262 | CLIENT TO PROVIDE JUDGE'S NAME |
| 10268 | COURT REPORTER | A8 | - - | 10268 | CLIENT TO PROVIDE NAME/TITLE |
| 10270 | VESTIBULE | A3B | JURY DELIBERATION | 10270 | - - |
| 10272 | MEN | A10B | MEN | - - | - - |
| 10274 | WOMEN | A10A | WOMEN | - - | - - |
| 10278 | OPEN SPACE | A3C | - - | 10278 | - - |
| 10280 | STAFF | A6 | JUDGE'S CHAMBERS | 10280 | CLIENT TO PROVIDE ROOM NAME |
| 10284 | COURT REPORTER | A8 | - - | 10284 | CLIENT TO PROVIDE NAME/TITLE |
| 10286 | JUDGE'S CHAMBERS | A6 | JUDGE'S CHAMBERS | 10286 | CLIENT TO PROVIDE JUDGE'S NAME |
| 10292 | WK. ROOM | A3C | WORKROOM | 10292 | - - |
| 10294 | VEST. | A3B | JURY DELIBERATION | 10294 | - - |
| 10296 | WOMEN | A10A | WOMEN | - - | - - |
| 10298 | MEN | A10B | MEN | - - | - - |
| 10306A | VESTIBULE | A12 | - - | 10312 | CLIENT TO PROVIDE COURTROOM NAME |
| 10306B | VESTIBULE | A5 | - - | - - | CLIENT TO PROVIDE COURTROOM NAME |
| 10308 | TRIAL READY | A3B | ATTORNEY/CLIENT CONFERENCE | 10308 | - - |
| 10310 | TRIAL READY | A3B | ATTORNEY/CLIENT CONFERENCE | 10310 | - - |
| 10312A | COURT ROOM | A3D | CLERK ACCESS | 10312 | CLIENT TO PROVIDE COURTROOM NAME |
| 10312B | COURT ROOM | A3D | JURY ACCESS | 10312 | CLIENT TO PROVIDE COURTROOM NAME |
| 10312C | COURT ROOM | A7 | - - | - - | CLIENT TO PROVIDE COURTROOM/JUDGE NAME |
| 10312D | COURT ROOM | A2 | MAXIMUM OCCUPANCY 121 | - - | - - |
| 10318A | PREP. | A3A | AUTHORIZED PERSONNEL ONLY | 10318 | - - |
| 10318B | PREP. | A1 | - - | - - | - - |
| 10320 | A/V | A3B | A/V ROOM | 10320 | - - |
| 10324 | VESTIBULE | A3B | JURY DELIBERATION | 10324 | - - |
| 10326 | WOMEN | A10A | WOMEN | - - | - - |
| 10330 | MEN | A3B | MEN | - - | - - |
| 10332 | STAFF | A6 | JUDGE'S CHAMBERS | 10332 | CLIENT TO PROVIDE ROOM NAME |
| 10334 | WK. ROOM | A3C | WORKROOM | 10334 | - - |
| 10336 | JUDGE'S CHAMBERS | A6 | JUDGE'S CHAMBERS | 10336 | CLIENT TO PROVIDE JUDGE'S NAME |
| 10342 | COURT REPORTER | A8 | - - | 10342 | CLIENT TO PROVIDE NAME/TITLE |
| 10502 | VESTIBULE | A4A | - - | 10312 | CLIENT TO PROVIDE COURTROOM NAME |



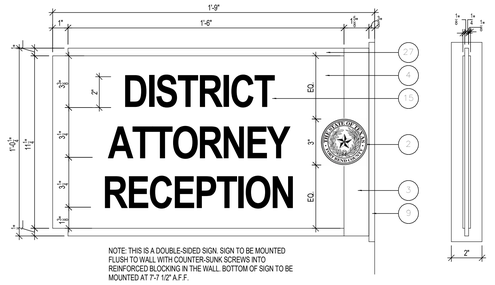

B. FRONT VIEW




A. FRONT VIEW SIDE VIEW

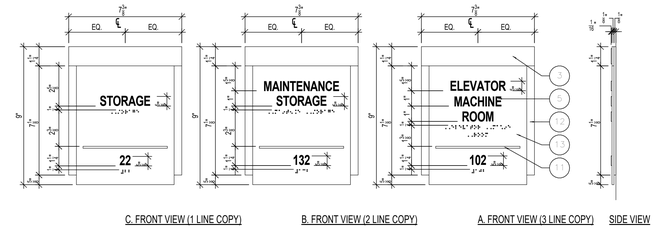
NOTE: SIGN TO BE MOUNTED FLUSH TO WALL WITH THIN MIL VHB DOUBLE-STICK TAPE AND SILICONE ADHESIVE. SIGN TO BE MOUNTED AT 5'-0" TO CENTER OF PANEL A.F.F. AND AT 3" FROM THE STRIKE SIDE OF THE DOOR.

## RESTROOM - SIGNAGE (A10) | 3" = 1'-0" | 13




NOTE: THIS IS A DOUBLE-SIDED SIGN. SIGN TO BE MOUNTED FLUSH TO WALL WITH COUNTER-SUNK SCREWS INTO REINFORCED BLOCKING IN THE WALL. BOTTOM OF SIGN TO BE MOUNTED AT 7'-7 1/2" A.F.F.

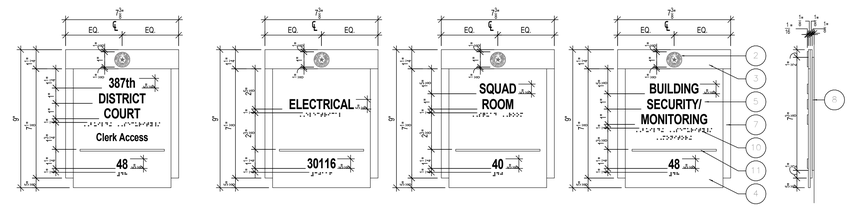
## CANTILEVERED - SIGNAGE (A5) | 3" = 1'-0" | 8




C. FRONT VIEW (1 LINE COPY) B. FRONT VIEW (2 LINE COPY) A. FRONT VIEW (3 LINE COPY) SIDE VIEW

NOTE: SIGN HAS NO MOUNTING BACKPLATE. SIGN TO BE MOUNTED FLUSH TO WALL WITH THIN MIL VHB DOUBLE-STICK TAPE AND SILICONE ADHESIVE. SIGN TO BE MOUNTED AT 5'-0" TO CENTER OF PANEL A.F.F. AND AT 3" FROM THE STRIKE SIDE OF THE DOOR.

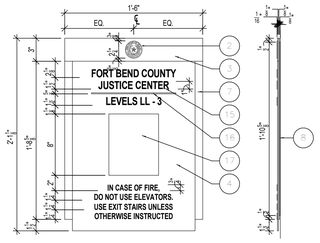
## TYPICAL SECURE ROOM - SIGNAGE (A4) | 3" = 1'-0" | 4




D. FRONT VIEW (4 LINE COPY) C. FRONT VIEW (1 LINE COPY) B. FRONT VIEW (2 LINE COPY) A. FRONT VIEW (3 LINE COPY) SIDE VIEW

NOTE: SIGN TO BE MOUNTED FLUSH TO WALL WITH THIN MIL VHB DOUBLE-STICK TAPE AND SILICONE ADHESIVE. SIGN TO BE MOUNTED AT 5'-0" TO CENTER OF PANEL A.F.F. AND AT 3" FROM THE STRIKE SIDE OF THE DOOR.

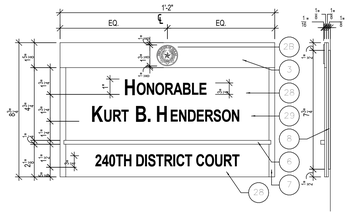
## TYPICAL ROOM / CONFERENCE ROOM - SIGNAGE (A3) | 3" = 1'-0" | 3




FRONT VIEW SIDE VIEW

NOTE: SIGN TO BE MOUNTED FLUSH TO WALL WITH THIN MIL VHB DOUBLE-STICK TAPE AND SILICONE ADHESIVE. SIGN TO BE MOUNTED AT 5'-0" TO CENTER OF PANEL A.F.F. AND CENTERED OVER ELEVATOR CALL BUTTONS.

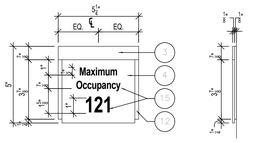
## ELEVATOR CALL BUTTON - SIGNAGE (A9) | 1 1/2" = 1'-0" | 12




FRONT VIEW SIDE VIEW

NOTE: SIGN TO BE MOUNTED FLUSH TO WOOD VENEER WALL WITH THIN MIL VHB DOUBLE-STICK TAPE AND SILICONE ADHESIVE. SIGN TO BE MOUNTED AT 2'-9 1/4" TO CENTER OF PANEL A.F.F.

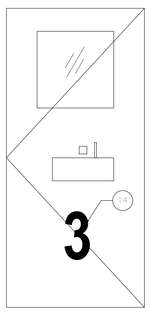
## JUDGE'S NAMEPLATE - SIGNAGE (A7) | 3" = 1'-0" | 7



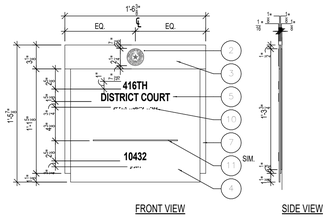

FRONT VIEW SIDE VIEW

NOTE: SIGN HAS NO MOUNTING BACKPLATE. SIGN TO BE MOUNTED FLUSH TO WALL WITH THIN MIL VHB DOUBLE-STICK TAPE AND SILICONE ADHESIVE. SIGN TO BE MOUNTED AT 5'-0" TO CENTER OF PANEL A.F.F. AND AT 3" FROM THE STRIKE SIDE OF THE DOOR.

## MAXIMUM OCCUPANCY - SIGNAGE (A2) | 3" = 1'-0" | 2



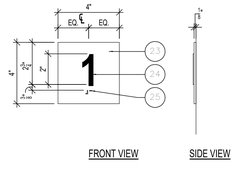

## HOLDING CELL - SIGNAGE (A13) | 3/4" = 1'-0" | 16




FRONT VIEW SIDE VIEW

NOTE: SIGN TO BE MOUNTED FLUSH TO WALL WITH THIN MIL VHB DOUBLE-STICK TAPE AND SILICONE ADHESIVE. SIGN TO BE MOUNTED AT 5'-0" TO CENTER OF PANEL A.F.F. AND AT 3" FROM THE STRIKE SIDE OF DOOR.

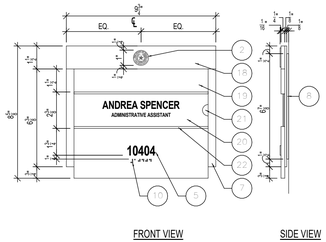
## DEPARTMENT - SIGNAGE (A12) | 1 1/2" = 1'-0" | 15




FRONT VIEW SIDE VIEW

NOTE: SIGN HAS NO MOUNTING BACKPLATE. SIGN TO BE MOUNTED FLUSH TO WALL WITH THIN MIL VHB DOUBLE-STICK TAPE AND SILICONE ADHESIVE. SIGN TO BE MOUNTED AT 5'-0" TO CENTER OF PANEL A.F.F. AND AT 3" FROM THE STRIKE SIDE OF THE DOOR.

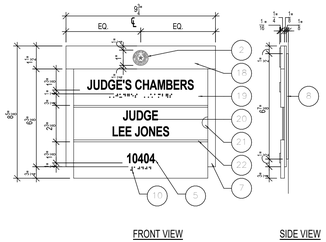
## ELEVATOR JAMB - SIGNAGE (A11) | 3" = 1'-0" | 14




FRONT VIEW SIDE VIEW

NOTE: SIGN TO BE MOUNTED FLUSH TO WALL WITH THIN MIL VHB DOUBLE-STICK TAPE AND SILICONE ADHESIVE. SIGN TO BE MOUNTED AT 5'-0" TO CENTER OF PANEL A.F.F. AND AT 3" FROM THE STRIKE SIDE OF THE DOOR.

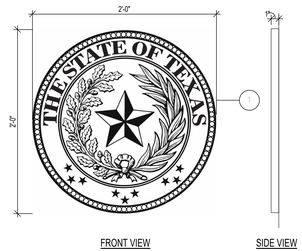
## OFFICE - SIGNAGE (A8) | 3" = 1'-0" | 11




FRONT VIEW SIDE VIEW

NOTE: SIGN TO BE MOUNTED FLUSH TO WALL WITH THIN MIL VHB DOUBLE-STICK TAPE AND SILICONE ADHESIVE. SIGN TO BE MOUNTED AT 5'-0" TO CENTER OF PANEL A.F.F. AND AT 3" FROM THE STRIKE SIDE OF THE DOOR.

## JUDGE'S CHAMBERS - SIGNAGE (A6) | 3" = 1'-0" | 6




FRONT VIEW SIDE VIEW

NOTE: SIGN UNIT TO BE SECURELY FASTENED TO WALL WITH HEAVY DUTY FASTENERS AND SIGNIFICANT REINFORCED BLOCKING IN WALL. SIGNAGE CONTRACTOR TO COORDINATE WITH GENERAL CONTRACTOR TO PROVIDE BLOCKING. SIZE OF MOUNTING PLATES AND SIZE/TYPE OF FASTENER TO BE ENGINEERED BY STRUCTURAL ENGINEER LICENSED WITH THE STATE OF TEXAS TO MEET MAXIMUM LOAD REQUIREMENTS AND DETAILED ON STAMPED SHOP DRAWINGS SUBMITTED BY SIGNAGE CONTRACTOR.

## SEAL - SIGNAGE (A1) | 1 1/2" = 1'-0" | 1

# GENERAL NOTES

1. REFER TO DRAWING SERIES A0.10 FOR PARTITION TYPES.
2. REFER TO DRAWING SERIES A0.20 FOR FINISH SCHEDULES AND MATERIALS.
3. REFER TO DRAWING SERIES A0.40 FOR WINDOW SCHEDULES, TYPES, AND DETAILS.
4. REFER TO DRAWING SERIES A2.00 FOR FLOOR PLANS.
5. REFER TO DRAWING SERIES A4.00 FOR ENLARGED FLOOR PLANS.
6. REFER TO DRAWING SERIES A8.00 FOR INTERIOR ELEVATIONS AND DETAILS.
7. INTERIOR SIGNAGE BASIS OF DESIGN:
   ASI SIGNAGE INTOUCH OR APPROVED EQUAL.
8. WHERE SIGNAGE IS LOCATED ON SCHEDULED GLAZING, PROVIDE A FLAT BACK PANEL OF SAME SIZE, COLOR, AND MATERIAL.
9. ALL EXPOSED SURFACES TO BE PAINTED/SILKSCREENED ARE TO BE FINISHED SMOOTH, PRIMED AND PAINTED WITH AN EGG-SHELL FINISH. ALL EDGES AND CORNERS TO BE SLIGHTLY EASED ON CRISP, CLEAN, 90° RETURNS AND FINISHED SMOOTH.
10. THE SIGNAGE CONTRACTOR IS TO FIELD VERIFY ALL EXISTING CONDITIONS AT EACH LOCATION AND THEN SUBMIT DETAILED SHOP DRAWINGS AND COPY LAYOUT TO GRAPHIC DESIGNER/CLIENT FOR FINAL APPROVAL PRIOR TO FABRICATION.
11. ALL SIGNAGE INSIDE THE COURTROOMS WILL HAVE THE STATE SEAL LOGO.

# KEYED NOTES

1. STATE SEAL TO BE 1" DEEP CAST BRONZE. COPY, WREATH AND STAR TO BE CAST INTEGRAL WITH PANEL. RAISED 1/4" AND HIGHLIGHTED. RECESSED AREAS AROUND RAISED AREAS TO BE STAINED DARKER FOR ANTIQUE LOOK. ARTWORK TO BE PROVIDED IN ELECTRONIC FORMAT BY THE GRAPHIC DESIGNER.
2. COUNTY SEAL TO BE 1/16" THICK ZINC ETCHED AND FINISHED WITH A BRASS OIL RUB ON FACE AND EDGES. PANEL TO BE PERMANENTLY ATTACHED TO HEADER PANEL WITH THIN MIL VHB TAPE AND SILICONE ADHESIVE.

2B. STATE SEAL TO BE 1/16" THICK ZINC ETCHED AND FINISHED WITH A BRASS OIL RUB ON FACE AND EDGES. PANEL TO BE PERMANENTLY ATTACHED TO HEADER PANEL WITH THIN MIL VHB TAPE AND SILICONE ADHESIVE.

3. HEADER PANEL TO BE 1/8" THICK HORIZONTALLY BRUSHED ALUMINUM ON FACE AND EDGES. PANEL TO BE PERMANENTLY ATTACHED TO BACK PANEL WITH THIN MIL VHB TAPE AND SILICONE ADHESIVE. HEADER PANEL TO BE FLUSH WITH FACE PANEL.
4. FACE PANEL TO BE 1/8" THICK ACRYLIC PAINTED TO MATCH P-1 ON FACE AND EDGES. PANEL TO BE PERMANENTLY ATTACHED TO BACK PANEL WITH THIN MIL VHB TAPE AND SILICONE ADHESIVE. FACE PANEL TO BE FLUSH WITH HEADER PANEL.
5. COPY TO BE RAISED 1/32" AND TIP-SCREENED TO MATCH P-2. TYPESTYLE: HELVETICA REGULAR, ALL CAPS.
6. MIDDLE DETAIL TO BE 1/4" X 3/8" THICK POLISHED ALUMINUM ON FACE AND EDGES. PANEL TO BE PERMANENTLY ATTACHED TO BACK PANEL WITH THIN MIL VHB TAPE AND SILICONE ADHESIVE.
7. BACK PANEL TO BE 1/8" BRUSHED ALUMINUM ON FACE AND EDGES. PANEL TO BE PERMANENTLY ATTACHED TO MOUNTING BACKPLATE WITH THIN MIL VHB TAPE AND SILICONE ADHESIVE.
8. MOUNTING BACKPLATE TO BE 1/8" THICK BLACK ACRYLIC WITH FINISHED EDGES. MOUNTING PLATE TO BE MOUNTED FLUSH TO WALL WITH COUNTER-SUNK SCREWS AND WALL ANCHORS.
9. MOUNTING PLATE TO BE 3/8" THICK TO MATCH M-2 ON FACE AND EDGES. MOUNTING PLATE TO BE MOUNTED FLUSH TO BACK PANEL WITH NO EXPOSED FASTENERS.
10. GRADE 2 BRAILLE TO BE RAISED 1/32", TIPPED TO ACHIEVE A DOMED SURFACE, AND PAINTED TO MATCH BACKGROUND. TYPESTYLE: HELVETICA REGULAR, ALL CAPS.
11. LINE DETAIL TO BE 1/8" THICK APPLIED VINYL TO MATCH P-2, LINE TO BE 5-1/2" IN LENGTH.
12. BACK PANEL TO BE 1/8" THICK ACRYLIC PAINTED TO MATCH P-3 ON FACE AND EDGES. PANEL TO BE PERMANENTLY ATTACHED TO MOUNTING BACKPLATE WITH THIN MIL VHB TAPE AND SILICONE ADHESIVE.
13. FACE PANEL TO BE 1/8" THICK EXTERIOR GRADE PHOTOPOLYMER PLATE WITH RAISED COPY AND GRADE 2 BRAILLE. PAINTED TO MATCH P-1 ON FACE AND EDGES. PANEL TO BE PERMANENTLY ATTACHED TO BACK PANEL WITH THIN MIL VHB TAPE AND SILICONE ADHESIVE. FACE PANEL TO BE FLUSH WITH HEADER PANEL.
14. LETTERFORM GRAPHIC TO BE PAINTED TO MATCH P-4. TYPESTYLE: HELVETICA BOLD, ALL CAP. ARTWORK/LAYOUTS TO BE PROVIDED IN ELECTRONIC FORMAT BY THE GRAPHIC DESIGNER.
15. COPY TO THE FIRST SURFACE SILKSCREENED TO MATCH P-2. TYPESTYLE: HELVETICA REGULAR, ALL CAPS.
16. COPY TO THE FIRST SURFACE SILKSCREENED TO MATCH P-2.
17. EGRESS MAP TO BE FIRST SURFACE SILKSCREENED TO MATCH TWO COLORS. ALL WALLS AND OUTLINES TO MATCH P-2. EGRESS ROUTE TO MATCH P-6. EGRESS ARTWORK TO BE PREPARED BY THE SIGNAGE CONTRACTOR BASED ON ONE "GO BY" PROVIDED BY THE GRAPHIC DESIGNER. NOTE: EGRESS MAPS TO HAVE MINIMUM OF TWO SEPARATE ROUTES FROM ELEVATORS TO EXITS, INDICATE STAIR IDENTITIES AND BE ORIENTED TO VIEWERS.
18. HEADER PANEL TO BE 1/4" THICK HORIZONTALLY BRUSHED ALUMINUM ON FACE AND EDGES. PANEL TO BE PERMANENTLY ATTACHED TO BACK PANEL WITH THIN MIL VHB TAPE AND SILICONE ADHESIVE. HEADER PANEL TO BE FLUSH WITH FACE PANEL.
19. FACE PANEL TO BE 1/4" THICK ACRYLIC PAINTED TO MATCH P-1 ON FACE AND EDGES. PANEL TO BE PERMANENTLY ATTACHED TO BACK PANEL WITH THIN MIL VHB TAPE AND SILICONE ADHESIVE. FACE PANEL TO BE FLUSH WITH HEADER PANEL.
20. INSERTS TO BE CLEAR ACETATE WITH LASER PRINTED NAME/TITLE. SIGNAGE CONTRACTOR TO FURNISH INITIAL INSTALLATION OF PRINTED INSERTS. NAMES WILL BE AVAILABLE AT THE TIME OF FABRICATION. FOR SIGNS WITHOUT NAMES THE SIGNAGE CONTRACTOR WILL SUPPLY 100CT 8.5X11 SHEET OF CLEAR ACETATE FOR CLIENT.
21. THUMB CUT-OUT WILL BE 3/4" DIAMETER TO FACILITATE REPLACING THE ACETATE INSERTS. ALL EDGES WILL BE SANDED SMOOTH PRIOR TO PAINTING.
22. SPACERS ARE 1/16" THICK CLEAR ACRYLIC AND GLUED TO BACK PANEL TO ACCOMMODATE "CLEAR ACETATE" LASER PRINTED INSERTS WITH NAME/TITLE. USE CONTINUOUS CLEAR ADHESIVE. NO AIR BUBBLES OR VISIBLE ADHESIVE ON EDGES OR OTHER ADHESIVE INCONSISTENCIES. SPACERS WILL BE PAINTED TO MATCH P-1 WITH AN EGG-SHELL FINISH.
23. FACE PANEL TO BE 1/8" THICK STAINLESS STEEL TO MATCH M-1, US#4 HORIZONTALLY BRUSHED FINISH ON FACE AND EDGES.
24. NUMERALS TO BE RAISED P-5, 1/32" THICK ROWMARK CUT OUT LETTER FORMS PERMANENTLY ATTACHED TO FACE. TYPESTYLE: HELVETICA REGULAR, ALL CAPS.
25. GRADE 2 BRAILLE TO BE INDIVIDUAL STAINLESS STEEL BEADS PERMANENTLY INSET INTO MACHINED RECESSES ON THE FACE PANEL.
26. STATE SEAL TO BE APPLIED VINYL TO MATCH V-1.
27. MIDDLE PANEL TO BE 1/4" THICK BRUSHED ALUMINUM OF FACE AND EDGES. PANEL TO BE PERMANENTLY WELDED TO MOUNTING PLATE.
28. BACK PANEL TO BE 1/8" THICK ACRYLIC PAINTED TO MATCH P-1 ON FACE AND EDGES. PANEL TO BE REMOVABLE TO BACK PANEL WITH 1/32" MAGNET ON THE BACK OF THE FACE PANEL. 1/32" STEEL ATTACHED TO THE FRONT OF THE BACK PANEL, SO MAGNET WILL STICK AND STAY IN PLACE.
29. COPY TO BE SILKSCREENED TO MATCH P-2. TYPESTYLE: HELVETICA BOLD, ALL CAPS.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REGISTERED ARCHITECT — 23375 — STATE OF TEXAS

10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

1007828.00

**SHEET TITLE**

SIGNAGE TYPES

**SHEET NUMBER**

A0.50

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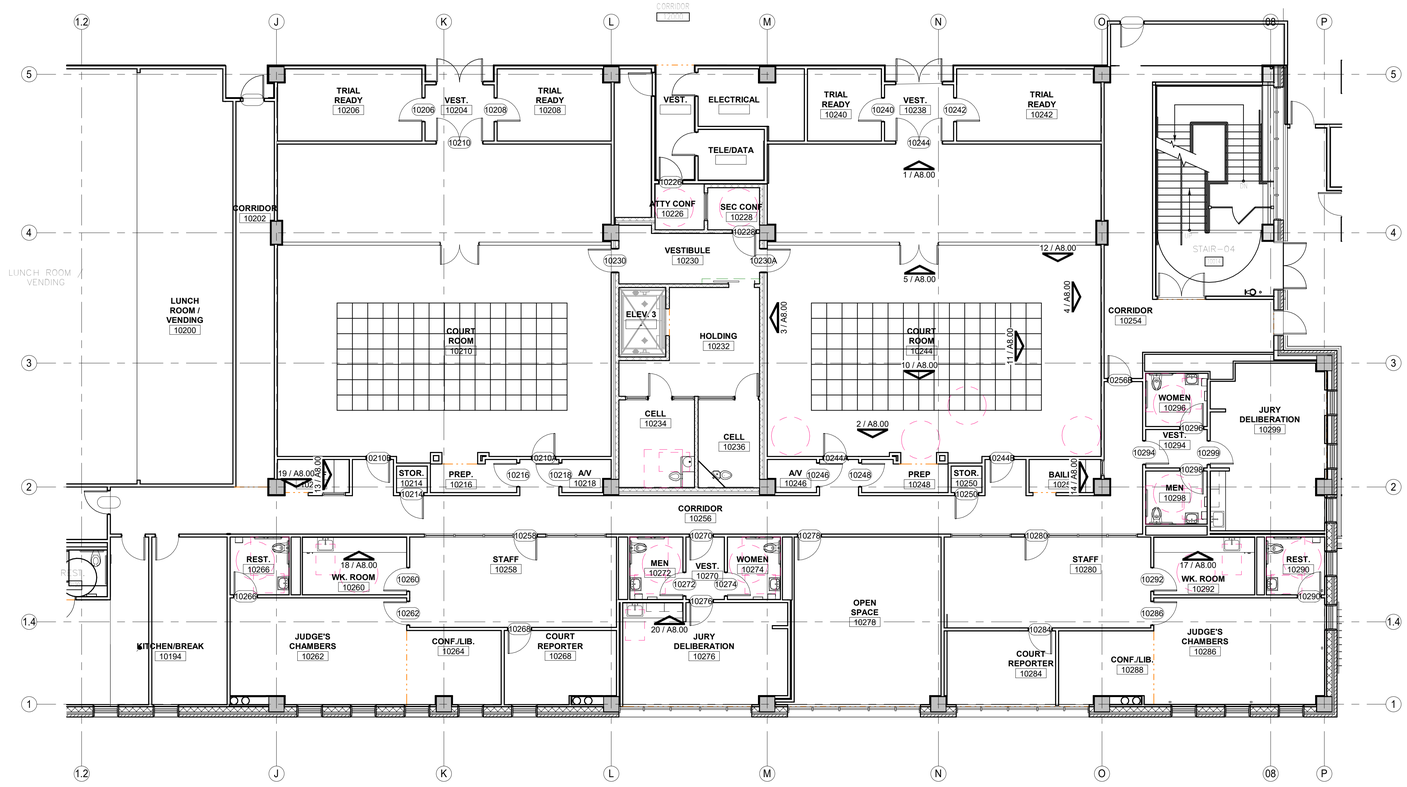
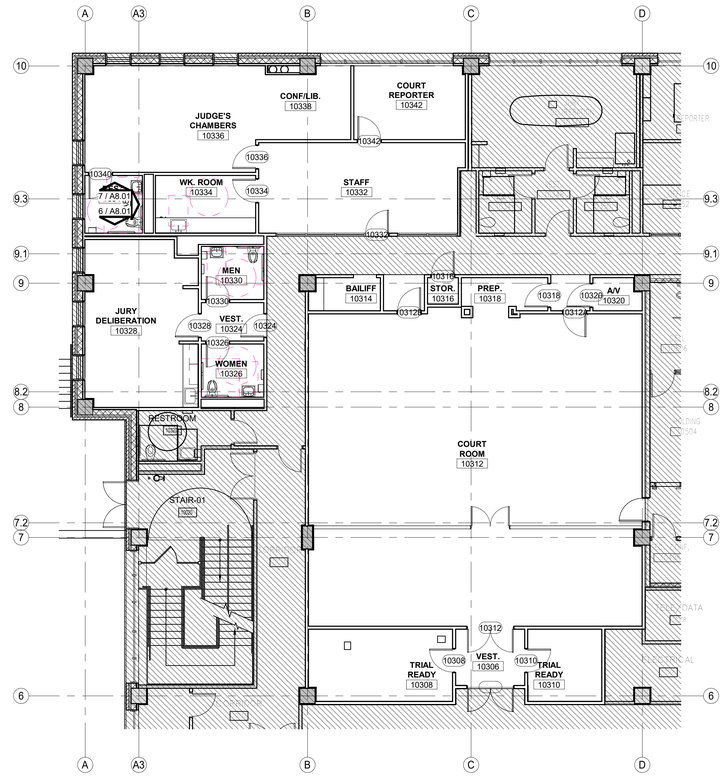



## LEVEL 1 PARTIAL FLOOR PLAN B - SIGNAGE 1/8" = 1'-0" 2




## LEVEL 1 PARTIAL FLOOR PLAN A - SIGNAGE 1/8" = 1'-0" 1

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10/17/2024

**DRAWING HISTORY**

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**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

1007828.00

**SHEET TITLE**

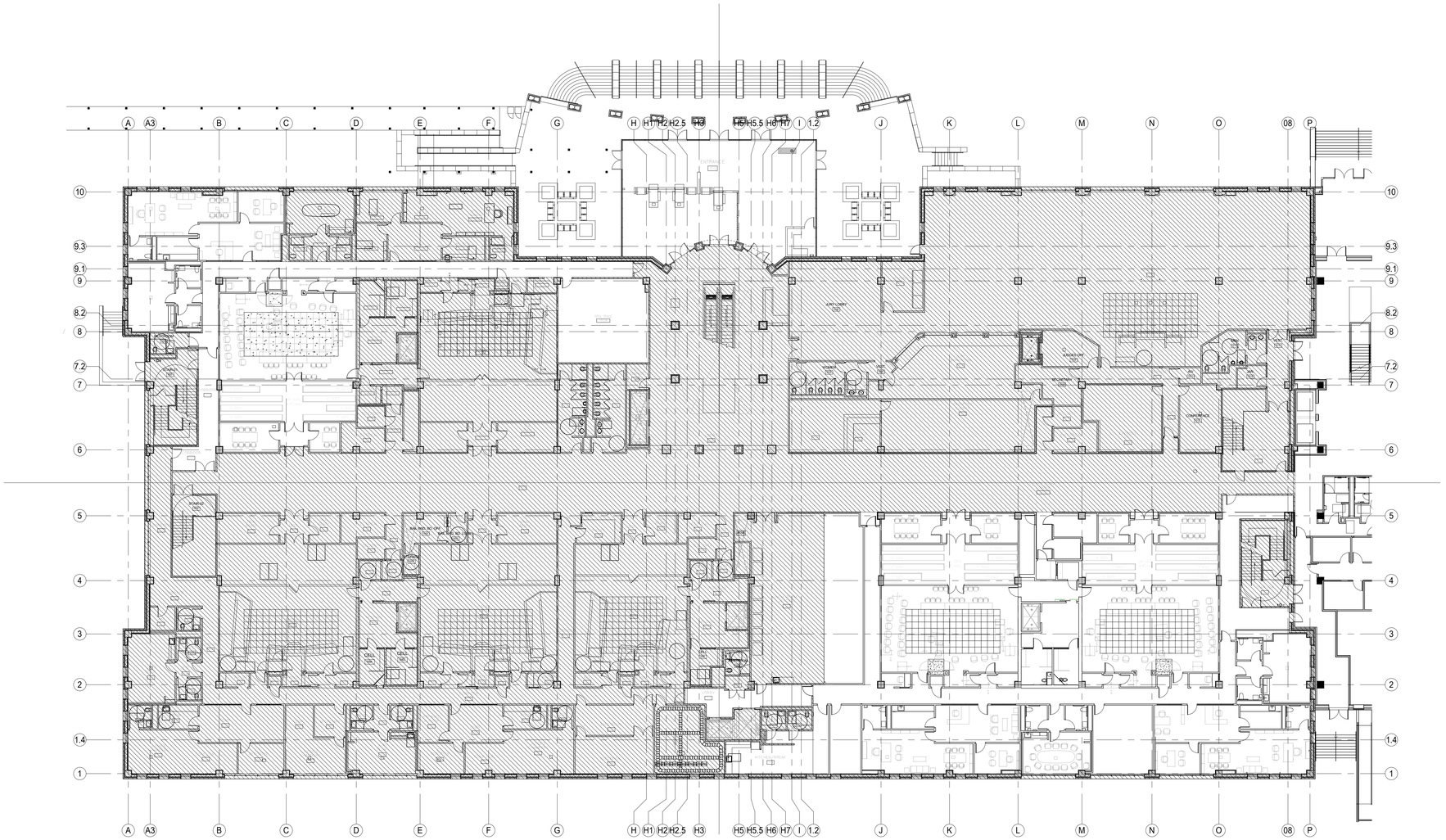
LEVEL 1 SIGNAGE PLAN

**SHEET NUMBER**

A0.55

# GENERAL PLAN NOTES

1. REFER TO DRAWING G0.02 FOR ADA STANDARD DETAILS.
2. REFER TO DRAWING G0.02 FOR TYPICAL MOUNTING HEIGHTS.
3. REFER TO DRAWING G0.03 FOR PROJECT INFORMATION.
4. REFER TO DRAWING SERIES A0.10 FOR PARTITION TYPES.
5. REFER TO DRAWING SERIES A0.20 FOR FINISH SCHEDULES AND MATERIALS.
6. REFER TO DRAWING SERIES A0.30 FOR DOOR SCHEDULES, TYPES AND DETAILS.
7. REFER TO DRAWING SERIES A0.40 FOR WINDOW SCHEDULES, TYPES, AND DETAILS.
8. REFER TO DRAWING SERIES A0.50 FOR SIGNAGE SCHEDULES AND TYPES.
9. REFER TO DRAWING SERIES A1.00 FOR SITE PLANS AND SITE DETAILS.
10. REFER TO DRAWING SERIES A2.00 FOR FLOOR PLANS.
11. REFER TO DRAWING SERIES A3.00 FOR REFLECTED CEILING PLANS.
12. REFER TO DRAWING SERIES A4.00 FOR ENLARGED FLOOR PLANS.
13. REFER TO DRAWING SERIES A8.00 FOR INTERIOR ELEVATIONS AND DETAILS.
14. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
15. ALL DIMENSIONS ARE TO FACE OF GYP BD, CMU OR CENTERLINE OF COLUMN U.N.O. FINISHES (TILE, STONE PANELS, ETC) ARE BEYOND LINE OF INDICATED DIMENSIONS.
16. REFER TO ARCHITECTURAL ELEVATIONS, DETAILS AND SPECIFICATIONS FOR WALL FINISHES, LOCATION AND ARRANGEMENT.
17. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR ALL FLOOR OPENINGS AND DEPRESSIONS, WALL FRAMING, SUSPENSION SYSTEMS, ETC. TO APPLY MATERIAL FINISHES CALLED FOR IN SCHEDULE OR DETAILS.
18. COORDINATE SIZE AND LOCATION OF ALL FLOOR OPENINGS WITH EQUIPMENT MANUFACTURER REQUIREMENTS.
19. REFER TO ARCHITECTURAL INTERIOR ELEVATIONS AND REFLECTED CEILING PLANS FOR CEILING HEIGHTS AND FINISHES.
20. PROVIDE TREATED WOOD BLOCKING AT ALL MILLWORK & TOILET ACCESSORIES AS REQUIRED.
21. **CONTRACTOR TO CONFIRM LOCATIONS OF POST-TENSIONED GIRDERS BEFORE DRILLING OR PENETRATING THE FLOOR SLAB.**
22. ROOM AND DOOR REFERENCE NUMBERS ARE FOR CONSTRUCTION COORDINATION ONLY. CONTRACTOR SHALL COORDINATE WITH OWNER FOR FINAL ROOM & DOOR IDENTIFICATION.
23. DO NOT SCALE DIMENSIONS FROM DRAWINGS, ANY UNKNOWN DIMENSION SHALL BE OBTAINED FROM DESIGN PROFESSIONALS VIA REQUEST FOR INFORMATION (RFI).
24. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
25. CONTRACTOR SHALL NOTIFY ARCHITECT OF ANY DISCREPANCY, INACCURACY OR CONFLICTING INFORMATION BEFORE EXECUTION OF WORK.
26. CONTRACTOR SHALL FIELD COORDINATE LOCATION, SIZE AND TYPE OF BLOCKING FOR INSTALLATION OF SIGNAGE, PLUMBING FIXTURES, MILLWORK, ETC. ALL CONCEALED WOOD SHALL BE FIRE RETARDANT TREATED (F.R.T).
27. PROVIDE IN-WALL REINFORCEMENT FOR ALL WALL MOUNTED FURNITURE AND EQUIPMENT AS REQUIRED.
28. PROVIDE EPOXY SECURITY SEALANT IN HOLDING AREAS, DYNAPOXY EP-1200.




## LEVEL 1 OVERALL FLOOR PLAN

1/16" = 1'-0" (1)

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10/17/2024

**DRAWING HISTORY**

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| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

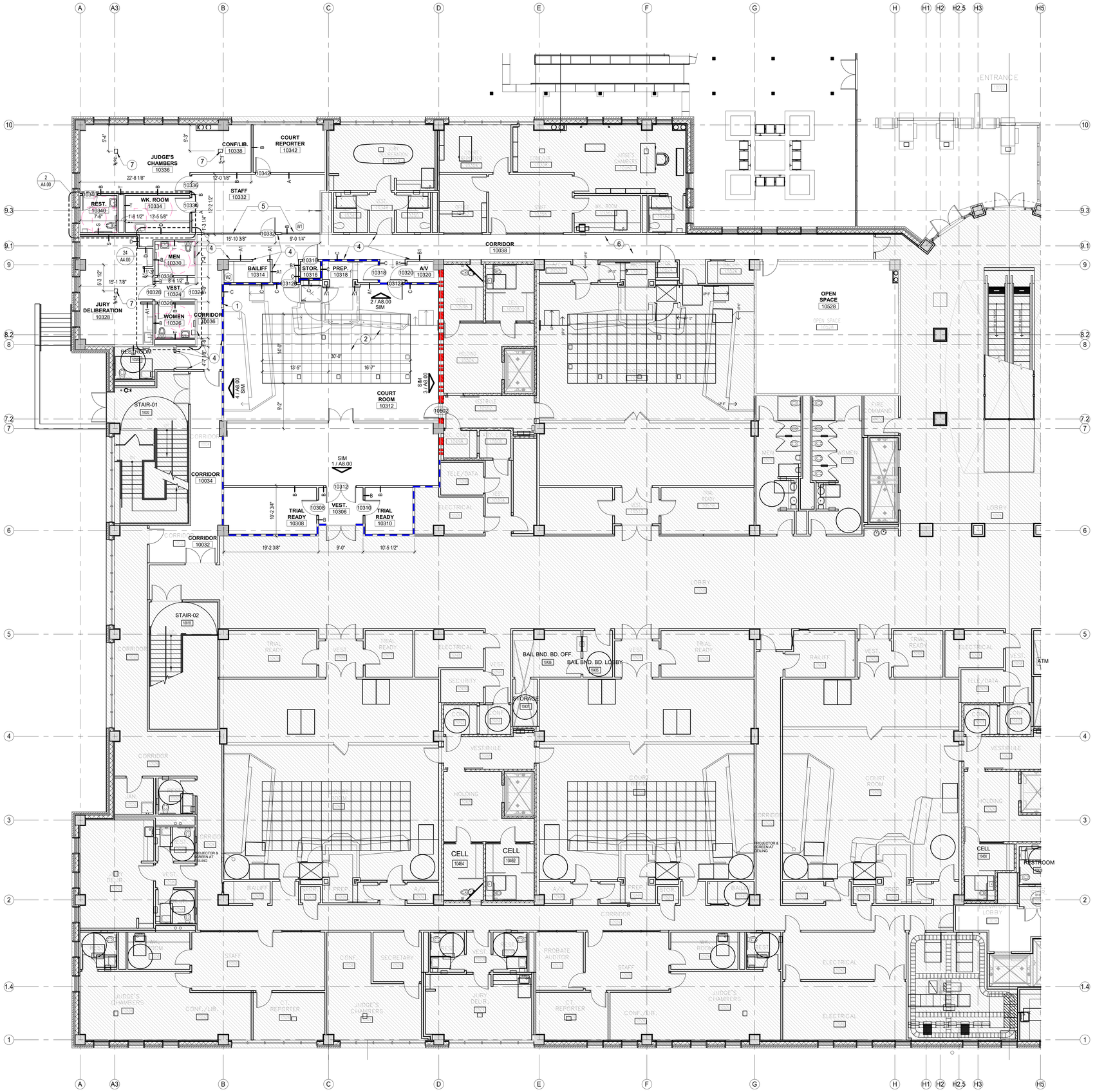
1007828.00

**SHEET TITLE**

LEVEL 1 OVERALL FLOOR PLAN

**SHEET NUMBER**

A2.10




# GENERAL PLAN NOTES

1. REFER TO DRAWING G0.02 FOR ADA STANDARD DETAILS.
2. REFER TO DRAWING G0.02 FOR TYPICAL MOUNTING HEIGHTS.
3. REFER TO DRAWING G0.03 FOR PROJECT INFORMATION.
4. REFER TO DRAWING SERIES A0.10 FOR PARTITION TYPES.
5. REFER TO DRAWING SERIES A0.20 FOR FINISH SCHEDULES AND MATERIALS.
6. REFER TO DRAWING SERIES A0.30 FOR DOOR SCHEDULES, TYPES AND DETAILS.
7. REFER TO DRAWING SERIES A0.40 FOR WINDOW SCHEDULES, TYPES, AND DETAILS.
8. REFER TO DRAWING SERIES A0.50 FOR SIGNAGE SCHEDULES AND TYPES.
9. REFER TO DRAWING SERIES A1.00 FOR SITE PLANS AND SITE DETAILS.
10. REFER TO DRAWING SERIES A2.00 FOR FLOOR PLANS.
11. REFER TO DRAWING SERIES A3.00 FOR REFLECTED CEILING PLANS.
12. REFER TO DRAWING SERIES A4.00 FOR ENLARGED FLOOR PLANS.
13. REFER TO DRAWING SERIES A8.00 FOR INTERIOR ELEVATIONS AND DETAILS.
14. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
15. ALL DIMENSIONS ARE TO FACE OF CYP BD, CMU OR CENTERLINE OF COLUMN U.N.O. FINISHES (TILE, STONE PANELS, ETC) ARE BEYOND LINE OF INDICATED DIMENSIONS.
16. REFER TO ARCHITECTURAL ELEVATIONS, DETAILS AND SPECIFICATIONS FOR WALL FINISHES, LOCATION AND ARRANGEMENT.
17. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR ALL FLOOR OPENINGS AND DEPRESSIONS, WALL FRAMING, SUSPENSION SYSTEMS, ETC. TO APPLY MATERIAL FINISHES CALLED FOR IN SCHEDULE OR DETAILS.
18. COORDINATE SIZE AND LOCATION OF ALL FLOOR OPENINGS WITH EQUIPMENT MANUFACTURER REQUIREMENTS.
19. REFER TO ARCHITECTURAL INTERIOR ELEVATIONS AND REFLECTED CEILING PLANS FOR CEILING HEIGHTS AND FINISHES.
20. PROVIDE TREATED WOOD BLOCKING AT ALL MILLWORK & TOILET ACCESSORIES AS REQUIRED.
21. **CONTRACTOR TO CONFIRM LOCATIONS OF POST-TENSIONED GIRDERS BEFORE DRILLING OR PENETRATING THE FLOOR SLAB.**
22. ROOM AND DOOR REFERENCE NUMBERS ARE FOR CONSTRUCTION COORDINATION ONLY. CONTRACTOR SHALL COORDINATE WITH OWNER FOR FINAL ROOM & DOOR IDENTIFICATION.
23. DO NOT SCALE DIMENSIONS FROM DRAWINGS, ANY UNKNOWN DIMENSION SHALL BE OBTAINED FROM DESIGN PROFESSIONALS VIA REQUEST FOR INFORMATION (RFI).
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27. PROVIDE IN-WALL REINFORCEMENT FOR ALL WALL MOUNTED FURNITURE AND EQUIPMENT AS REQUIRED.
28. PROVIDE EPOXY SECURITY SEALANT IN HOLDING AREAS, DYNAPOXY EP-1200.

# KEYED NOTES

1. RECESSED FIRE EXTINGUISHER CABINET
2. ACCESS FLOOR, RE: 27/A8.52 RE: ELECTRICAL, TELECOMMUNICATIONS AND AUDIO VISUAL DRAWINGS FOR FLOOR BOXES.
3. SAW-CUT ROUGH OPENING ON THE EXISTING CMU SHAFT WALL FOR NEW ELEVATOR DOOR AND FRAME. GROUT CMU SOLID AT JAMBS AND HEAD.
4. INSTALL NEW CONTINUOUS CHAIR RAIL ON BOTH SIDES, RE: 10/A8.53
5. HORIZONTAL BALI CLASSICS MINI BLINDS (RE: SPECS)
6. EXISTING CARPET TO DE DEMOLISHED AND REPLACED WITH NEW CARPET (F2)
7. NEW FLOOR POKE THRU DEVIDE, RE: EKECTRICAL. CONFIMR LOCATION OF REINFORCEMENT/STRUCTURE BELWO PRIOR TO CORE DRILLING.
8. NEW WHEELCHAIR LIFT, RE: SPECS

**LEVEL 1 PARTIAL FLOOR PLAN A** 1/8" = 1'-0" (1)

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10/17/2024

**DRAWING HISTORY**

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**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX
77469

**PROJECT NUMBER**

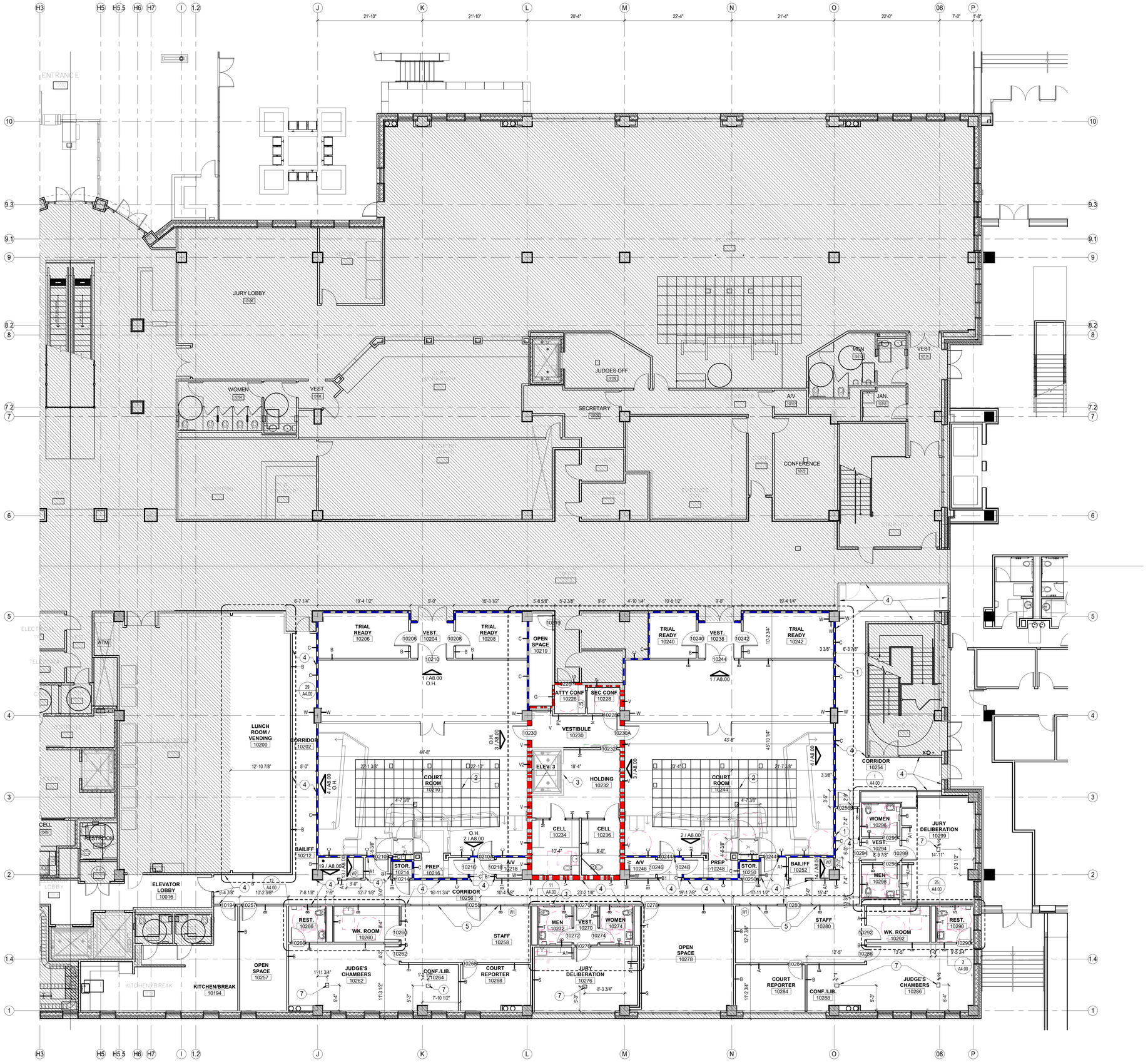
1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL FLOOR PLAN A

**SHEET NUMBER**

A2.11




LEVEL 1 PARTIAL FLOOR PLAN B 1/8" = 1'-0" (1)

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27. PROVIDE IN-WALL REINFORCEMENT FOR ALL WALL MOUNTED FURNITURE AND EQUIPMENT AS REQUIRED.
28. PROVIDE EPOXY SECURITY SEALANT IN HOLDING AREAS, DYNAPOXY EP-1200.

# KEYED NOTES

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2. ACCESS FLOOR, RE: 27/A8.52 RE: ELECTRICAL, TELECOMMUNICATIONS AND AUDIO VISUAL DRAWINGS FOR FLOOR BOXES.
3. SAW-CUT ROUGH OPENING ON THE EXISTING CMU SHAFT WALL FOR NEW ELEVATOR DOOR AND FRAME. GROUT CMU SOLID AT JAMBS AND HEAD.
4. INSTALL NEW CONTINUOUS CHAIR RAIL ON BOTH SIDES, RE: 10/A8.53
5. HORIZONTAL BALI CLASSICS MINI BLINDS (RE: SPECS)
6. EXISTING CARPET TO DE DEMOLISHED AND REPLACED WITH NEW CARPET (F2)
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**CLIENT**

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REGISTERED ARCHITECT 16372 STATE OF TEXAS

10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX
77469

**PROJECT NUMBER**

1007828.00

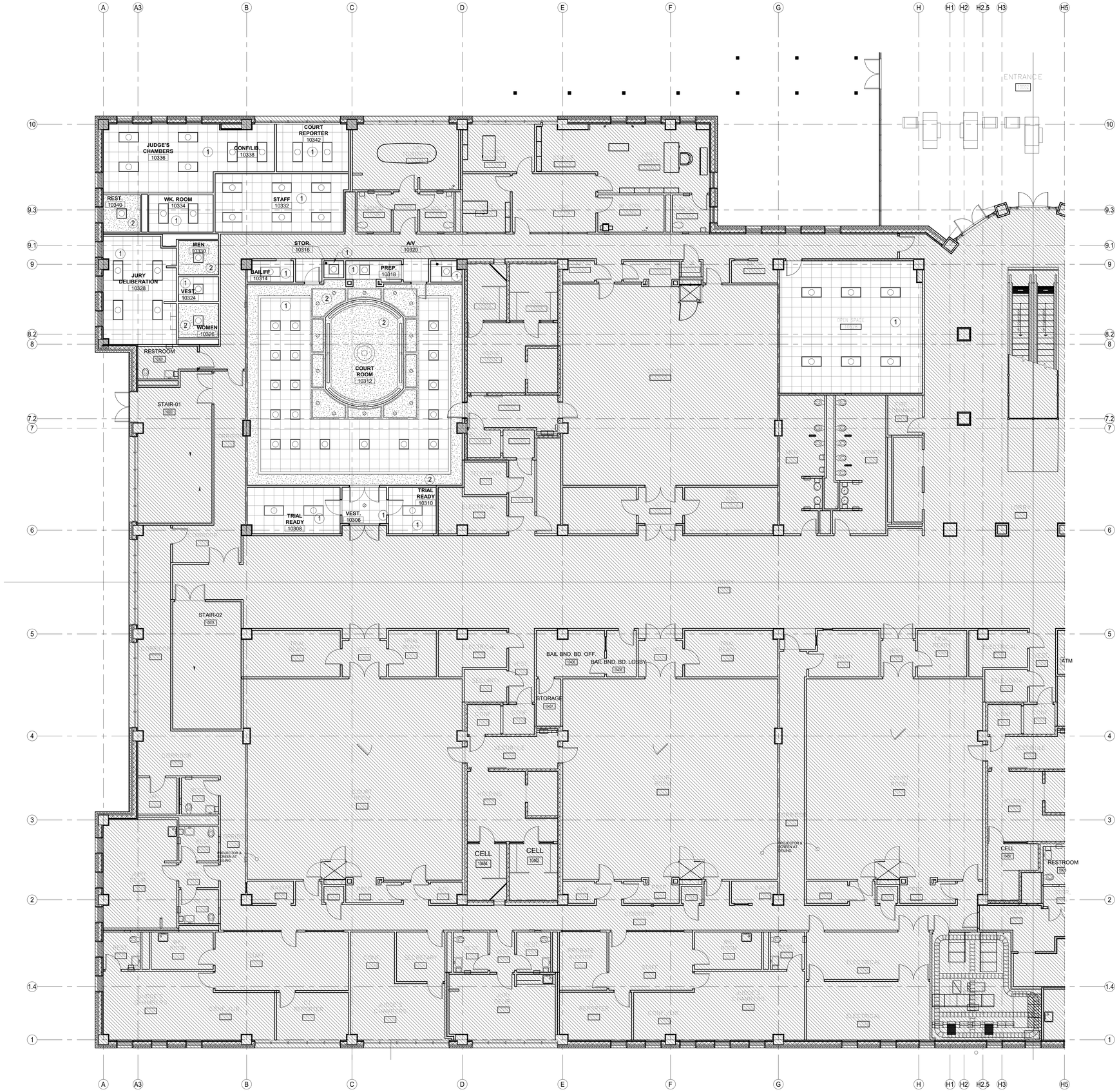
**SHEET TITLE**

LEVEL 1 PARTIAL FLOOR PLAN B

**SHEET NUMBER**

A2.12

**FILE NAME:** C:\@RevitLocals\Fort Bend County Justice Center\FBC_ARCH_R23.rvt
**DATE STAMP:** 10/17/2024 10:57:54 AM




## LEVEL 1 REFLECTED CEILING PLAN A

1/8" = 1'-0" (1)

# GENERAL RCP NOTES

1. REFER TO DRAWING G0.03 FOR PROJECT INFORMATION.
2. REFER TO DRAWING SERIES A0.10 FOR PARTITION TYPES.
3. REFER TO DRAWING SERIES A0.20 FOR FINISH SCHEDULES AND MATERIALS, AND CEILING HEIGHTS.
4. REFER TO DRAWING SERIES A0.30 FOR DOOR SCHEDULES, TYPES AND DETAILS.
5. REFER TO DRAWING SERIES A0.40 FOR WINDOW SCHEDULES, TYPES, AND DETAILS.
6. REFER TO DRAWING SERIES A0.50 FOR SIGNAGE SCHEDULES AND TYPES.
7. REFER TO DRAWING SERIES A2.00 FOR FLOOR PLANS.
8. REFER TO DRAWING SERIES A4.00 FOR ENLARGED FLOOR PLANS.
9. REFER TO DRAWING SERIES A8.00 FOR INTERIOR ELEVATIONS AND DETAILS.
10. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
11. COORDINATE DUCTWORK, LIGHT FIXTURE, AND FIRE ALARM SYSTEMS REQUIREMENTS WITH MEP DOCUMENTS. LOCATIONS FOR ALL FIXTURES AND DEVICES SHALL BE PER ARCHITECTURAL DRAWINGS.
12. CENTER FIXTURES AND/OR DEVICES WITHIN CEILING PANELS UNLESS OTHERWISE NOTED. ALL FIXTURES (INCLUDING LIGHT FIXTURES, SPEAKERS AND EMERGENCY LIGHTS) SHALL BE POSITIONED CENTERED IN CEILING PANELS AS SHOWN ON ARCHITECTURAL DRAWINGS.
13. REFER TO MEP DOCUMENTS FOR ALL SUPPLY AND RETURN DIFFUSERS TYPES. LOCATION PER ARCHITECTURAL DRAWINGS.
14. ALL DEVICES (INCLUDING JUNCTION BOXES, VAV/HVAC CONTROLS, SHUT OFF VALVES, ETC.) REQUIRING ACCESS WILL BE REMOTELY LOCATED AWAY FROM DRYWALL CEILINGS TO MINIMIZE ACCESS PANEL REQUIREMENTS. LOCATIONS OF REQUIRED ACCESS PANELS SHALL BE SUBMITTED FOR REVIEW BY ARCHITECT.
15. COORDINATE LOCATIONS OF ACCESS PANELS IN HARD CEILING WITH LOCATION OF MEP EQUIPMENT, JUNCTION BOXES, VALUES, DAMPERS, ETC. REQUIRING ACCESS.
16. REUSE STORED 2X4 RECESSED FLUORESCENT FIXTURES.
17. DO NOT SCALE DIMENSIONS FROM DRAWINGS, ANY UNKNOWN DIMENSION SHALL BE OBTAINED FROM DESIGN PROFESSIONALS VIA REQUEST FOR INFORMATION (RFI).
18. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
19. CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCY, INACCURACY OR CONFLICTING INFO. PRIOR TO EXECUTION OF THE WORK.
20. LIGHT FIXTURES ARE DIMENSIONED TO CENTERLINE OF FIXTURE, OR PROVIDE THE "CL" (CENTERLINE) SYMBOL, AND / OR LINE TYPE ON THE DIMENSION STRING AT EACH FIXTURE.
21. REFER TO ELECTRICAL DRWGS FOR FIXTURE DESIGNATIONS AND TYPES.
22. FIXTURES SHALL BE CENTERED BETWEEN WALLS U.N.O.
23. CEILING GRIDS SHALL BE CENTERED IN ROOMS U.N.O.

# KEYED NOTES

1. ACOUSTICAL TILE LAY -IN CEILING
2. 2 PAINTED GYPSUM BOARD CEILING
3. 10 GAUGE WELDED SECURITY METAL CEILING

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**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX
77469

**PROJECT NUMBER**

1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL REFLECTED CEILING PLAN A

**SHEET NUMBER**

A3.11

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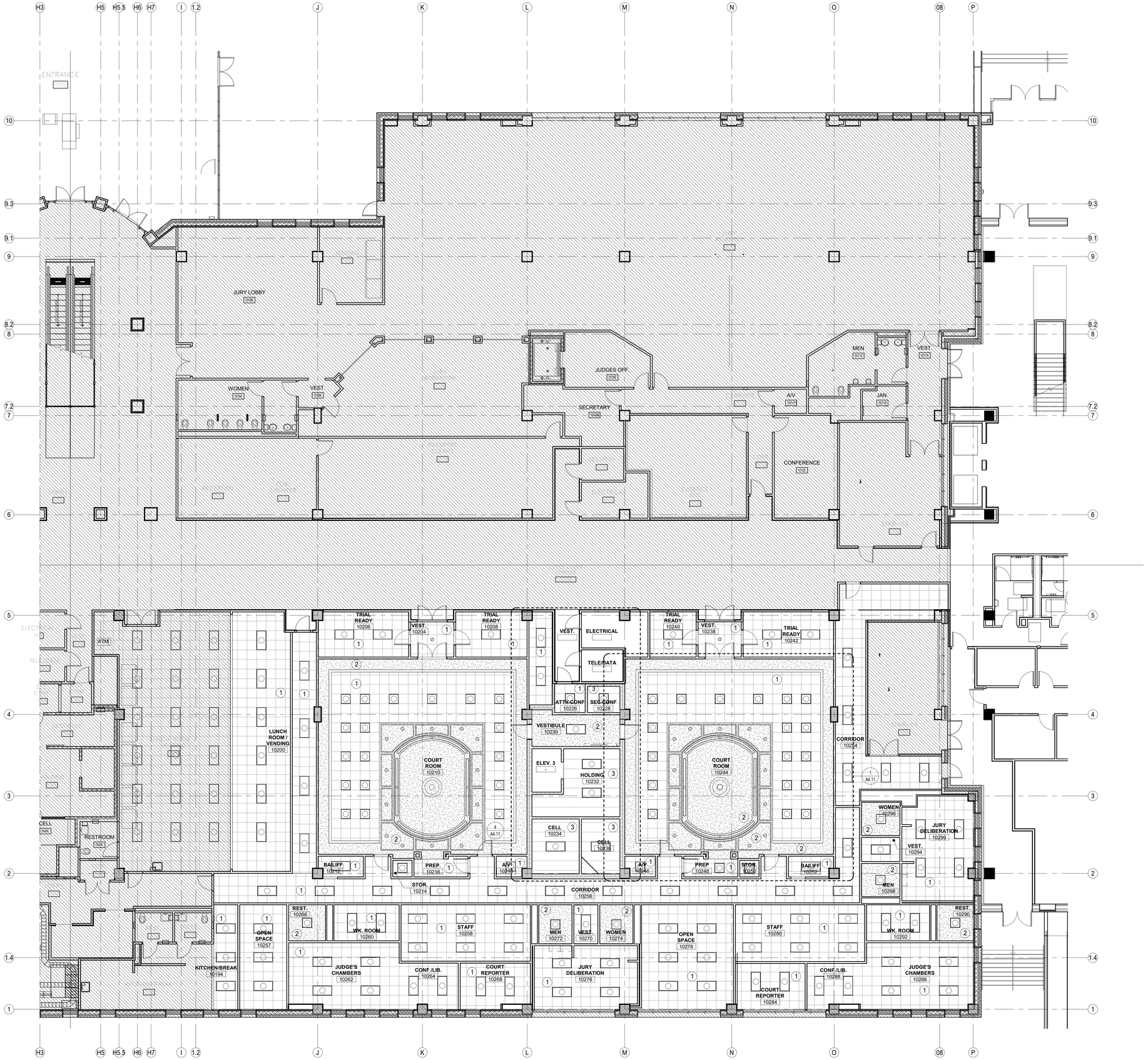


## LEVEL 1 REFLECTED CEILING PLAN B | 1/8" = 1'-0" (1)

# GENERAL RCP NOTES

1. REFER TO DRAWING G0.03 FOR PROJECT INFORMATION.
2. REFER TO DRAWING SERIES A0.10 FOR PARTITION TYPES.
3. REFER TO DRAWING SERIES A0.20 FOR FINISH SCHEDULES AND MATERIALS, AND CEILING HEIGHTS.
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# KEYED NOTES

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2. 2 PAINTED GYPSUM BOARD CEILING
3. 10 GAUGE WELDED SECURITY METAL CEILING


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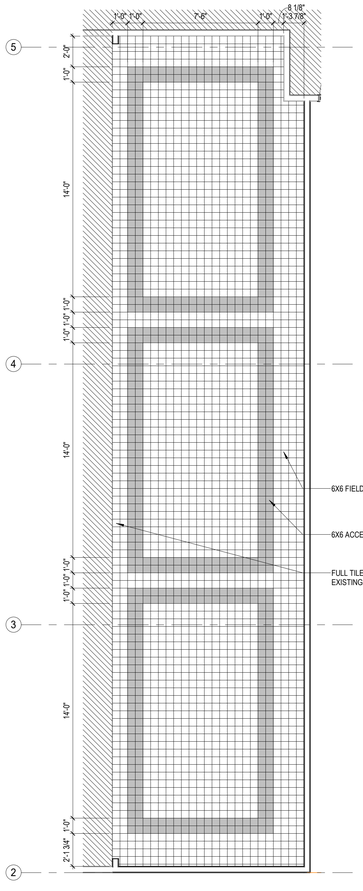
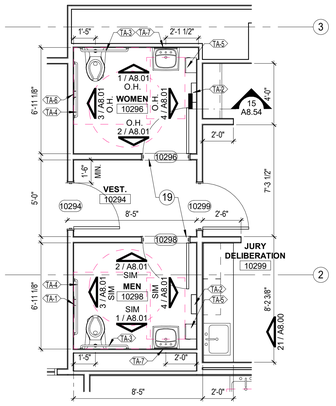
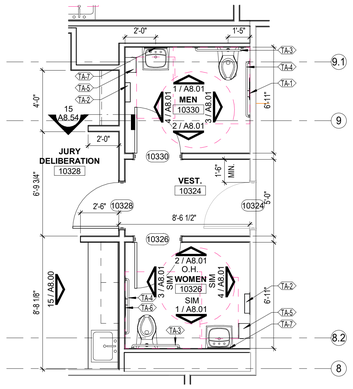


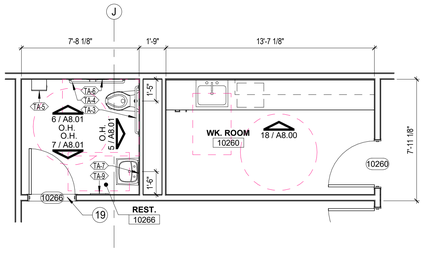

LUNCH ROOM FLOOR PATTERN 1/4" = 1'-0" (29)



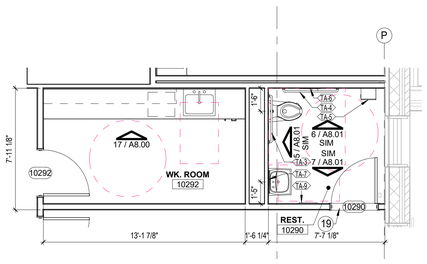

ENLARGED FLOOR PLAN - 10299 - JURY DELIB. RESTROOM 1/4" = 1'-0" (25)



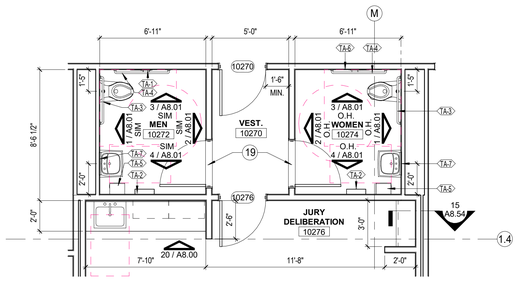

ENLARGED FLOOR PLAN - 10328 - JURY DELIB. RESTROOM 1/4" = 1'-0" (24)



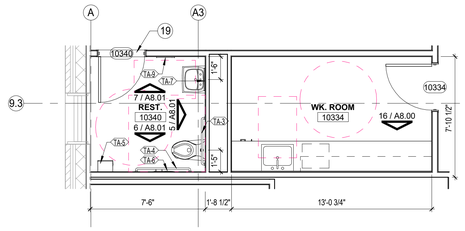

ENLARGED FLOOR PLAN - 10266 - RESTROOM 1/4" = 1'-0" (12)



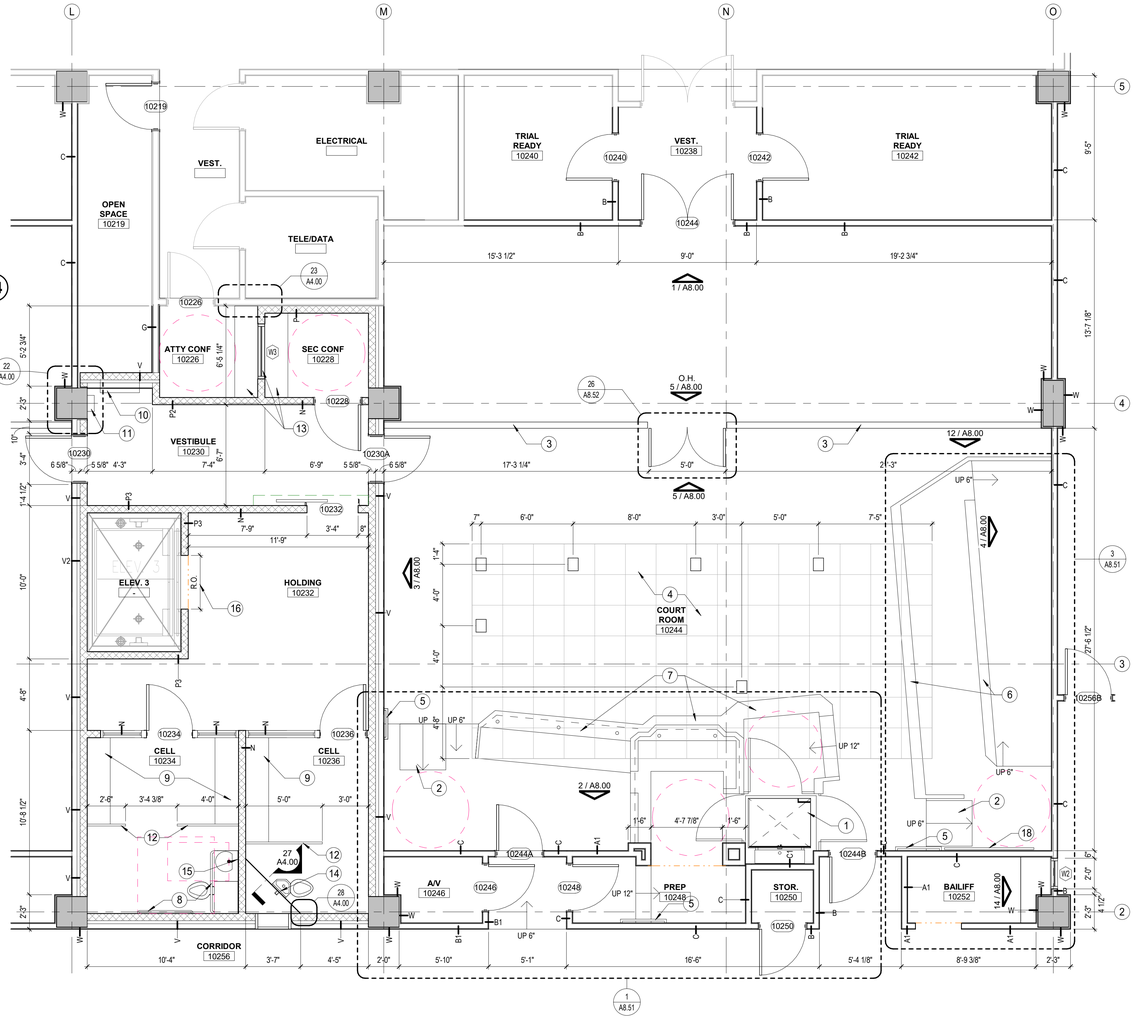

ENLARGED FLOOR PLAN - 10290 - RESTROOM 1/4" = 1'-0" (3)



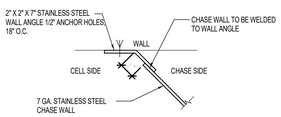

ENLARGED FLOOR PLAN - 10276 - JURY DELIB. RESTROOM 1/4" = 1'-0" (11)



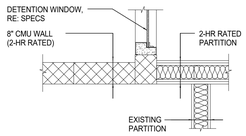

ENLARGED FLOOR PLAN - 10340 - RESTROOM 1/4" = 1'-0" (2)



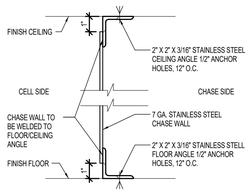

ENLARGED FLOOR PLAN - TYPICAL COURTROOM 1/4" = 1'-0" (1)



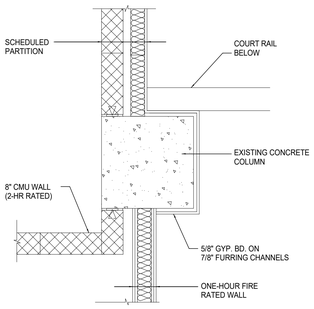

CHASE WALL DETAIL 3" = 1'-0" (28)




PLAN DETAIL 3/4" = 1'-0" (23)




CHASE WALL SECTION 3" = 1'-0" (27)




PLAN DETAIL 3/4" = 1'-0" (22)

# GENERAL NOTES

1. ALL DIMENSIONS ARE TO FACE OF GYP BD, CMU OR CENTERLINE OF COLUMN U.N.O. FINISHES (TILE, STONE PANELS, ETC) ARE BEYOND LINE OF INDICATED DIMENSIONS.
2. REFER TO ARCHITECTURAL ELEVATIONS, DETAILS AND SPECIFICATIONS FOR WALL FINISHES, LOCATION AND ARRANGEMENT.
3. REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS AND SPECIFICATIONS FOR ALL FLOOR OPENINGS AND DEPRESSIONS, WALL FRAMING, SUSPENSION SYSTEMS, ETC. TO APPLY MATERIAL FINISHES CALLED FOR IN SCHEDULE OR DETAILS.
4. COORDINATE SIZE AND LOCATION OF ALL FLOOR OPENINGS WITH EQUIPMENT MANUFACTURER REQUIREMENTS.
5. REFER TO ROOM FINISH SCHEDULE AND INTERIOR ELEVATIONS FOR CEILING HEIGHTS AND FINISHES.
6. PROVIDE TREATED WOOD BLOCKING AT ALL MILLWORK & TOILET ACCESSORIES AS REQUIRED.
7. REFER TO G0.11 FOR TYPICAL TOILET FIXTURE AND ACCESSORY MOUNTING HEIGHTS.
8. REFER TO SPECIFICATIONS FOR DETENTION CELL PLUMBING FIXTURES AND TOILET ACCESSORIES.

# KEYED NOTES

1. WHEELCHAIR LIFT, RE: 21/A8.51
2. FLIP DOWN RAMP, RE: 18/A8.52
3. COURT RAIL, RE: INTERIOR ELEVATION AND 3/A8.52
4. ACCESS FLOOR, RE: 27/A8.52
5. WOOD HANDRAIL, RE: 25/A8.52
6. JURY BOX MILLWORK, RE: 1/A8.52
7. JUDGE'S BENCH, WITNESS, & CLERK'S MILLWORK, RE: SHEET A8.51
8. DETENTION GRADE GRAB BAR, RE: SPECS.
9. DETENTION BENCH, RE: 29/A8.52
10. PISTOL LOCKER WITH 4 COMPARTMENTS, RE: 17/A8.54 AND SPECS.
11. HEAVY-DUTY FIRE EXTINGUISHER CABINET WITH DETENTION LOCK MOUNTED TO WALL WITH MOUNTING BRACKET, RE: SPECS.
12. STAINLESS STEEL TOILET SHIELD, RE: 12/A8.54 AND SPECS.
13. SECURE WALL PANELS, SECURITY GLAZING AND DETENTION GRADE COUNTERS, RE: 11/A8.54 AND SPECS.
14. DETENTION MIRROR @ 54" A.F.F. (1M); RE: 14/A8.54 AND SPECS.
15. 2 DETENTION MIRRORS OVER EACH OTHER (2M); RE:14/A8.54 AND SPECS.
16. SAW-CUT ROUGH OPENING ON THE EXISTING CMU SHAFT WALL FOR NEW ELEVATOR DOOR AND FRAME, GROUT CMU SOLID AT JAMBS AND HEAD. PATCH AND REPAIR GYPSUM BOARD OPENINGS
17. RECESSED FIRE EXTINGUISHER CABINET, RE: SPECS
18. WALL MOUNTED 80" FLAT SCREEN MONITOR, RE: AV DRAWINGS
19. MARBLE THRESHOLD (F26)

# TOILET ACCESORIES

| TYPE | MANUFACTURER | MODEL | DESCRIPTION |
|---|---|---|---|
| TA-1 | BOBRICK | B-3474 | RECESSED SEAT COVER DISPENSER & TOILET TISSUE DISPENSER |
| TA-2 | BOBRICK | B-3644 | RECESSED WASTE RECEPTACLE |
| TA-3 | BOBRICK | B-5806X36 | 36" SST GRAB BAR WITH SNAP FLANGE |
| TA-4 | BOBRICK | B-5806X42 | 42" SST GRAB BAR WITH SNAP FLANGE |
| TA-5 | KIMBERLY-CLARK | | IN-SIGHT SANITOUCH ROLL TOWEL DISPENSER |
| TA-6 | BOBRICK | B-3574 | RECESSED SEAT COVER DISPENSER, SANITARY NAPKIN DISPOSAL, & TOILET TISSUE DISPENSER |
| TA-7 | BOBRICK | B-165 1836 | WALL MOUNTED MIRROR WITH STAINLESS STEEL FRAME |
| TA-9 | AJW ARCHITECTURAL PRODUCT | U440 | SEMI-RECESSED WASTE RECEPTACLE WITH 4" WALL OPENING |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REGISTERED ARCHITECT BRIAN T. SCOTT 16373 STATE OF TEXAS
10/17/2024

DRAWING HISTORY

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SHEET TITLE
ENLARGED FLOOR PLANS & DETAILS

SHEET NUMBER
A4.00

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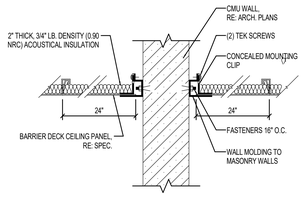
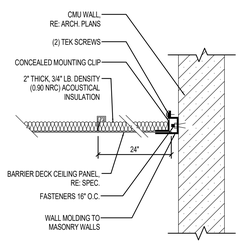
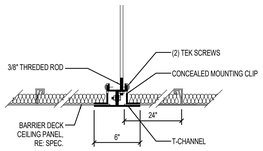


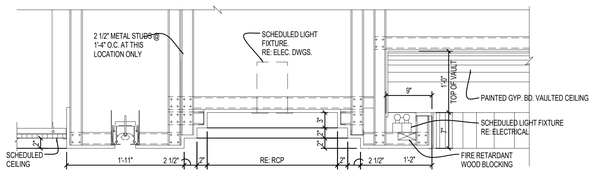

**SECURITY METAL CEILING CONNECTION** 1 1/2" = 1'-0" **20**



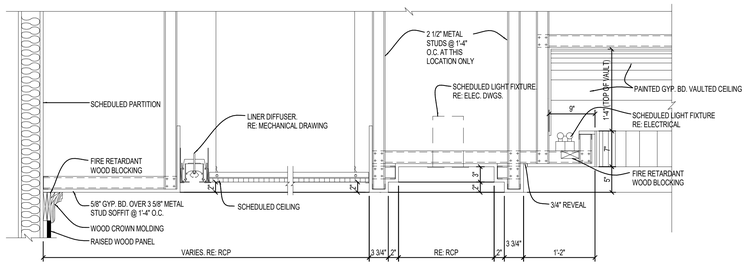

**SECURITY METAL CEILING CONNECTION** 1 1/2" = 1'-0" **24**



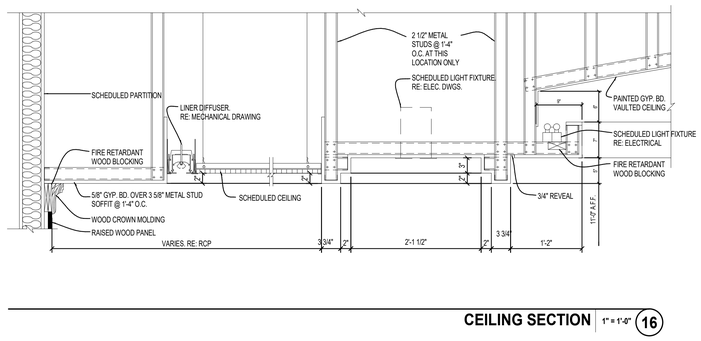

**SECURITY METAL CEILING CONNECTION** 1 1/2" = 1'-0" **19**



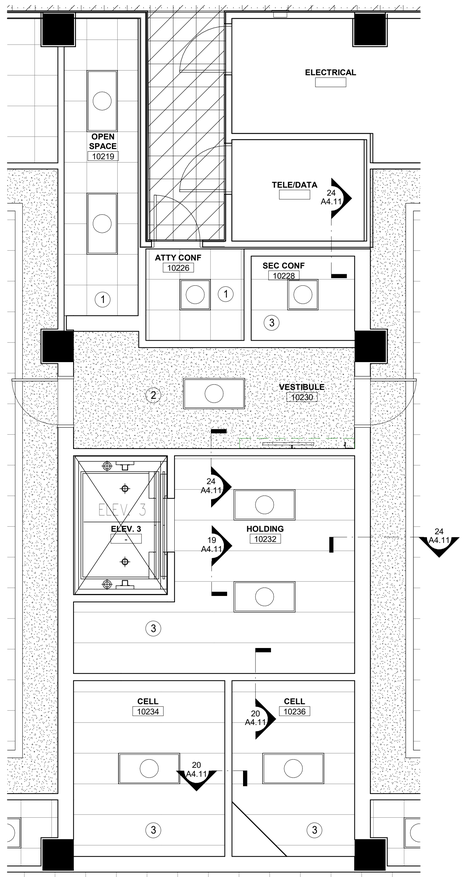

**CEILING SECTION** 1" = 1'-0" **18**



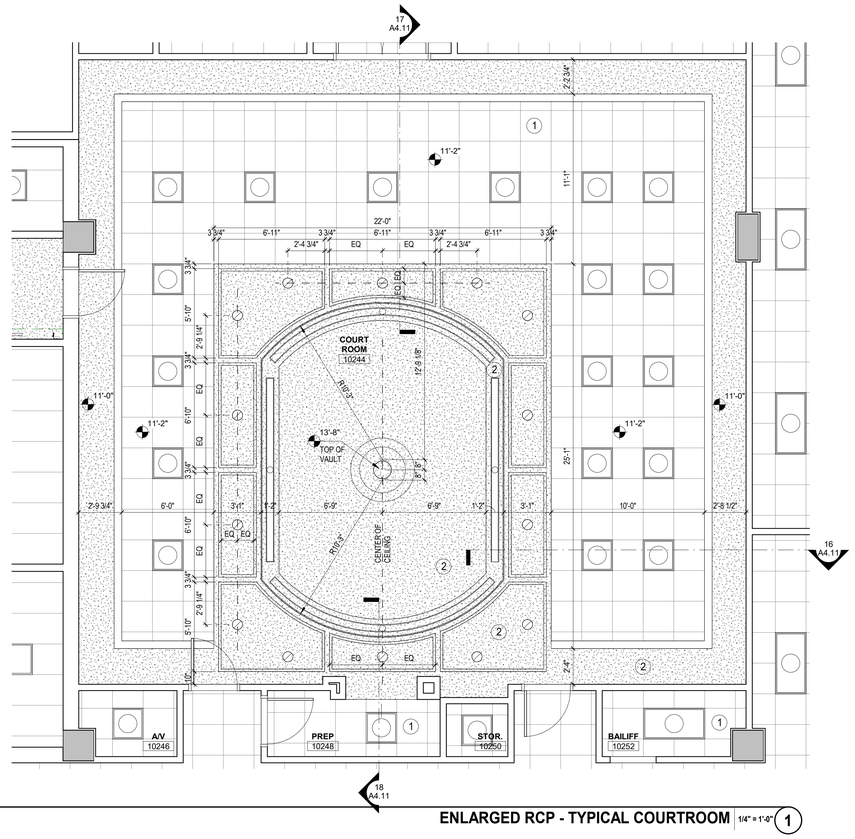

**CEILING SECTION** 1" = 1'-0" **17**




**CEILING SECTION** 1" = 1'-0" **16**




**REFLECTED CEILING PLAN - COURT HOLDING ROOM** 1/4" = 1'-0" **4**




**ENLARGED RCP - TYPICAL COURTROOM** 1/4" = 1'-0" **1**

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4. REFER TO DRAWING SERIES A0.30 FOR DOOR SCHEDULES, TYPES AND DETAILS.
5. REFER TO DRAWING SERIES A0.40 FOR WINDOW SCHEDULES, TYPES, AND DETAILS.
6. REFER TO DRAWING SERIES A0.50 FOR SIGNAGE SCHEDULES AND TYPES.
7. REFER TO DRAWING SERIES A2.00 FOR FLOOR PLANS.
8. REFER TO DRAWING SERIES A4.00 FOR ENLARGED FLOOR PLANS AND RCPS.
9. REFER TO DRAWING SERIES A8.00 FOR INTERIOR ELEVATIONS AND DETAILS.
10. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
11. COORDINATE DUCTWORK, LIGHT FIXTURE, AND FIRE ALARM SYSTEMS REQUIREMENTS WITH MEP DOCUMENTS. LOCATIONS FOR ALL FIXTURES AND DEVICES SHALL BE PER ARCHITECTURAL DRAWINGS.
12. CENTER FIXTURES AND/OR DEVICES WITHIN CEILING PANELS UNLESS OTHERWISE NOTED. ALL FIXTURES (INCLUDING LIGHT FIXTURES, SPEAKERS AND EMERGENCY LIGHTS) SHALL BE POSITIONED CENTERED IN CEILING PANELS AS SHOWN ON ARCHITECTURAL DRAWINGS.
13. REFER TO MEP DOCUMENTS FOR ALL SUPPLY AND RETURN DIFFUSERS TYPES. LOCATION PER ARCHITECTURAL DRAWINGS.
14. ALL DEVICES (INCLUDING JUNCTION BOXES, VAV/HVAC CONTROLS, SHUT OFF VALVES, ETC.) REQUIRING ACCESS WILL BE REMOTELY LOCATED AWAY FROM DRYWALL CEILINGS TO MINIMIZE ACCESS PANEL REQUIREMENTS. LOCATIONS OF REQUIRED ACCESS PANELS SHALL BE SUBMITTED FOR REVIEW BY ARCHITECT.
15. COORDINATE LOCATIONS OF ACCESS PANELS IN HARD CEILING WITH LOCATION OF MEP EQUIPMENT, JUNCTION BOXES, VALUES, DAMPERS, ETC. REQUIRING ACCESS.

## KEYED NOTES

1. 2'-0" X 2'-0" CEILING GRID AND TILE
2. PAINTED GYPSUM BOARD CEILING
3. 10 GAUGE WELDED SECURITY METAL CEILING

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10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

1007828.00

**SHEET TITLE**

ENLARGED REFLECTED CEILING PLANS

**SHEET NUMBER**

A4.11

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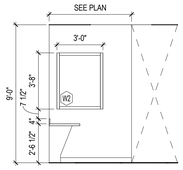
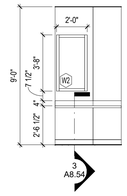



BAILIFF 1/4" = 1'-0" 19

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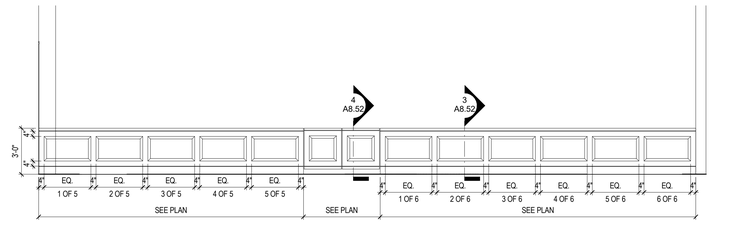
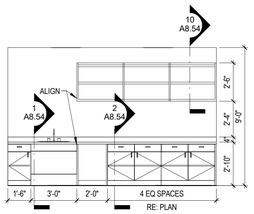
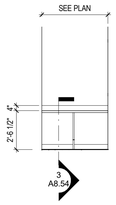



COURT RAIL COURT ROOM 1/4" = 1'-0" 5




WORK ROOM - 10260 1/4" = 1'-0" 18

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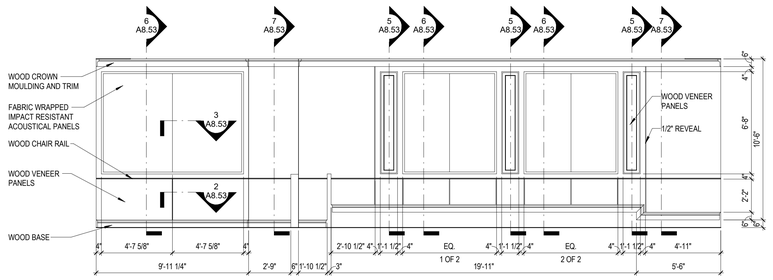
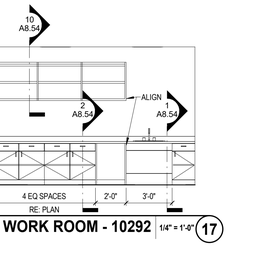



INTERIOR ELEVATION - COURT ROOM 1/4" = 1'-0" 4

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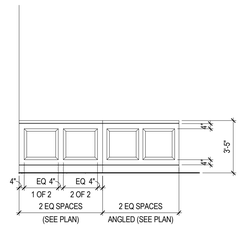
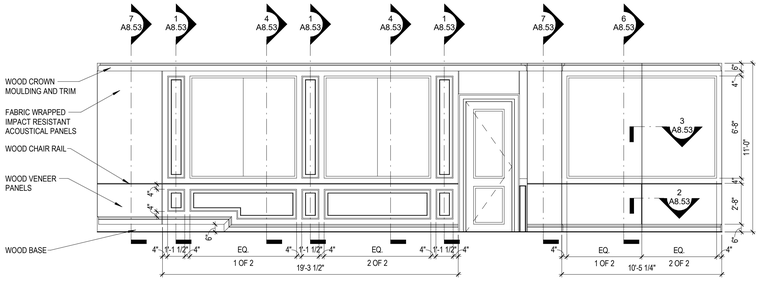



JURY BOX - COURT ROOM 1/4" = 1'-0" 12

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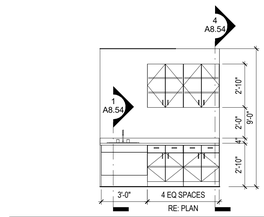
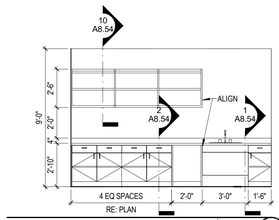



JURY DELIBERATION - 10299 1/4" = 1'-0" 21

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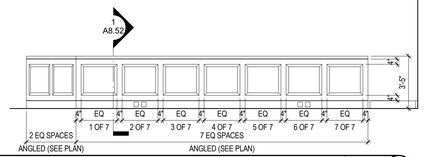
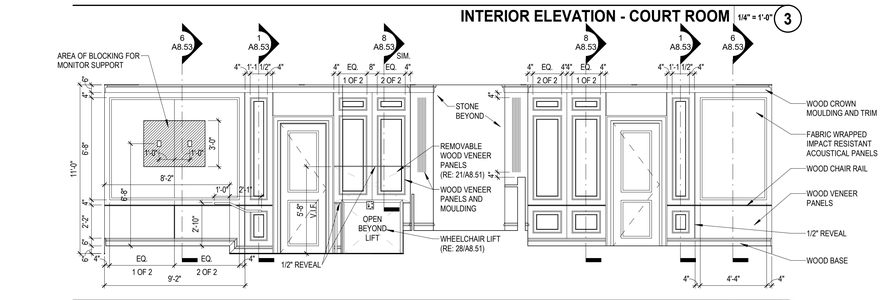
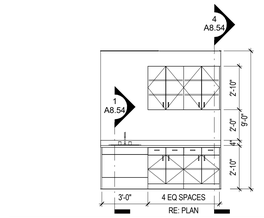


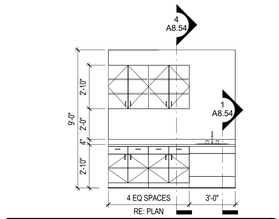

JURY BOX - COURT ROOM 1/4" = 1'-0" 11



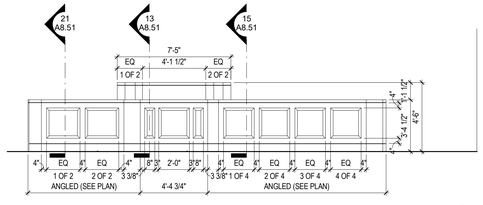

INTERIOR ELEVATION - COURT ROOM 1/4" = 1'-0" 2



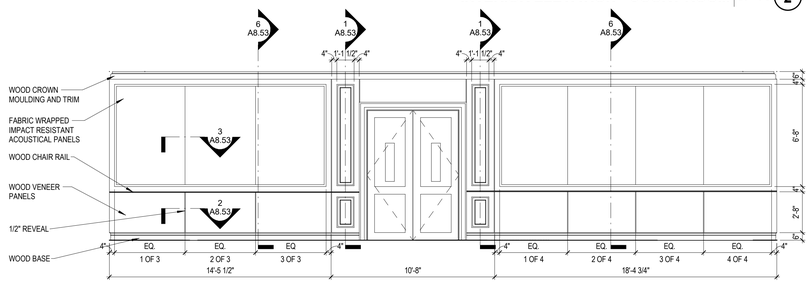

JURY DELIBERATION - 10276 1/4" = 1'-0" 20




JURY DELIBERATION - 10328 1/4" = 1'-0" 15




JUDGE'S BENCH - COURT ROOM 1/4" = 1'-0" 10




INTERIOR ELEVATION - COURT ROOM 1/4" = 1'-0" 1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REGISTERED ARCHITECT 6377 STATE OF TEXAS
10/17/2024

DRAWING HISTORY

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

PROJECT NAME
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

PROJECT LOCATION
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

PROJECT NUMBER
1007828.00

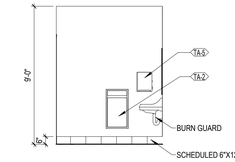
SHEET TITLE
INTERIOR ELEVATIONS

SHEET NUMBER
A8.00


FILE NAME: C:\@Revit\Locale\Fort Bend County Justice Center\FBC_ARCH_R23.rvt
DATE STAMP: 10/17/2024 10:58:21 AM

# TOILET ACCESORIES

| TYPE | MANUFACTURER | MODEL | DESCRIPTION |
|---|---|---|---|
| TA-1 | BOBRICK | B-3474 | RECESSED SEAT COVER DISPENSER & TOILET TISSUE DISPENSER |
| TA-2 | BOBRICK | B-3644 | RECESSED WASTE RECEPTACLE |
| TA-3 | BOBRICK | B-5806X36 | 36" SST GRAB BAR WITH SNAP FLANGE |
| TA-4 | BOBRICK | B-5806X42 | 42" SST GRAB BAR WITH SNAP FLANGE |
| TA-5 | KIMBERLY-CLARK | | IN-SIGHT SANITOUCH ROLL TOWEL DISPENSER |
| TA-6 | BOBRICK | B-3574 | RECESSED SEAT COVER DISPENSER, SANITARY NAPKIN DISPOSAL, & TOILET TISSUE DISPENSER |
| TA-7 | BOBRICK | B-165 1836 | WALL MOUNTED MIRROR WITH STAINLESS STEEL FRAME |
| TA-9 | AJW ARCHITECTURAL PRODUCT | U440 | SEMI-RECESSED WASTE RECEPTACLE WITH 4" WALL OPENING |

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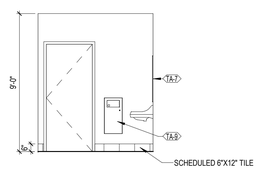


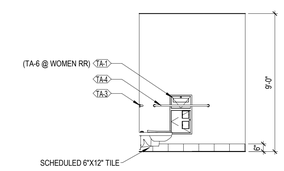


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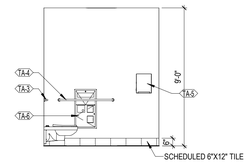


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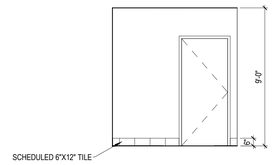


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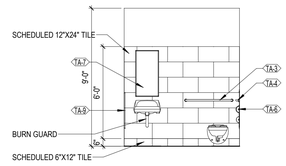


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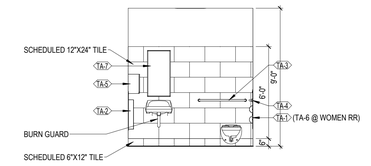


## JUDGE RESTROOM - ELEV 1 1/4" = 1'-0" 5

## MEN/WOMEN RESTROOM - ELEV 1 1/4" = 1'-0" 1

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10/17/2024

**DRAWING HISTORY**

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| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

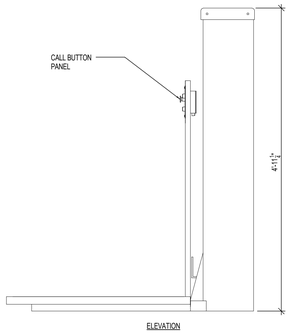
1007828.00

**SHEET TITLE**

INTERIOR ELEVATIONS

**SHEET NUMBER**

A8.01

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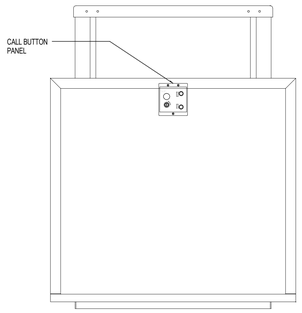


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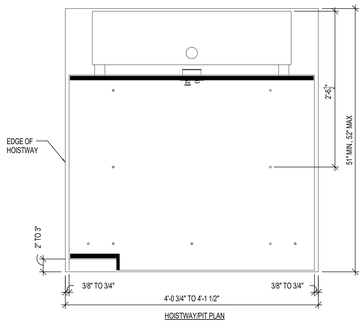
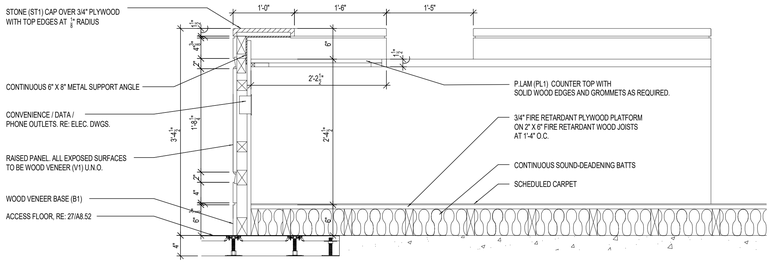
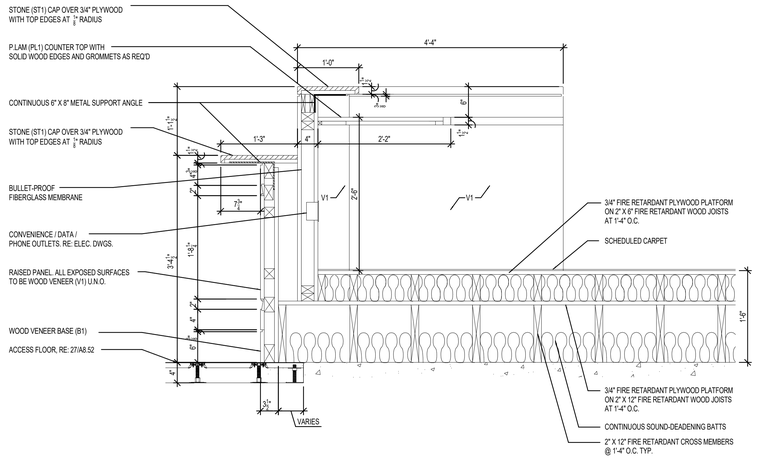



HOISTWAY/PIT PLAN

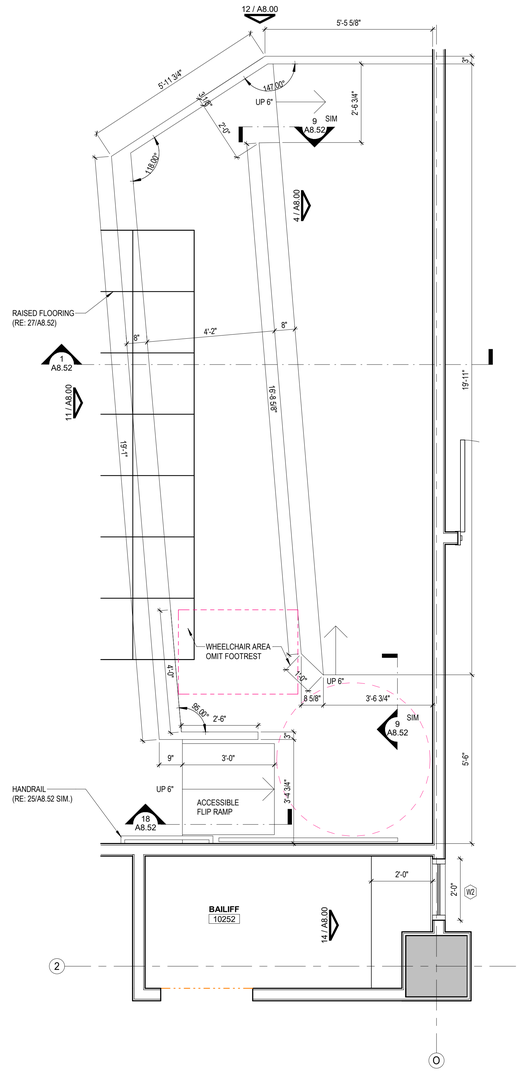
## WHEELCHAIR LIFT @ COURT ROOM 1" = 1'-0" 28



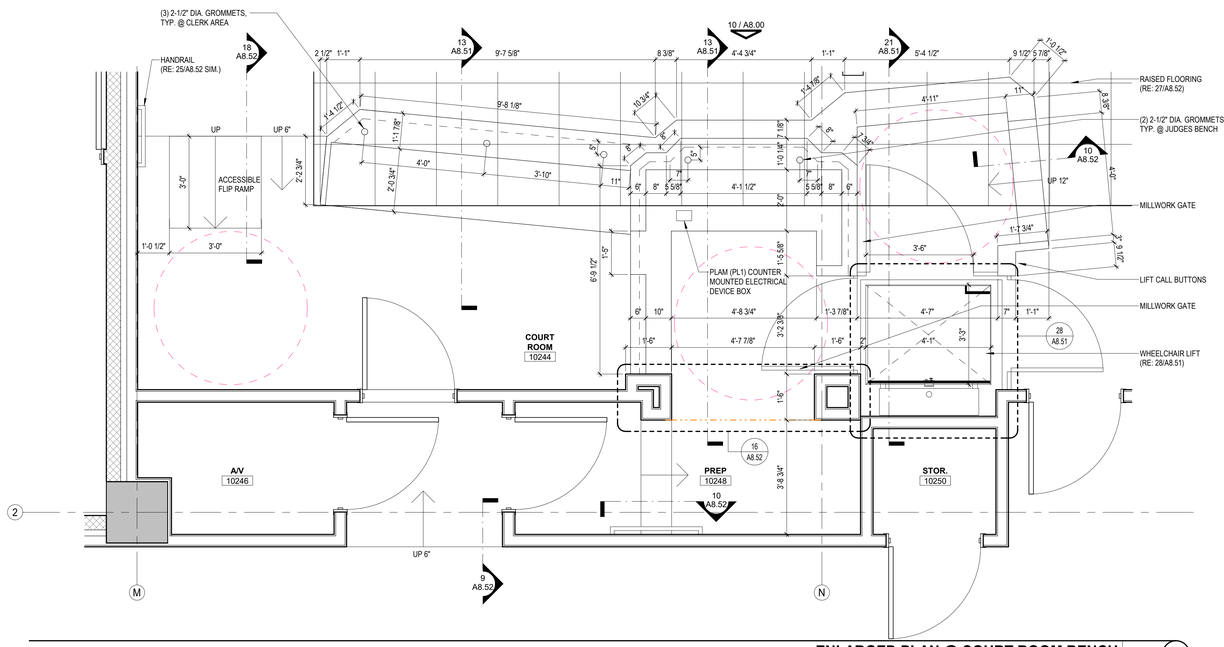

## SECTION @ CLERKS 1" = 1'-0" 15



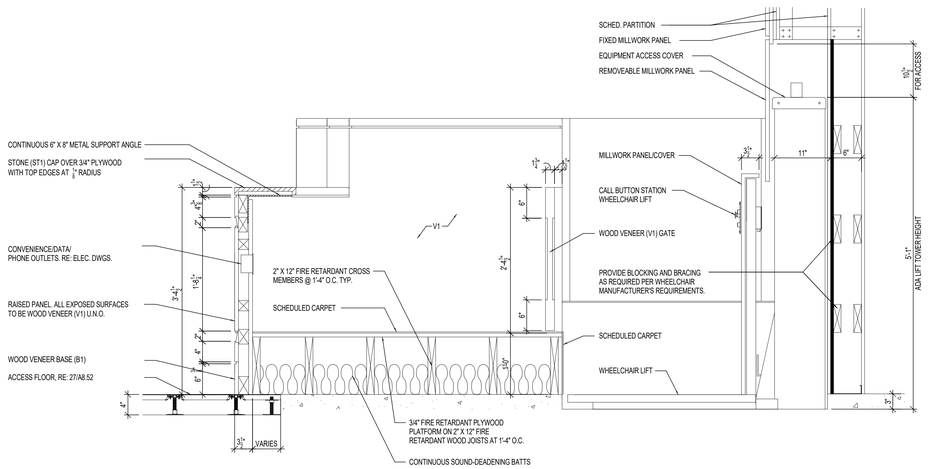

## SECTION @ JUDGE'S BENCH 1" = 1'-0" 13




## ENLARGED PLAN @ JURY BOX 1/2" = 1'-0" 3




## ENLARGED PLAN @ COURT ROOM BENCH 1/2" = 1'-0" 1




## SECTION @ WITNESS 1" = 1'-0" 21

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10/17/2024

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**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX
77469

**PROJECT NUMBER**

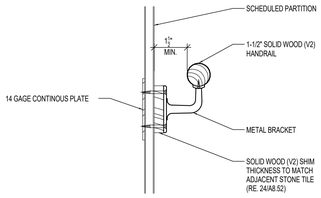
1007828.00

**SHEET TITLE**

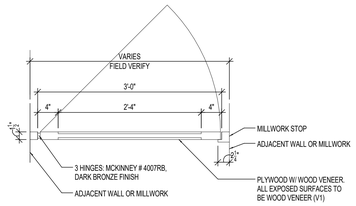
INTERIOR MILLWORK DETAILS

**SHEET NUMBER**

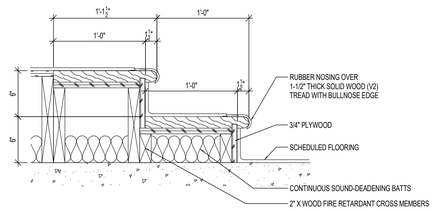
A8.51



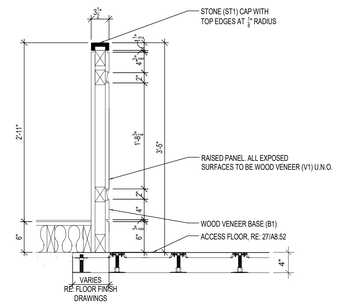

## HANDRAIL BRACKET | 3" = 1'-0" | 25



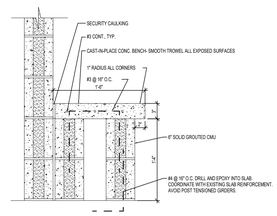

## SECTION @ WHEELCHAIR LIFT GATE | 1" = 1'-0" | 20



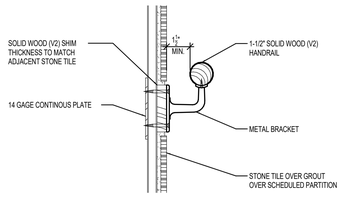

## PLATFORM STEPS | 1 1/2" = 1'-0" | 10



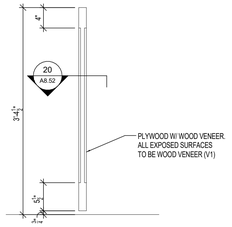

## SECTION @ JURY BOX RAIL | 1" = 1'-0" | 5



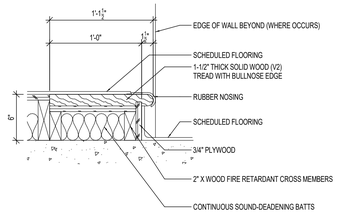

## DETENTION BENCH | 1" = 1'-0" | 29



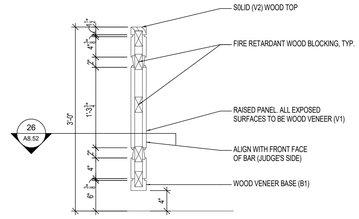

## HANDRAIL BRACKET @ STONE TILE | 3" = 1'-0" | 24



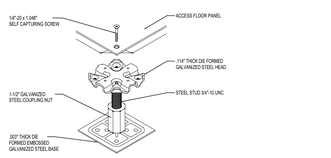

## SECTION @ WHEELCHAIR LIFT GATE | 1" = 1'-0" | 19



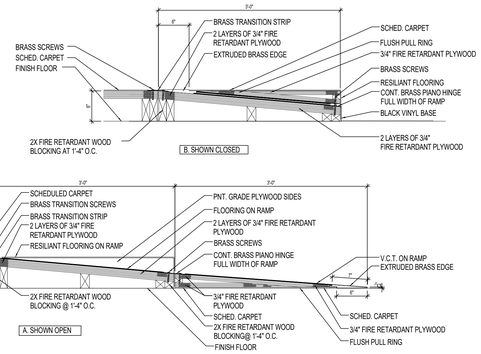

## RAISED PLATFORM | 1 1/2" = 1'-0" | 9



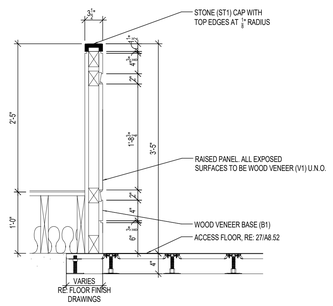

## SECTION @ COURT RAIL GATE | 1" = 1'-0" | 4



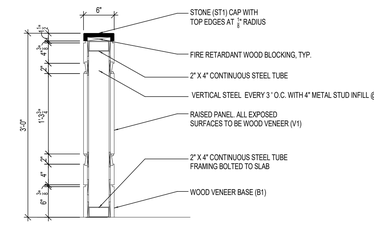

## ACCESS FLOOR FIELD PEDESTAL | 1" = 1'-0" | 28



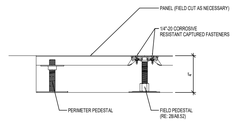

## ACCESSIBLE FLIP RAMP DETAIL | 1" = 1'-0" | 18



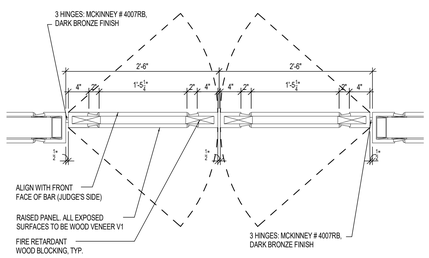

## SECTION @ JURY BOX RAIL | 1" = 1'-0" | 8



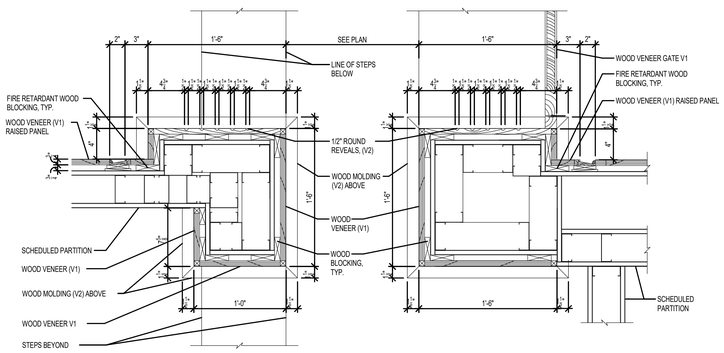

## SECTION @ COURT RAIL | 1" = 1'-0" | 3



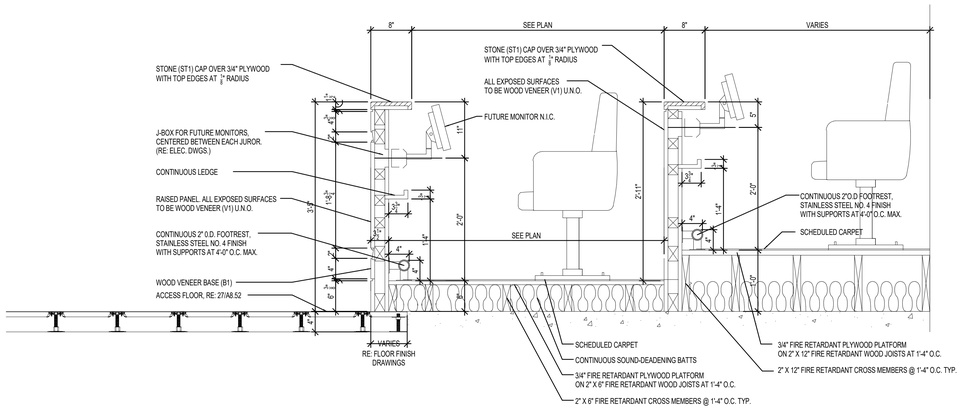

## ACCESS FLOOR | 1" = 1'-0" | 27




## SECTION @ COURT RAIL GATE | 1" = 1'-0" | 26




## JAMB @ COURT ROOM PORTAL | 1 1/2" = 1'-0" | 16




## SECTION @ JURY BOX | 1" = 1'-0" | 1

FILE NAME: C:\@Revit Locale\Fort Bend County Justice Center\FBC_ARCH_R23.rvt
DATE STAMP: 10/17/2024 10:58:31 AM

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**CONSULTANT**

**REGISTRATION**

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REGISTERED ARCHITECT
"637"
STATE OF TEXAS

10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE
HEIMANN CIRCLE
RICHMOND, TX
77469

**PROJECT NUMBER**

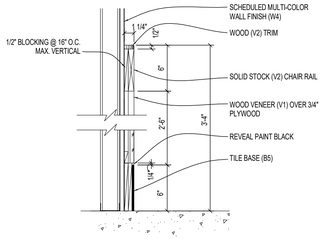
1007828.00

**SHEET TITLE**

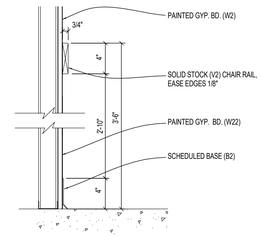
INTERIOR MILLWORK DETAILS

**SHEET NUMBER**

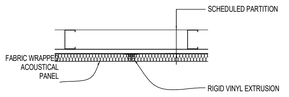
A8.52



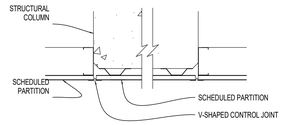

## WAINSCOT @ LOBBY WALLS 1 1/2" = 1'-0" 15



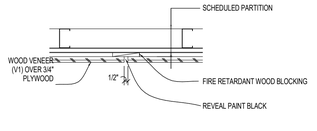

## WOOD CHAIR RAIL @ CORRIDOR WALLS 1 1/2" = 1'-0" 10



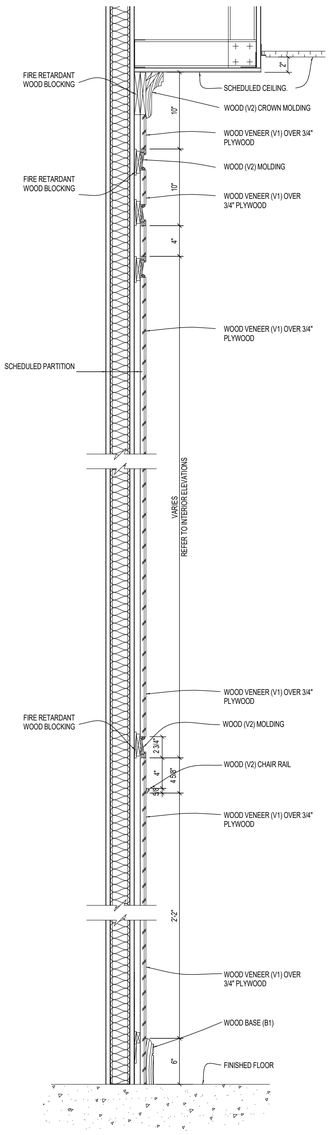

## VERTICAL FABRIC PANEL BUTT JOINT 1 1/2" = 1'-0" 3



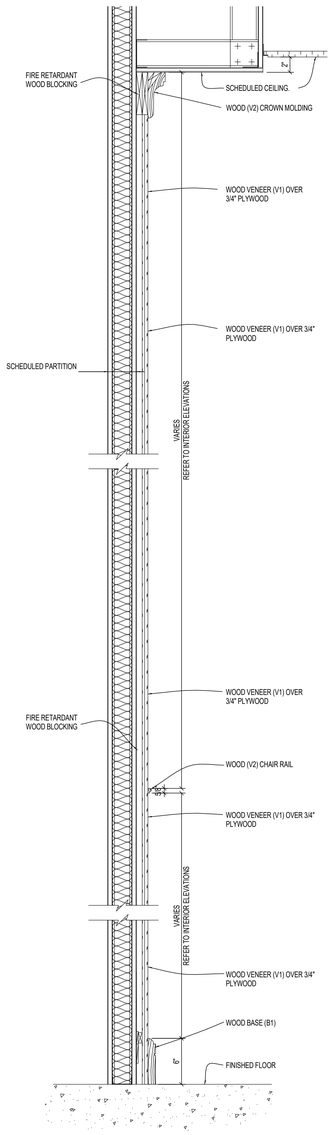

## VERTICAL V-SHAPED CONTROL JOINT 1 1/2" = 1'-0" 9



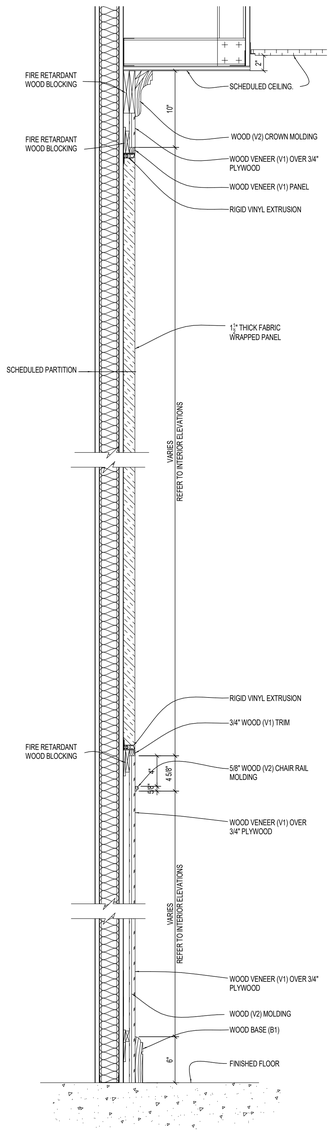

## VERTICAL WOOD VENEER JOINT 1 1/2" = 1'-0" 2



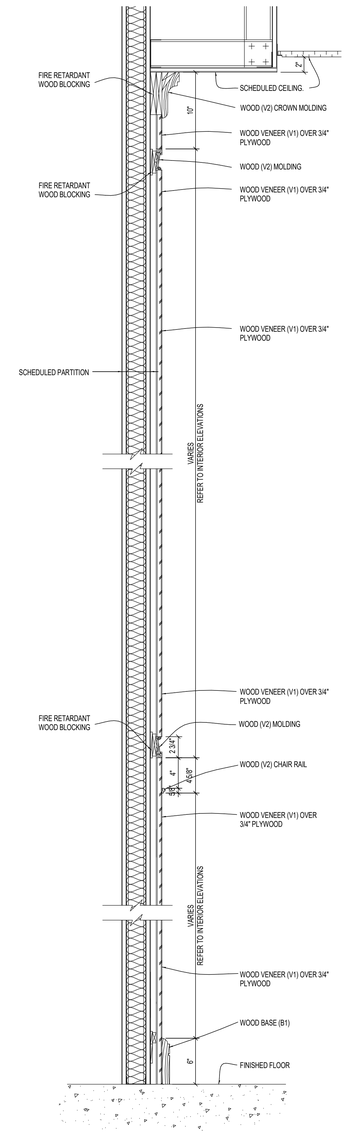

## SECTION @ WOOD VENEER PANELING 1 1/2" = 1'-0" 8



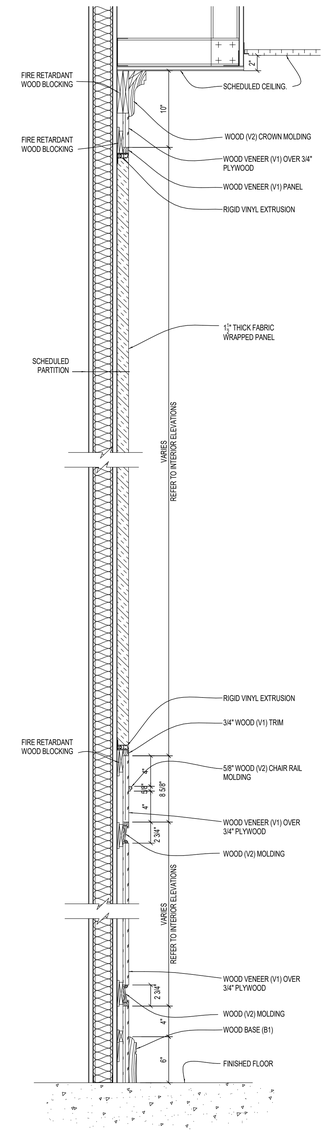

## SECTION @ WOOD VENEER PANELING 1 1/2" = 1'-0" 7



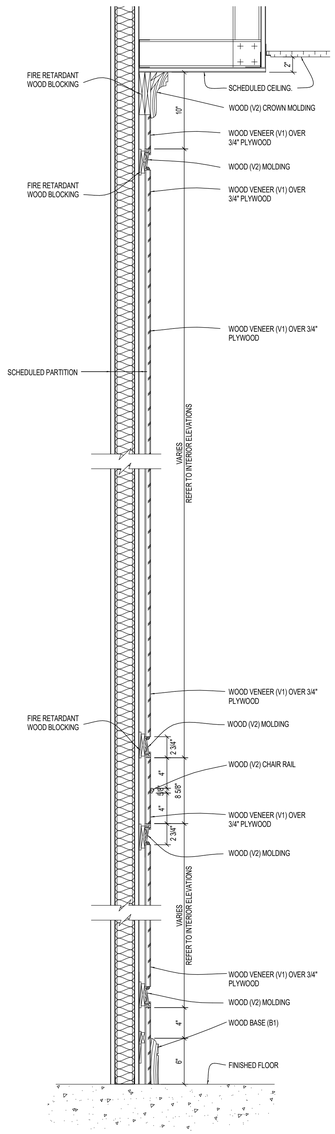

## SECTION @ FABRIC PANELING 1 1/2" = 1'-0" 6




## SECTION @ WOOD VENEER PANELING 1 1/2" = 1'-0" 5




## SECTION @ FABRIC PANELING 1 1/2" = 1'-0" 4




## SECTION @ WOOD VENEER PANELING 1 1/2" = 1'-0" 1

FILE NAME: C:\@Revit\Locals\Fort Bend County Justice Center\FBC_ARCH_R23.rvt
DATE STAMP: 10/17/2024 10:58:32 AM

**CLIENT**

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**REGISTRATION**

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REGISTERED ARCHITECT 16372 STATE OF TEXAS

10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

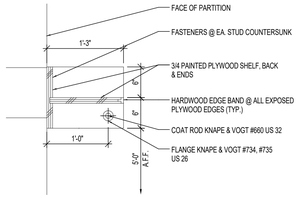
1007828.00

**SHEET TITLE**

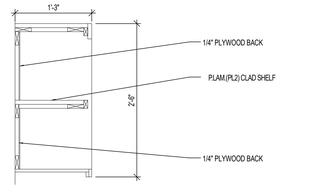
INTERIOR WALL DETAILS

**SHEET NUMBER**

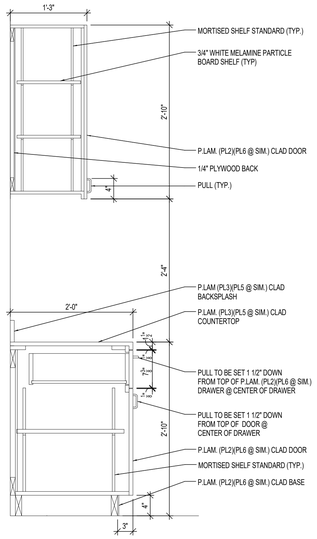
A8.53



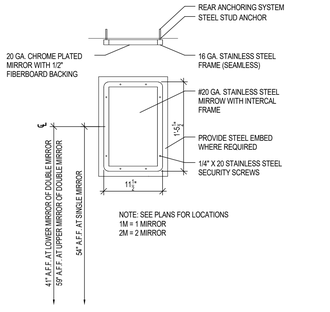

## SECTION @ COAT ROD & SHELF 1" = 1'-0" 15



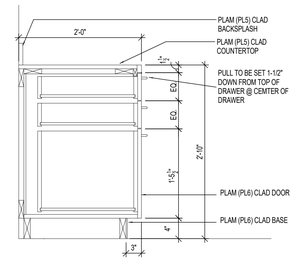

## SECTION @ OPEN UPPER CABINET 1" = 1'-0" 10



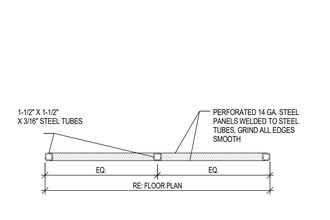

## SECTION @ BASE CABINET & TOP CABINET 1" = 1'-0" 4

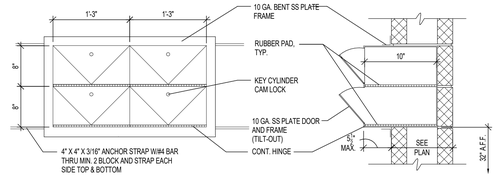



## STAINLESS STEEL DETENTION MIRROR 1" = 1'-0" 14

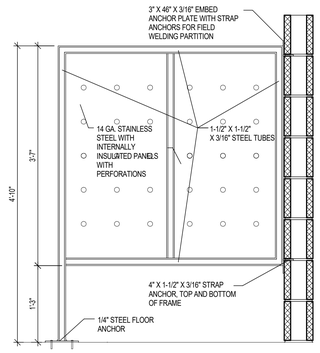



## SECTION @ BASE CABINET 1" = 1'-0" 9

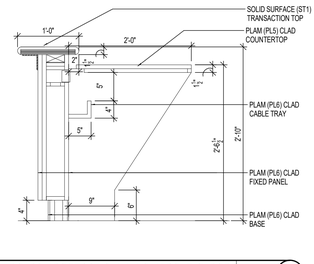


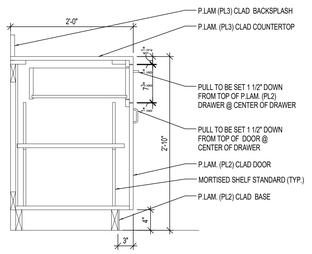

## PISTOL LOCKER 1" = 1'-0" 17



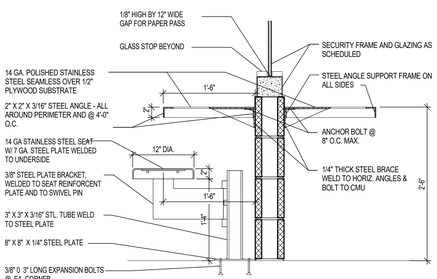

## STAINLESS STEEL TOILET SHIELD 1" = 1'-0" 12



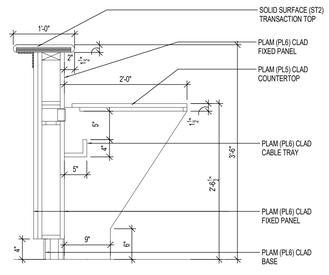

## SECTION @ REFERENCE DESK 1" = 1'-0" 7




## SECTION @ BASE CABINET 1" = 1'-0" 2




## DETENTION COUNTER 1" = 1'-0" 11

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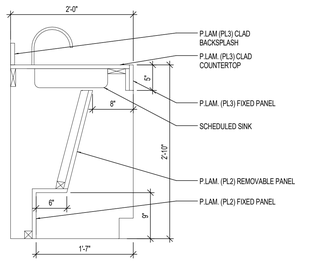
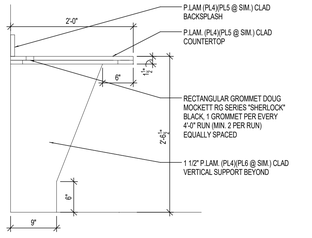



## SECTION @ BASE CABINET WITH SINK 1" = 1'-0" 1




## SECTION @ WORK COUNTER 1" = 1'-0" 3

# GENERAL NOTES

1. REFER TO FLOOR AND REFLECTED CEILING PLANS FOR ADDITIONAL INFORMATION.
2. REFER TO SHEET A0.20 FOR FINISH LEGEND AND SCHEDULE.
3. PROVIDE FIRE TREATED WOOD BLOCKING AS REQUIRED FOR ATTACHMENT OF MILLWORK AND TOILET ACCESSORIES.
4. CABINET TYPE, HEIGHT AND WIDTH ARE INDICATED ON INTERIOR ELEVATIONS.
5. FIELD VERIFY EXISTING DIMENSIONS PRIOR TO FABRICATION. NOTIFY ARCHITECT OF CONFLICTS AND DISCREPANCIES PRIOR TO FABRICATION.
6. VERIFY AND COORDINATE CLEAR DIMENSIONS REQUIRED FOR OWNER-FURNISHED EQUIPMENT (O.F.E.) LOCATED WITHIN OR ADJACENT TO ANY CASEWORK.
7. COORDINATE INSTALLATION OF SINKS WITH ASSOCIATED PIPING, FITTINGS AND WITH INSTALLATION OF ACCESSIBLE COVER PANELS.
8. REQUIRED SCRIBES AND FILLER PIECES SHALL BE INSTALLED TO ALLOW PROPER OPERATION OF DRAWERS/DOORS. THEY SHALL BE EVENLY DISTRIBUTED AND OF EQUAL WIDTH ALONG A SINGLE RUN OF CABINETS. THEY SHALL BE 3" WIDE, MAXIMUM EXCEPT INSIDE CORNER FILLERS SHALL BE 2 1/2" WIDE, MINIMUM.
9. WHERE BASE CABINETS INTERSECT AT INSIDE CORNER CONDITIONS PROVIDE WALL MOUNTED LEDGERS TO SUPPORT COUNTERTOP AT CORNERS. WHERE UPPER CABINETS INTERSECT AT INSIDE CORNER CONDITIONS PROVIDE HORIZONTAL FILLER PANEL FLUSH WITH BOTTOM OF CABINETS.
10. PROVIDE PLASTIC SCREW COVERS TO CONCEAL SCREW HEADS AT SEMI-EXPOSED CABINET SURFACES. ALL EXPOSED SCREWS SHALL HAVE COUNTERSUNK FINISHING WASHER.
11. ALL VERTICAL JOINTS BETWEEN CABINETS SHALL BE BUTT JOINTS.
12. PROVIDE FILLER PANELS AS NEEDED BETWEEN BUILT-IN APPLIANCES AND ADJACENT CABINETS OR WALLS.
13. ALL PLASTIC LAMINATE TO BE PL2 ON VERTICAL SURFACES, PL3 ON COUNTERTOPS AND BACKSPLASHES. ALL INTERIOR SURFACES TO BE WHITE MELAMINE UNLESS NOTED OTHERWISE (PL4 SHALL BE USED AT RESTROOM LAVATORY VERTICAL PANELS AND PARTITIONS.
14. ALL SOLID SURFACING TO BE S2, EXCEPT AT RESTROOM LAVATORIES WHERE SOLID SURFACING AT COUNTER TOPS SHALL BE S1.
15. COUNTERTOPS WITHOUT A SINK SHALL BE ON 3/4" HIGH DENSITY PARTICLE BOARD. AT COUNTERTOPS WITH A SINK, USE PLASTIC LAMINATE ON 3/4" PHENOLIC RESIN PARTICLE BOARD.
16. TYPICAL PLASTIC LAMINATE CLAD MATERIAL TO BE 3/4" MEDIUM DENSITY FIBERBOARD (MDF), EXCEPT AT COUNTERTOPS.
17. DRAWERS TO BE CONSTRUCTED WITH 3/4" MDF FRONT, 1/2" PAINTED MDF DRAWER BOXES AND 1/4" PAINTED TEMPERED HARDBOARD BOTTOMS LET INTO ALL FOUR DRAWER BOXES. BOX DRAWER FACES SHALL BE 5" HIGH AND FILE DRAWER FACES A MINIMUM OF 1'-1" HIGH. LATERAL FILES SHALL BE A MAXIMUM OF 42" WIDE.
18. CABINET BACKS TO BE 1/4" MELAMINE CLAD MDF. CLEATS TO BE AGAINST WALLS. PAINT FASTENERS TO MATCH INTERIOR FINISH OF CABINETS.
19. PROVIDE FIRE RETARDANT TREATED WOOD BLOCKING IN WALL FOR ALL WALL HUNG ACCESSORIES AND MILLWORK TO MEET CODE AND/OR INDUSTRY STANDARDS.
20. ALL CABINET EXPOSED SURFACES TO BE PLASTIC LAMINATE COVERED. SEMI-EXPOSED SURFACES (CABINET INTERIORS) TO BE MELAMINE COVERED. OPEN FACED CABINETS TO BE PLASTIC LAMINATE COVERED THROUGHOUT.
21. LAMINATE CLAD CABINETS. ALL PLASTIC LAMINATE CLAD CABINETS SHALL COMPLY WITH AWI SECTION 400 REQUIREMENTS. GRADE: CUSTOM. FLUSH OVERLAY CONSTRUCTION.
22. INTERIOR ARCHITECTURAL WOODWORK. ALL WOOD VENEERED CABINETS AND MILLWORK TO COMPLY WITH AWI SECTION400. PANELING TO COMPLY WITH AWI SECTION 200. CABINETS GRADE: BOOK MATCH WITH BALANCE MATCH ACROSS FACE OF MILLWORK ITEM. FINISH: AWI FINISH SYSTEM TR-6: CATALYZED POLYURETHANE. STAIN: MATCH ARCH. SAMPLE. SHEEN: SATIN 30-50 GLOSS UNITS.
23. TO THE GREATEST EXTENT POSSIBLE, FINISH ARCHITECTURAL WOODWORK INDICATED TO RECEIVE TRANSPARENT FINISH AT THE FABRICATION SHOP. DEFER ONLY FINAL TOUCH-UP, CLEANING AND POLISHING UNTIL AFTER INSTALLATION.

COUNTERTOP:
1. ALL COUNTERTOPS ARE 25" DEEP U.N.O.
2. ALL OUTSIDE COUNTERTOP CORNERS TO BE 1 1/2" RADIUS (IN PLAN) U.N.O.
3. REFER TO INTERIOR FINISH PLAN FOR COUNTERTOP MATERIAL. RE: A0.20 SERIES.
4. ALL BACK AND SIDE SPLASHES SHALL BE 4" TALL - 1/4" THICK P.LASTIC LAMINATE, 2 CM THICK SOLID SURFACE, U.N.O. ALL SPLASHES SHALL BE SCRIBED TO CONFORM TO THE SURFACE OF ABUTTING WALLS. ALL SPLASHES SHALL BE SEALED TO THE WALL WITH CLEAR SILICONE SEALANT.

BASE CABINETS:
1. PROVIDE SCHEDULED BASE MATERIAL ALONG BOTTOM OF EXPOSED FRONTS, BACKS, SIDES, AND ENDS OF ALL FIXED CABINETS, PEDESTALS, FINISHED END PANELS, KNEE SPACES, ETC., U.N.O.
2. ALL TOE KICK SPACES SHALL BE 4" TALL MINIMUM.
3. PROVIDE 1 1/2" THICK FINISHED END PANEL AT KNEE SPACE, UNDER COUNTER EQUIPMENT OPENINGS AND AT ADA SINKS THAT DO NOT ABUT A WALL OR OTHER CABINETS.

UPPER CABINETS:
1. TOP OF UPPER AND FULL HEIGHT CABINETS SHALL BE 8'-0" A.F.F. U.N.O. ON INTERIOR ELEVATIONS.
2. REFERENCE SERIES A3.00 (REFLECTED CEILING PLANS) FOR FURR DOWN LOCATIONS. WALL CABINETS WITHOUT A FURR DOWN ABOVE SHALL RECEIVE A CONTINUOUS 6" HIGH SLOPED PANEL, FINISHED TO MATCH CABINETS.
3. UPPER CABINETS DIMENSIONS ARE NOMINAL INCLUDING APRON.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**REGISTRATION**

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REGISTERED ARCHITECT 63172 STATE OF TEXAS

10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

1007828.00

**SHEET TITLE**

INTERIOR MILLWORK DETAILS

**SHEET NUMBER**

A8.54


**FILE NAME:** C:\@Revit\Locals\Fort Bend County Justice Center\FBC_ARCH_R23.rvt
**DATE STAMP:** 10/17/2024 10:58:34 AM

# ABBREVIATIONS

## A

| | |
|---|---|
| A | AIR (COMPRESSED) |
| ABV | ABOVE |
| A/C | AIR CONDITIONING |
| AC | ALTERNATING CURRENT, AIR COMPRESSOR |
| ACCH | AIR COOLED CHILLER |
| ACCU | AIR COOLED CONDENSING UNIT |
| AD | ACCESS DOOR, AREA DRAIN |
| ADJ | ADJUSTABLE |
| AF | AIR FILTER |
| AFC | ABOVE FINISHED CEILING |
| AFF | ABOVE FINISHED FLOOR |
| AFG | ABOVE FINISHED GRADE |
| AHRI | AIR-CONDITIONING, HEATING, AND REFRIGERATION INSTITUTE |
| AHU | AIR HANDLING UNIT |
| AL | ALUMINUM |
| AMB | AMBIENT |
| AP | ACCESS PANEL |
| APD | AIR PRESSURE DROP |
| ARCH | ARCHITECT, ARCHITECTURAL |
| AS | AIR SEPARATOR |
| ASHRAE | AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS |
| ASME | AMERICAN SOCIETY OF MECHANICAL ENGINEERS |
| ASTM | AMERICAN SOCIETY OF TESTING AND MATERIALS |
| AV | ACID VENT, AIR VENT |
| AVG | AVERAGE |
| AW | ACID WASTE |
| AWS | AMERICAN WELDING SOCIETY |
| AUX | AUXILIARY |

## B

| | |
|---|---|
| B | BOILER |
| BC | BELOW COUNTER |
| BJC | BACK OF CURB |
| BFF | BELOW FINISHED FLOOR |
| BFV | BUTTERFLY VALVE |
| BH | BOX HYDRANT |
| BLDG | BUILDING |
| BM | BENCHMARK |
| BOF | BOTTOM OF FOOTING |
| BOS | BOTTOM OF STRUCTURE |
| BP | BACKFLOW PREVENTER |
| BTU | BRITISH THERMAL UNIT |
| BV | BALL VALVE |
| BWV | BACK WATER VALVE |

## C

| | |
|---|---|
| C | CELSIUS |
| CAB | CABINET |
| CB | CATCH BASIN |
| CD | CONDENSATE DRAIN LINE |
| CFM | CUBIC FEET PER MINUTE |
| CFS | CUBIC FEET PER SECOND |
| CH | CHILLER |
| CHR | CHILLED WATER RETURN |
| CHS | CHILLED WATER SUPPLY |
| CHW | CHILLED WATER |
| CHWP | CHILLED WATER PUMP |
| CI | CAST IRON |
| CIRC | CIRCULATING |
| CL | CENTERLINE |
| CLG | CEILING |
| CLR | CLEAR |
| CMU | CONCRETE MASONRY UNIT |
| COL | COLUMN |
| COMB | COMBINATION |
| COMP | COMPRESSOR |
| CONC | CONCRETE, CONCENTRIC |
| COND | CONDENSER, CONDENSATE |
| CONN | CONNECTION |
| CONT | CONTINUOUS,CONTINUATION |
| CTR | CENTER |
| CU | COPPER |

## D

| | |
|---|---|
| D | DEPTH, DRAIN, DRYER |
| DB | DRY BULB |
| DC | DIRECT CURRENT |
| DDC | DIRECT DIGITAL CONTROL |
| DDMB | DUAL DUCT MIXING BOX |
| DESIG | DESIGNATION |
| DTL | DETAIL |
| DIA | DIAMETER |
| DIFF | DIFFUSER |
| DIM | DIMENSION |
| DISC | DISCONNECT |
| DN | DOWN |
| DPR | DAMPER |
| DW | DISHWASHER |
| DWG | DRAWING |
| DWH | DOMESTIC WATER HEATER |
| DWP | DOMESTIC WATER PUMP |
| DX | DIRECT EXPANSION |

## E

| | |
|---|---|
| EA | EACH |
| EAT | ENTERING AIR TEMPERATURE |
| EC | ELECTRICAL CONTRACTOR |
| ECC | ECCENTRIC |
| EDB | ENTERING DRY BULB |
| EDH | ELECTRIC DUCT HEATER |
| EF | EXHAUST FAN |
| EFF | EFFICIENCY |
| EJ | EXPANSION JOINT |
| EL | ELEVATION |
| ELEC | ELECTRICAL |
| EMERG | EMERGENCY |
| ENCL | ENCLOSURE |
| ENGR | ENGINEER |
| EQ | EQUAL |
| EQUIP | EQUIPMENT |
| ESP | EXTERNAL STATIC PRESSURE |
| ET | EXPANSION TANK |
| ETR | EXISTING TO REMAIN |
| EVAP | EVAPORATOR |
| EWB | ENTERING WET BULB |
| EWT | ENTERING WATER TEMPERATURE |
| EX | EXPLOSION PROOF |
| EXT | EXTERNAL |
| EXTG | EXISTING |

## F

| | |
|---|---|
| F | FAHRENHEIT, FIRE |
| FBO | FURNISHED BY OTHERS |
| FCO | FLOOR CLEAN OUT |
| FCS | FLOOR CONTROL STATION |
| FCU | FAN COIL UNIT |
| FD | FLOOR DRAIN, FIRE DAMPER |
| FDC | FIRE DEPARTMENT SIAMESE CONNECTION |
| FDV | FIRE DEPARTMENT VALVE |
| FH | FIRE HYDRANT |
| FHC | FIRE HOSE CABINET |
| FHR | FIRE HOSE RACK |
| FLA | FULL LOAD AMPS |
| FLEX | FLEXIBLE |
| FLR | FLOOR |
| FPTU | FAN POWERED TERMINAL UNIT |
| FT | FOOT, FEET |
| FUT | FUTURE |

## G

| | |
|---|---|
| G | GAS |
| GA | GAUGE |
| GAL | GALLON |
| GALV | GALVANIZED |
| GC | GENERAL CONTRACTOR |
| GLV | GLOBE VALVE |
| GND | GROUND |
| GPM | GALLONS PER MINUTE |
| GV | GATE VALVE |

## H

| | |
|---|---|
| HORIZ | HORIZONTAL |
| HP | HORSEPOWER |
| HSTAT | HUMIDISTAT |
| HT | HEIGHT |
| HTG | HEATING |
| HTR | HEATER |
| HW | HOT WATER |
| HWP | HEATING WATER PUMP |
| HWR | HOT WATER RETURN |
| HWS | HOT WATER SUPPLY |
| HX | HEAT EXCHANGER |
| HZ | HERTZ |

## I

| | |
|---|---|
| ID | INSIDE DIAMETER |
| IE | INVERT ELEVATION |
| IH | INFRARED HEATER |
| IN | INCH |
| INSUL | INSULATION |
| INT | INTERNAL, INTERIOR |
| INV | INVERT |
| IW | INDIRECT WASTE |

## J

| | |
|---|---|
| JB | JUNCTION BOX |
| JP | JOCKEY PUMP |

## K

| | |
|---|---|
| KEC | KITCHEN EQUIPMENT CONTRACTOR |
| KO | KNOCKOUT |
| KVA | KILOVOLT- AMPS |
| KW | KILOWATT |

## L

| | |
|---|---|
| L | LENGTH |
| LAT | LEAVING AIR TEMPERATURE |
| LAV | LAVATORY |
| LF | LINEAR FEET |
| LP | LOW PRESSURE |
| LRA | LOCKED ROTOR AMPS |
| LVL | LEVEL |
| LWB | LEAVING WET BULB |
| LWCO | LOW WATER CUT OFF |
| LWT | LEAVING WATER TEMPERATURE |

## M

| | |
|---|---|
| MAT | MIXED AIR TEMPERATURE |
| MAX | MAXIMUM |
| MBTUH | THOUSAND OF BTU'S |
| MC | MECHANICAL CONTRACTOR |
| MECH | MECHANICAL |
| MFR | MANUFACTURER |
| MH | MANHOLE |
| MI | MALLEABLE IRON |
| MIN | MINIMUM |
| MP | MEDIUM PRESSURE |
| MS | MOP SINK |
| MTD | MOUNTED |
| MU | MAKE-UP |
| MVD | MANUAL VOLUME DAMPER |
| MSAH | MINI-SPLIT AIR HANDLER |
| MSCU | MINI-SPLIT CONDENSING UNIT |

## N

| | |
|---|---|
| N.C. | NORMALLY CLOSED |
| NFPA | NATIONAL FIRE PROTECTION ASSOCIATION |
| NIC | NOT IN CONTRACT |
| N.O. | NORMALLY OPEN |
| NO. | NUMBER |
| NTS | NOT TO SCALE |

## O

| | |
|---|---|
| OA | OUTSIDE AIR |
| OAF | OUTSIDE AIR FAN |
| OAHU | OUTSIDE AIR HANDLING UNIT |
| OBD | OPPOSED BLADE DAMPER |
| OC | ON CENTER |
| OD | OUTSIDE DIAMETER, OVERFLOW DRAIN |
| OFCU | OUTSIDE AIR FAN COIL UNIT |
| OPG | OPENING |
| OS&Y | OPEN STEM AND YOLK |

## P

| | |
|---|---|
| PG | PRESSURE GAUGE |
| PP | POLYPROPYLENE |
| PPM | PART PER MILLION |
| PRI | PRIMARY |
| PRS | PRESSURE REDUCING STATION |
| PRV | PRESSURE REDUCING VALVE |
| PSF | POUNDS PER SQUARE FOOT |
| PSI | POUNDS PER SQUARE INCH |
| PSIG | POUNDS PER SQUARE INCH GAUGE |
| PV | PLUG VALVE |
| PVC | POLYVINYL CHLORIDE |

## Q

| | |
|---|---|
| QTY | QUANTITY |

## R

| | |
|---|---|
| RA | RETURN AIR |
| RAD | REFRIGERATED AIR DRYER |
| RAF | RETURN AIR FAN |
| RAG | RETURN AIR GRILLE |
| RAT | RETURN AIR TEMPERATURE |
| RCP | REFLECTED CEILING PLAN |
| RD | ROOF DRAIN |
| RE | REFERENCE, REFER |
| RED | REDUCER |
| REFR | REFRIGERATOR |
| REG | REGISTER |
| REINF | REINFORCING |
| REQD | REQUIRED |
| REV | REVISION, REVISE |
| RH | RELATIVE HUMIDITY |
| RHG | REFRIGERANT HOT GAS |
| RL | REFRIGERANT LIQUID |
| RLA | RUNNING LOAD AMPS |
| RM | ROOM |
| RPM | REVOLUTIONS PER MINUTE |
| RS | REFRIGERANT SUCTION |
| RTU | ROOFTOP UNIT |
| RV | RELIEF VALVE |

## S

| | |
|---|---|
| SA | SUPPLY AIR |
| SAF | SUPPLY AIR FAN |
| SAG | SUPPLY AIR GRILLE |
| SAN | SANITARY SEWER |
| SAR | SUPPLY AIR REGISTER |
| SC | STEAM CONDENSATE |
| SCHED | SCHEDULED |
| SD | STORM DRAIN |
| SEC | SECONDARY |
| SECT | SECTION |
| SENS | SENSIBLE |
| SF | SQUARE FEET |
| SFCS | SPRINKLER FLOOR CONTROL STATION |
| SH | SHOWER |
| SHT | SHEET |
| SIM | SIMILAR |
| SK | SINK |
| SM | SHEETMETAL |
| SP | STATIC PRESSURE, SUMP PUMP |
| SPEC | SPECIFICATION |
| SPR | SPRINKLER |
| SQ | SQUARE |
| SS | SERVICE SINK |
| SSSC | SOLID STATE SPEED CONTROL |
| STD | STANDARD |
| STL | STEEL |
| STR | STRAINER |
| SURF | SURFACE |
| SUSP | SUSPEND |
| SV | SANITARY VENT |
| SW | SOFT WATER |

## T

| | |
|---|---|
| TC | TEMPERATURE CONTROL |
| TCC | TEMPERATURE CORNEAL COMPRESSOR |
| TD | TRENCH DRAIN |
| TDH | TOTAL DYNAMIC HEAD |
| TF | TRANSFER FAN |
| TH BLK | THRUST BLOCK |
| THERM | THERMOMETER |
| TMV | THERMOSTATIC MIXING VALVE |
| TP | TRAP PRIMER |
| TPD | TRAP PRIMER DEVICE |
| TSP | TOTAL STATIC PRESSURE |
| TSTAT | THERMOSTAT |
| TW | TEMPERED HOT WATER |
| TYP | TYPICAL |

## U

| | |
|---|---|
| U | URINAL |
| UCD | UNDER CUT DOOR |
| UG | UNDERGROUND |
| UH | UNIT HEATER |
| UL | UNDERWRITERS LABORATORIES, INC |
| UNO | UNLESS NOTED OTHERWISE |
| U/F | UNDERFLOOR |
| U/S | UNDERSLAB |

## V

| | |
|---|---|
| V | VOLT |
| VA | VOLT- AMPERE |
| VAC | VACUUM |
| VAV | VARIABLE AIR VOLUME |
| VB | VALVE BOX. VACUUM BREAKER |
| VD | VOLUME DAMPER |
| VEL | VELOCITY |
| VERT | VERTICAL |
| VFD | VARIABLE FREQUENCY DRIVE |
| VIB | VALVE IN BOX |
| VOV | VALVE ON VERTICAL |
| VP | VACUUM PUMP |
| VR | VARIABLE AIR VOLUME REHEAT |
| VTR | VENT THRU ROOF |

## W

| | |
|---|---|
| W | WATT, WIDTH |
| W/ | WITH |
| W/O | WITHOUT |
| WB | WET BULB |
| WC | WATER CLOSET |
| WCO | WALL CLEAN OUT |
| WH | WALL HYDRANT |
| WM | WATER METER |
| WP | WEATHERPROOF |
| WPD | WATER PRESSURE DROP |
| WWF | WELDED WIRE FABRIC |

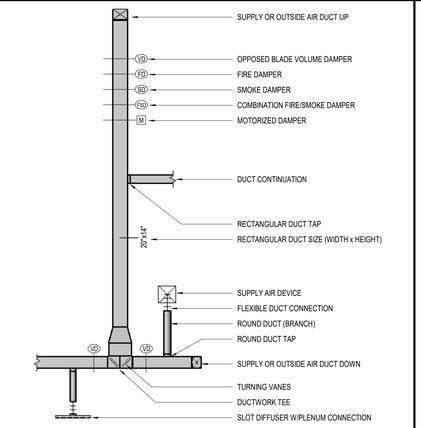
## Y

| | |
|---|---|
| Y | YARD HYDRANT |

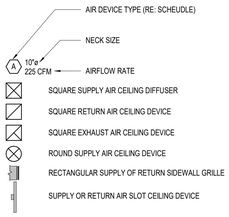
## Z

| | |
|---|---|
| Z | ZONE |

# DUCTWORK




# AIR DEVICE TYPES



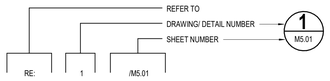

# WALL MOUNTED SENSOR TYPES

| | | | |
|---|---|---|---|
| T | THERMOSTAT | CO | CARBON MONOXIDE SENSOR |
| H | HUMIDISTAT | T | TEMPERATURE SENSOR |
| C | CARBON DIOXIDE SENSOR | $ | ON/OFF SWITCH |

# PIPING TYPES

| | | | |
|---|---|---|---|
| CD | CONDENSATE DRAIN LINE | HWR | HOT WATER RETURN |
| CHS | CHILLED WATER SUPPLY | CWS | CONDENSER WATER SUPPLY |
| CHR | CHILLED WATER RETURN | CWR | CONDENSER WATER RETURN |
| HWS | HOT WATER SUPPLY | REF | REFRIGERANT PIPING SIZED BY MFR. |

# DRAWING/DETAIL REFERENCE KEY




# MECHANICAL GENERAL NOTES

1. PIPING AND DUCTWORK SHOWN ON PLANS ARE SCHEMATIC ONLY. COORDINATE WITH OTHER TRADES FOR PIPING AND DUCTWORK ROUTING. OFFSET AND RUN PIPING DUCTWORK INSIDE THE STRUCTURE IF REQUIRED. PROVIDE ALL NECESSARY PIPING, DUCTWORK, FITTING, INSULATION, AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATIONS.
2. EXACT LOCATIONS OF EQUIPMENT, GRILLES, AND DAMPERS SHALL BE FIELD COORDINATED WITH OTHER TRADES TO AVOID CONFLICTS AND ALLOW ADEQUATE CLEARANCES.
3. EQUIPMENT SIZES, DIMENSIONS, AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE MANUFACTURER DRAWINGS AND CUTSHEETS BEFORE FABRICATING OF DUCTWORK, PIPING, OR POURING OF CONCRETE HOUSEKEEPING PADS.
4. SHEET METAL INLET DUCTS TO VAV TERMINAL UNITS SHALL BE SAME SIZE AS THE BOX INLET SIZE. PROVIDE RIGID ROUND DUCT THAT IS ONE SIZE LARGER THAN THE INLET BOX SIZE IF THE DISTANCE BETWEEN THE MAIN DUCT AND THE VAV BOX IS MORE THAN 6'-0".
5. PROVIDE CONICAL SPIN-IN CONNECTOR FOR ALL ROUND DUCT CONNECTIONS TO VAV TERMINAL UNITS.
6. INSTALL EQUIPMENT TO ENSURE ACCESS PANELS ARE NOT BLOCKED. ACCESS FOR SERVICE MUST BE PROVIDED.
7. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR FOR ALL ELECTRICAL POWER REQUIREMENTS.
8. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE DIMENSIONS.
9. PROVIDE RECTANGULAR BRANCH DUCT TAP FOR ALL RECTANGULAR DUCT CONNECTIONS TO RECTANGULAR DUCT TRUNKS.
10. ALL DUCTWORK AND ASSOCIATED ACCESSORIES SHALL BE CONSTRUCTED TO MEET THE LATEST SMACNA STANDARDS FOR HVAC DUCT CONSTRUCTION.
11. ALL OUTSIDE AIR, SUPPLY AIR, AND RETURN AIR DUCTWORK AND PLENUMS SHALL BE INSULATED WITH A MINIMUM OF R-6 INSULATION WHERE LOCATED IN UNCONDITIONED SPACES AND SHALL BE INSULATED WITH A MINIMUM OF R-8 INSULATION WHERE LOCATED OUTSIDE THE BUILDING. REFER TO SPECIFICATION 23 07 13 DUCT INSULATION FOR FURTHER INFORMATION AND ADDITIONAL REQUIREMENTS.
12. ALL DUCTWORK SHALL BE CONSTRUCTED TO SEAL CLASS 'A' AS REFERENCED IN SMACNA STANDARDS. ALL NON-WELDED JOINTS AND SEAMS SHALL BE SEALED. THIS INCLUDES BUT IS NOT LIMITED TO TRANSVERSE JOINTS, LONGITUDINAL SEAMS, DUCT WALL PENETRATIONS, SPIN-INS, TAPS, AND OTHER BRANCH CONNECTIONS, ACCESS DOORS, ACCESS PANELS, AND DUCT CONNECTIONS TO EQUIPMENT. OPENINGS FOR ROTATING SHAFTS SHALL ALSO BE SEALED WITH BUSHINGS. REFER TO SPECIFICATION 23 31 13 METAL DUCTWORK FOR FURTHER INFORMATION.
13. ALL EXPOSED DUCTWORK AND PIPING WITH ASSOCIATED ACCESSORIES IN AREAS WITH NO CEILING OR PARTIAL CEILING SHALL BE PAINTED. REFER TO ARCHITECT FOR COLOR.
14. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR PRIOR TO ACTUAL INSTALLATION OF TEMPERATURE SENSORS AND HUMIDITY SENSORS.
15. PROVIDE REMOTE SPIN-IN DAMPER OPERATOR FOR SPIN-IN CONNECTIONS AND VOLUME DAMPERS LOCATED OVER GYPSUM CEILINGS.
16. PROVIDE AIRFOIL TYPE TURNING VANES IN ALL 90 DEGREE ELBOWS.
17. PROVIDE INSULATED ACCESS DOORS FOR DUCTWORK DOWNSTREAM OF AIR HANDLING UNITS AT EVERY 20'-0" TO FACILITATE DUCT CLEANING. PROVIDE ACCESS DOORS WITHIN 5'-0" OF EACH ELBOW.
18. COORDINATE LOCATIONS OF FLOOR AND WALL OPENINGS WITH ARCHITECT AND STRUCTURAL ENGINEER.
19. ALL CEILING MOUNTED AND WALL MOUNTED AIR DEVICE FINISHES SHALL MATCH ADJACENT ARCHITECTURAL SURFACE. CONTRACTOR SHALL COORDINATE COLOR WITH ARCHITECT.
20. WHERE RETURN AIR PATHS ARE NEEDED IN WALLS TO STRUCTURE (TO ALLOW RETURN AIR FLOW BACK TO AIR HANDLING UNIT), PROVIDE RETURN AIR OPENING IN WALL ABOVE CEILING. SIZE OF OPENING SHALL BE LARGE ENOUGH SO THAT, AT PEAK TOTAL AIRFLOW, THE RETURN AIRFLOW THROUGH THE OPENING DOES NOT EXCEED 500 FPM VELOCITY. PROVIDE MULTIPLE OPENINGS, IF NECESSARY.

# ROOF MOUNTED EQUIPMENT ANCHORAGE REQUIREMENTS

1. ALL ROOF MOUNTED EQUIPMENT CURBS, ROOF MOUNTED EQUIPMENT, EQUIPMENT TIE DOWNS, AND CONNECTIONS OF ALL EQUIPMENT TO BUILDING STRUCTURE FOR WIND LOADING ARE TO BE DESIGNED AND ENGINEERED BY A REGISTERED SPECIALTY ENGINEER RETAINED BY THE CONTRACTOR. DESIGN CRITERIA FOR WIND LOADING SHALL BE AS INDICATED IN THE CONSTRUCTION DOCUMENTS AND PER LOCAL CODES FOR THE PROJECT LOCATION AND BUILDING CATEGORY. SIGNED AND SEALED DRAWINGS AND CALCULATIONS ARE TO BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL. THE SUBMITTAL SHALL INCLUDE ATTACHMENT DETAILS OF THE EQUIPMENT TO THE STRUCTURE WITH DESIGN LOADS, LOCATIONS, AND METHODS OF ATTACHMENT. THE CONTRACTOR SHALL ALSO SUBMIT THE INFORMATION TO THE STRUCTURAL ENGINEER TO COORDINATE THE DESIGN OF THE PRIMARY STRUCTURAL FRAME WITH THE FINAL LOADS AND ATTACHMENTS SUBMITTED.

# CONTROLS SCHEMATIC SYMBOLS LEGEND

| | | | |
|---|---|---|---|
| AI | ANALOG INPUT | FS | FLOW SWITCH |
| AO | ANALOG OUTPUT | DAT | DISCHARGE AIR TEMPERATURE SENSOR |
| DI/BI | DIGITAL/BINARY INPUT | S | WALL SENSOR |
| DO/BO | DIGITAL/BINARY OUTPUT | T | THERMOSTAT |
| MD | ON-OFF MOTORIZED DAMPER | CO2 | CARBON DIOXIDE SENSOR |
| MMD | MODULATING TYPE MOTORIZED DAMPER | SP | SET POINT |
| AFMS | AIR FLOW MEASURING STATION | S/A | SUPPLY AIR |
| MCV | CONTROL VALVE MODULATING TYPE | R/A | RETURN AIR |
| VFD | VARIABLE FREQUENCY DRIVE | O/A | OUTSIDE AIR |
| CSR | CURRENT SENSING RELAY | HC | HEATING COIL |
| FRZ | FREEZESTAT | CC | COOLING COIL |
| HSL | HIGH STATIC LIMIT | DX | DIRECT EXPANSION COOLING COIL |
| SPT | STATIC PRESSURE TRANSMITTER | PICCV | PRESSURE INDEPENDENT CHARACTERIZED CONTROL VALVE |
| DPT | DIFFERENTIAL PRESSURE TRANSDUCER | AFC | AIRFLOW CROSS |
| FM | FLOW METER | DPS | DIFFERENTIAL PRESSURE SWITCH |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DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

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REGISTRATION

STATE OF TEXAS
MIKE L. ASHCRAFT
56590
LICENSED
PROFESSIONAL ENGINEER
10/17/2024

DRAWING HISTORY

| № | DATE | DESCRIPTION |
|---|---|---|
| | 05/01/2024 | 100% DESIGN DEVELOPMENT |
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTRUCTION DOCUMENTS |
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

PROJECT NAME

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

PROJECT LOCATION

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

PROJECT NUMBER

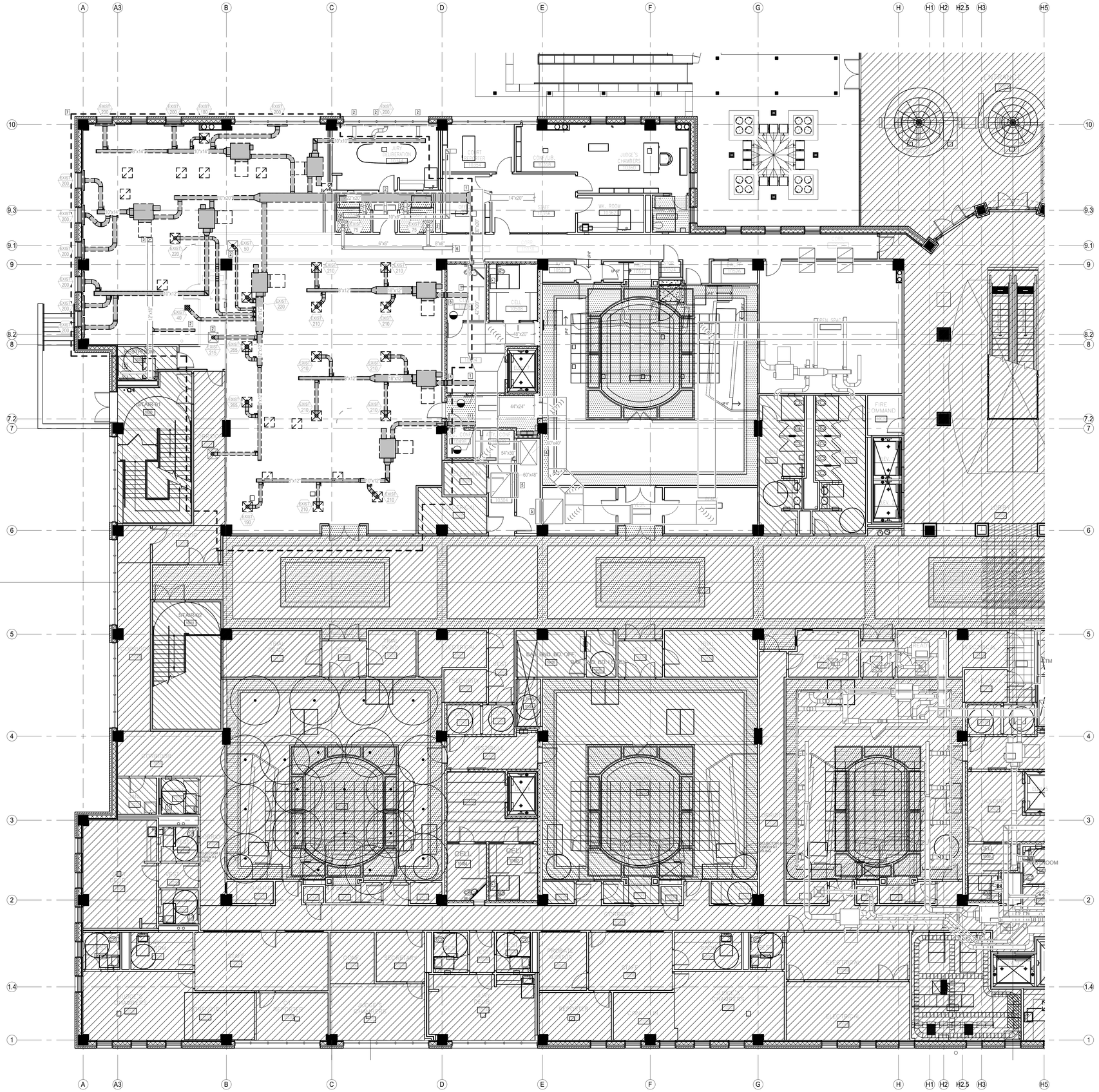
1007828.00

SHEET TITLE

MECHANICAL SYMBOL LEGEND

SHEET NUMBER

M0.01




## MECHANICAL KEYED NOTES

1. DEMOLISH BRANCH. CAP AND SEAL EXISTING MAIN DUCTWORK PENETRATION AIR-TIGHT.
2. EXISTING AIR DEVICE TO REMAIN.
3. EXISTING EXHAUST AIR SYSTEM UP TO EXISTING EF-2.
4. EXISTING SUPPLY AIR SYSTEM UP TO AHU-1.
5. EXISTING RETURN AIR SYSTEM UP TO AHU-1.
6. EXISTING EXHAUST AIR SYSTEM TO EXISTING EF-1
7. DASHED LINE INDICATES MECHANICAL SCOPE OF WORK.
8. PATCH WALL AND RESTORE TO FIRE RATING AT THE PENETRATION OF THE DEMOED DUCT THROUGH THE WALL.

## 2 MD2.11 LEVEL 1 PARTIAL DEMOLITION MECHANICAL PLAN A

1/8" = 1'-0"

TN PN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DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

**CLIENT**

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FORT BEND COUNTY

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**REGISTRATION**

REGISTERED ARCHITECT
MIKE L. ASHCRAFT
56590
LICENSED
10/17/2024

**DRAWING HISTORY**

| No | DATE | DESCRIPTION |
|---|---|---|
| | 05/01/2024 | 100% DESIGN DEVELOPMENT |
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTUCTION DOCUMENTS |
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

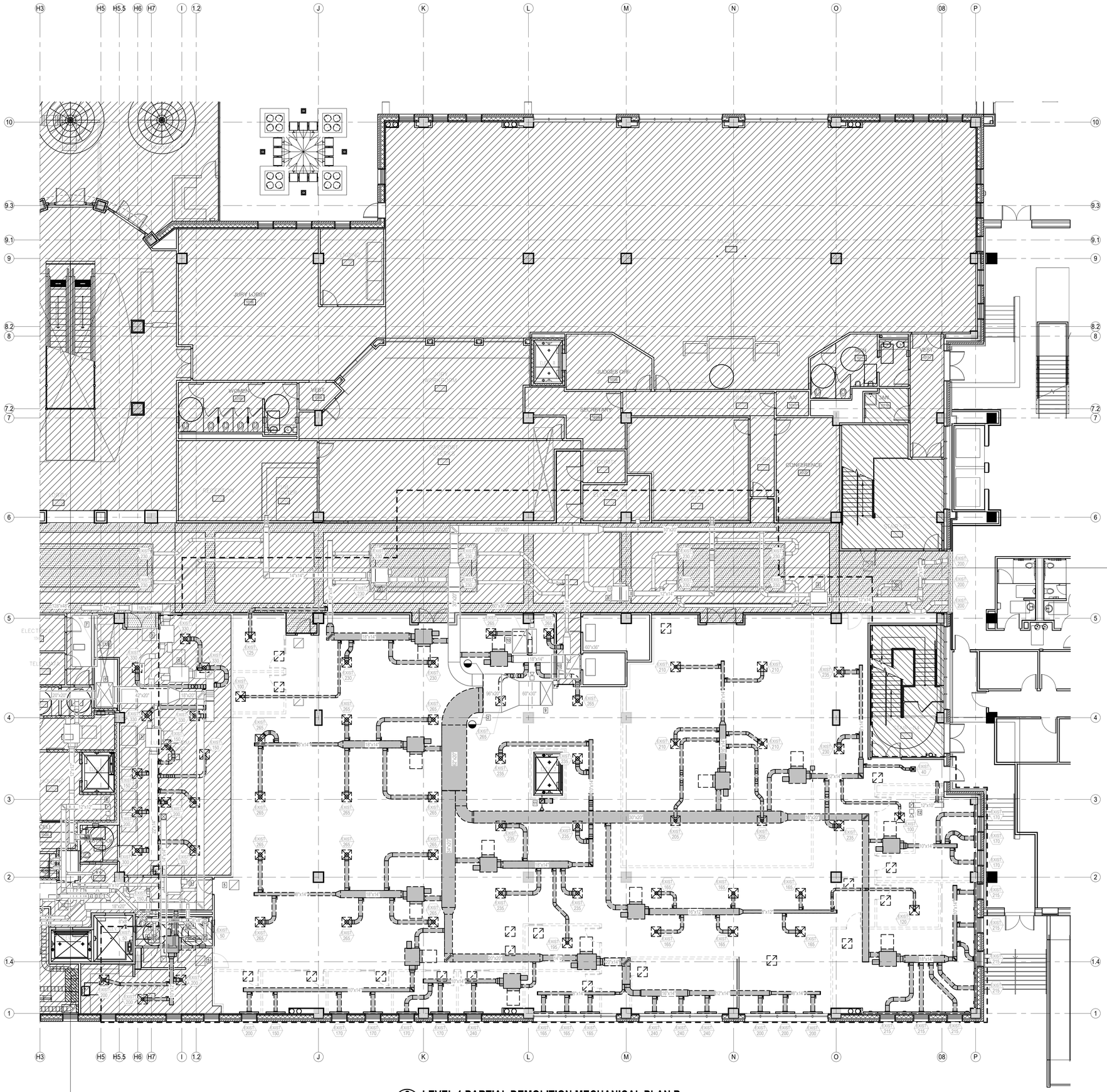
1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL DEMOLITION MECHANICAL PLAN A

**SHEET NUMBER**

MD2.11




## MECHANICAL KEYED NOTES

1. DEMOLISH BRANCH. CAP AND SEAL EXISTING MAIN DUCTWORK PENETRATION AIR-TIGHT.
2. DEMOLISH MAIN DUCTWORK TO POINT INDICATED.
3. EXISTING FAN POWERED TERMINAL UNIT TO REMAIN.
4. EXISTING AIR DEVICE TO REMAIN.
5. EXISTING RETURN AIR OPENING TO REMAIN.
6. EXISTING SUPPLY AIR SYSTEM UP TO EXISTING AHU-3.
7. EXISTING RETURN AIR SYSTEM UP TO EXISTING AHU-3.
8. EXISTING EXHAUST AIR SYSTEM UP TO EXISTING EF-10.
9. EXISTING SUPPLY AIR SYSTEM UP TO EXISITNG AHU -5.
10. EXISITNG RETURN AIR SYSTEM UP TO EXISTING AHU-5.
11. EXISTING EXHAUST AIR SYSTEM UP TO EXISTING EF-9.
12. EXISTING EXHAUST AIR SYSTEM UP TO EXISTING EF-8.

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## 2 LEVEL 1 PARTIAL DEMOLITION MECHANICAL PLAN B

MD2.12

1/8" = 1'-0"


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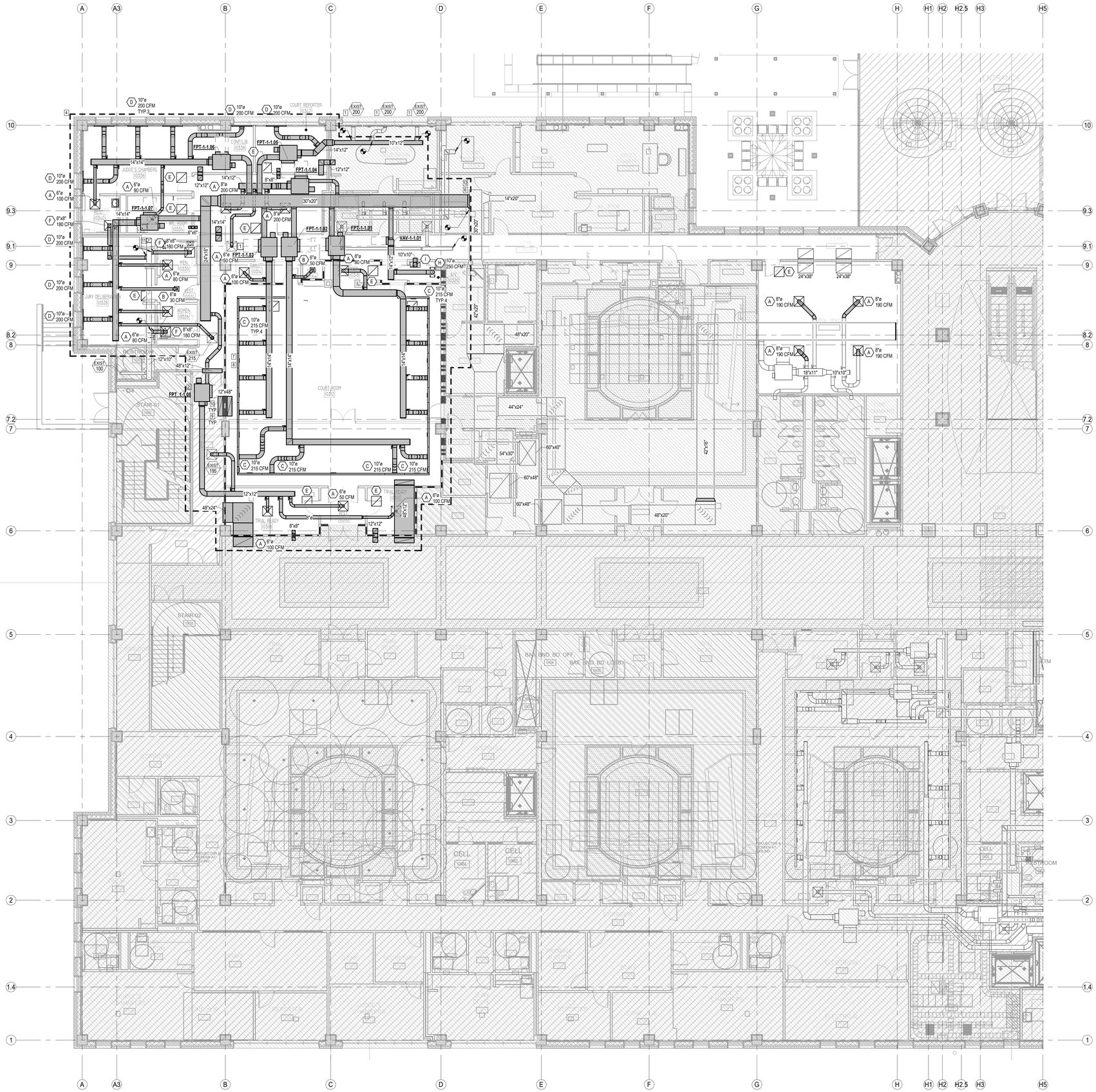
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D
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H2.5
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0052
JUDGE'S CHAMBERS
0036A
COURT REPORTER
0036B
CONF./LIB.
0035A
JURY DELIBER.
0028
MEN
0030
WOMEN
0026
TRIAL READY
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STAIR-01
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STAIR-02
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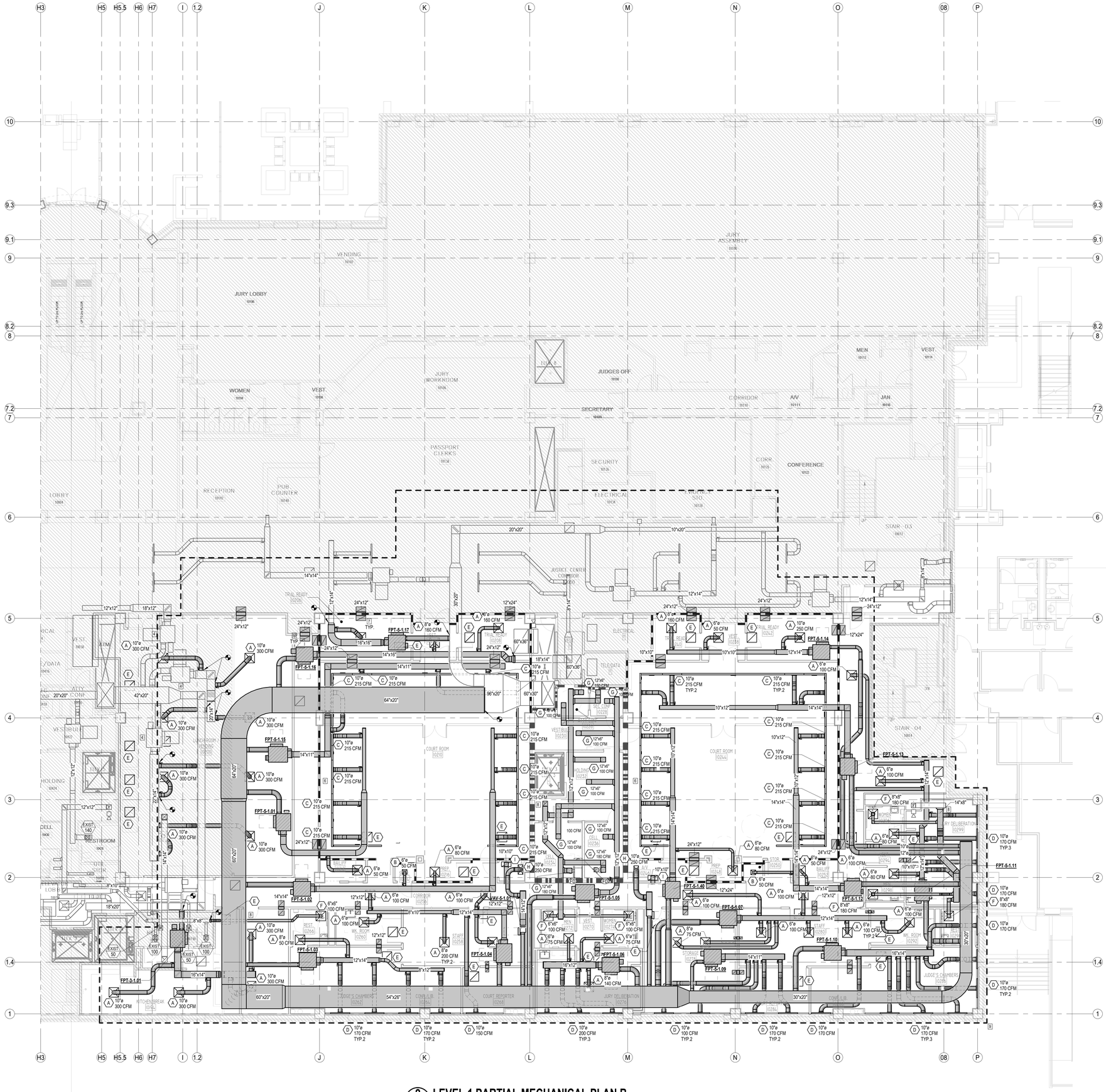


## 2 LEVEL 1 PARTIAL MECHANICAL PLAN B

M2.12

1/8" = 1'-0"

## MECHANICAL KEYED NOTES

1. RE-BALANCE TO CFM INDICATED
2. PROVIDE NEW FAN POWERED TERMINAL UNIT AS SCHEDULED. UNIT SHALL BE SUSPENDED FROM STRUCTURE ABOVE. PROVIDE VIBRATION ISOLATION PER SPECIFICATIONS. INSTALL PER MANUFACTURER'S WRITTEN INSTRUCTIONS ENSURING ALL CLEARANCES ARE MET. FIELD COORDINATE FINAL LOCATION WITH EXISTING CONDITIONS.
3. PROVIDE NEW AIR DEVICE AS SCHEDULED. IF SUPPLY, CONNECT TO MAIN AS SHOWN. BALANCE TO CFM INDICATED. FIELD COORDINATE FINAL ROUTING. TYPICAL ALL IN SCOPE UNLESS STATED OTHERWISE.
4. RE-BALANCE FAN POWERED TERMINAL UNIT TO CFM INDICATED.
5. CONNECT NEW MEDIUM PRESSURE SUPPLY DUCTWORK MAIN TO EXISTING SUPPLY DUCTWORK MAIN AS SHOWN. FIELD COORDINATE EXACT ROUTING.
6. PROVIDE CONTINUOUS SLOT AIR DEVICE AS SHOWN. PORTIONS OF SLOT NOT USED FOR SUPPLY SHALL BE LEFT OVER FOR RETURN AIR.
7. PROVIDE RETURN AIR BOOT AS SHOWN. SIZE AS INDICATED. TYPICAL ALL RETURN BOOTS.
8. CONNECT TO EXISTING EXHAUST DUCTWORK AS SHOWN. RE-BALANCE EXISTING AIR DEVICES TO CFM INDICATED.
9. DASHED LINE INDICATES MECHANICAL SCOPE OF WORK.
10. WHERE RETURN AIR PATHS ARE NEEDED IN WALLS TO STRUCTURE (TO ALLOW AIR FLOW BACK TO AIR HANDLING UNIT), PROVIDE RETURN AIR OPENING IN WALL ABOVE CEILING. SIZE OF OPENING SHALL BE LARGE ENOUGH SO THAT, AT PEAK TOTAL AIRFLOW, THE RETURN AIRFLOW THROUGH THE OPENING DOES NOT EXCEED 500 FPM VELOCITY. PROVIDE MULTIPLE OPENINGS IF NECESSARY.

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**PROJECT NUMBER**

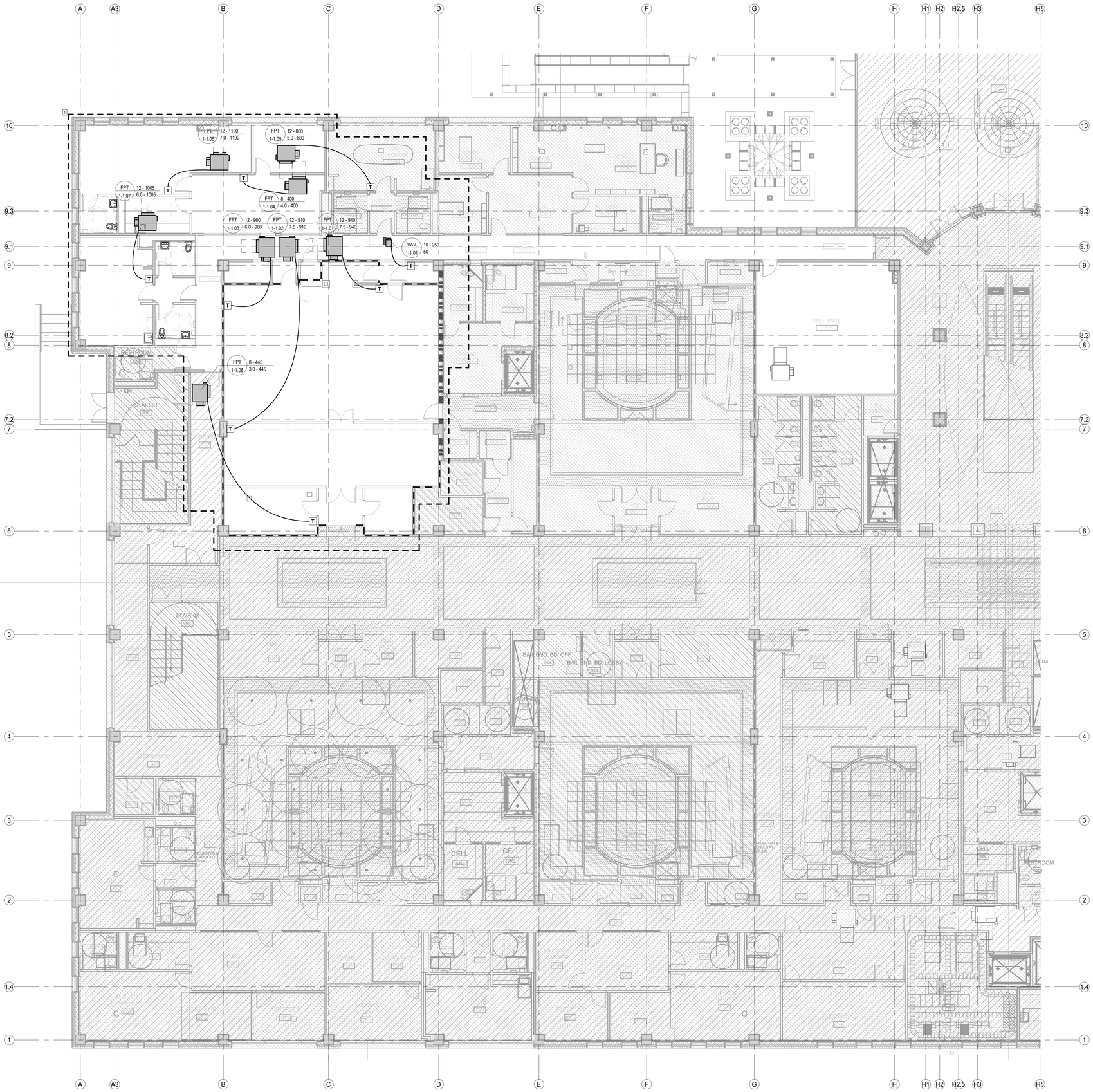
1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL MECHANICAL PLAN B

**SHEET NUMBER**

M2.12




## MECHANICAL KEYED NOTES

1. DASHED LINE INDICATES MECHANICAL SCOPE OF WORK.

1 M3.11 **LEVEL 1 PARTIAL MECHANICAL CONTROL PLAN A**

1/8" = 1'-0"

5 Cell & 6 Cell LEGEND Boundaries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LEVEL 1 PARTIAL MECHANICAL CONTROLS PLAN A

**SHEET NUMBER**

M3.11

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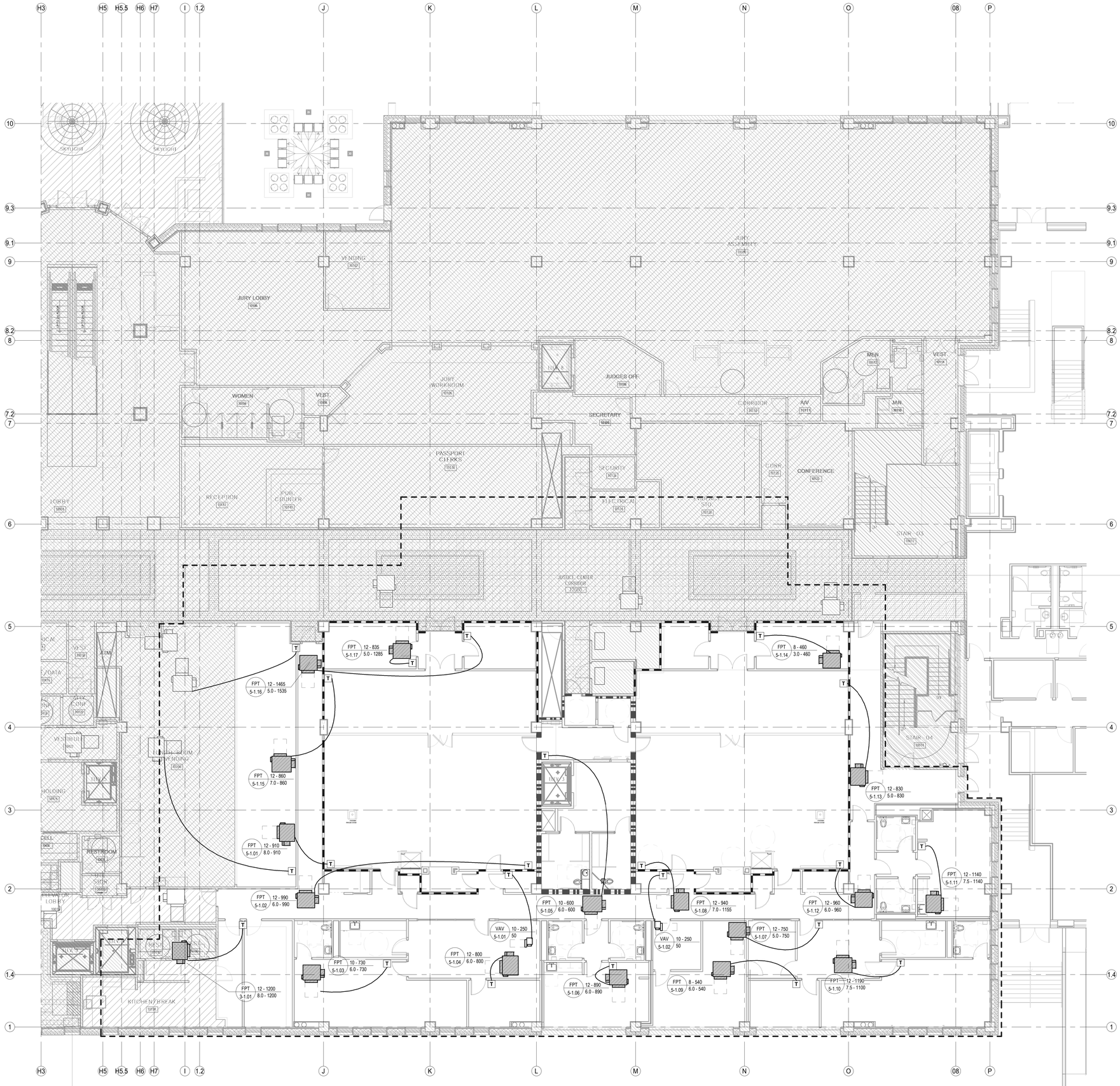


## 1 LEVEL 1 PARTIAL MECHANICAL CONTROL PLAN B

M3.12 1/8" = 1'-0"


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|---|---|---|---|---|

## EXISTING FAN SCHEDULE

| MARK | TEF-B1 | TEF-1 | TEF-2 | TEF-3 | TEF-4 | TEF-5 | TEF-6 | TEF-7 | TEF-8 | TEF-9 | TEF-10 | VF-B1 | VF-B2 | VF-B3 | VF-B4 | VF-B5 | VF-B6 | VF-B7 | VF-C1 | VF-C2 | VF-T1 | VF-T2 | KHEF-1 | SEF-1 | SEF-2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SERVICE | TOILET EXHAUST | TOILET EXHAUST | TOILET EXHAUST | TOILET EXHAUST | TOILET EXHAUST | TOILET EXHAUST | TOILET EXHAUST | TOILET EXHAUST | TOILET EXHAUST | TOILET EXHAUST | TOILET EXHAUST | VENTILATION | VENTILATION | VENTILATION | VENTILATION | VENTILATION | VENTILATION | SUPPLY | CHILLER ROOM | CHILLER ROOM | TUNNEL VENTILATION | TUNNEL VENTILATION | KITCHEN HOOD | SMOKE CONTROL | SMOKE CONTROL |
| UNIT TYPE | INLINE | ROOF CENTRIFUGAL | ROOF CENTRIFUGAL | ROOF CENTRIFUGAL | ROOF CENTRIFUGAL | ROOF CENTRIFUGAL | ROOF CENTRIFUGAL | ROOF CENTRIFUGAL | ROOF CENTRIFUGAL | ROOF CENTRIFUGAL | ROOF CENTRIFUGAL | WALL EXHAUST | WALL EXHAUST | WALL EXHAUST | WALL EXHAUST | WALL EXHAUST | INLINE | INLINE | ROOF CENTRIFUGAL | ROOF CENTRIFUGAL | WALL EXHAUST | WALL EXHAUST | ROOF CENTRIFUGAL | INLINE AXIAL | INLINE AXIAL |
| DRIVE TYPE | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | BELT | DIRECT | DIRECT |
| TOTAL AIRFLOW (CFM) | 3,500 | 3,000 | 1,200 | 1,800 | 1,500 | 1,800 | 1,700 | 1,700 | 900 | 1,800 | 1,600 | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 9,600 | 9,600 | 1,000 | 4,000 | 4,000 | 4,000 | 2,300 | 8,000 | 12,000 |
| FAN SPEED (RPM) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| EXTERNAL STATIC PRESSURE (IN. W.G.)* | 1.25 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 1.00 | 1.00 | 0.3 | 0.5 | 0.5 | 0.5 | 1.5 | 1.5 | 1.5 |
| MAXIMUM ACCEPTABLE SONES | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| MOTOR SIZE (HP) | 2 | 3/4 | 1/3 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/3 | 1/2 | 1/2 | 1/3 | 1/3 | 1/3 | 1/3 | 1/3 | 5 | 5 | 1/4 | 1.5 | 3/4 | 3/4 | 1 | 5 | 7.5 |
| VOLTS / PHASE | 460/3 | 460/3 | 120/1 | 120/1 | 120/1 | 120/1 | 120/1 | 120/1 | 120/1 | 120/1 | 120/1 | 120/1 | 120/1 | 120/1 | 120/1 | 120/1 | 460/3 | 460/3 | 120/1 | 460/3 | 460/3 | 460/3 | 460/3 | 460/3 | 460/3 |
| BASIS OF DESIGN | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK | GREENHECK |
| MODEL | BSQ-180HP | GB-180 | GB-121 | GB-141 | GB-141 | GB-141 | GB-141 | GB-141 | GB-121 | GB-141 | GB-141 | SE1-118 | SE1-118 | SE1-118 | SE1-118 | SE1-118 | BSQ-240 | BSQ-240 | GB-101 | GB-180 | SBE-3H24-7 | SBE-3H24-7 | CUBE-180HP | AX-63-190-0830-A5 | AX-72-190-0623-A7.5 |
| ACCESSORIES | MD,DS,CG | BS,BD,DS,MG | BS,BD,DS,MG | BS,BD,DS,MG | BS,BD,DS,MG | BS,BD,DS,MG | BS,BD,DS,MG | BS,BD,DS,MG | BS,BD,DS,MG | BS,BD,DS,MG | BS,BD,DS,MG | BD,DS,MG,WG | BD,DS,MG,WG | BD,DS,MG,WG | BD,DS,MG,WG | BD,DS,MG,WG | MD,DS,CG | MD,DS,CG | BS,BD,DS,MG | BS,BD,DS,MG | BD,DS,MG,WC,WH | BD,DS,MG,WC,WH | DS,RC,VCE,GT | - | - |
| NOTES | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 4 | 1 | 2 | - | - | 3 | 5,6 | 5,6 |

1- FAN SHALL RUN ALL THE TIME.
2- CONTROLLED BY REFRIGERANT MONITORING SYSTEM.
3- FAN SHALL BE UL LISTED FOR GREASE REMOVAL.
4- FAN SHALL BE INTERLOCKED WITH VF-B6.
5- ON EMERGENCY POWER.
6- FAN SHALL HAVE UL LISTING FOR "POWER VENTILATORS FOR SMOKE CONTROL SYSTEMS."

TEF-TOILET EXHAUST FAN; VF-VENTILATION FAN; KHEF-KITCHEN HOOD EXHAUST FAN

* EXTERNAL STATIC PRESSURE CONSISTS OF DUCTWORK, AIR DEVICES, AND FILTERS.

ACCESSORIES
BS-BIRDSCREEN; BD-BACKDRAFT DAMPER; IS-INLET SCREEN;
MD-MOTORIZED DAMPER; DS-DISCONNECT SWITCH;
MG-MOTOR GUARD; RC-ROOF CURB;
WF-WASHABLE FILTERS XP-EXPLOSIONPROOF MOTOR;
WG-WALL HOUSING; CG-CEILING EXHAUST GRILLE; GT-GREASE TRAP AND DRAIN CONNECTION;
WC-WALL COLLAR; WH-WEATHER HOOD; VCE-VENTED CURB EXTENSION;
CG-MOTOR COVER AND BELT GUARD.

**8 M5.01 EXISTING FAN SCHEDULE**
NO SCALE

## EXISTING AIR COOLED CHILLER SCHEDULE

| MARK | CH-3 | |
|---|---|---|
| TYPE | AIR-COOLED | |
| CAPACITY (TONS) | 60 | |
| AMBIENT TEMPERATURE (°F) | 105 | |
| CHILLED WATER FLOW (GPM) | 120 | |
| CHILLED WATER TEMP. IN (°F) | 54 | |
| CHILLED WATER TEMP. OUT (°F) | 42 | |
| MAX. ALLOWABLE FOULING FACTOR | 0.0001 | |
| MAX. ALLOW. WTR PRESS. DROP (FT) | 10 | |
| TOTAL COMPRESSOR POWER (KW) | - | |
| TOTAL CONDENSER FAN POWER (KW) | - | |
| TOTAL UNIT POWER (KW) | - | |
| VOLTAGE/PHASE | 460/3 | |
| BASIS OF DESIGN | CARRIER | |
| MODEL NUMBER | 30RB070 | |
| NOTES | 1 | |
| REMARKS | NOTES<br>1. PROVIDE CHILLER WITH TWO FACTORY INSTALLED CHILLED WATER PUMPS (120 GPM AT 50' HEAD EACH)<br>ONE PUMP AS STANDBY. | |

**6 M5.01 EXISTING AIR COOLED CHILLER SCHEDULE**
NO SCALE

## EXISTING PUMP SCHEDULE

| MARK | CHWP-1 | CHWP-2 | CHWP-3 | CWP-1 | CWP-2 | CWP-3 |
|---|---|---|---|---|---|---|
| SERVICE | CHILLED WATER | CHILLED WATER | CHILLED WATER | CONDENSER WATER | CONDENSER WATER | CONDENSER WATER |
| TYPE | END SUCTION | END SUCTION | END SUCTION | END SUCTION | END SUCTION | END SUCTION |
| GPM | 950 | 950 | 950 | 1,425 | 1,425 | 1,425 |
| HEAD (FT) | 95 | 95 | 95 | 60 | 60 | 60 |
| WATER TEMPERATURE (°F) | 50 | 50 | 50 | 90 | 90 | 90 |
| MINIMUM EFFICIENCY (%) | 88 | 88 | 88 | 84 | 84 | 84 |
| RPM | 1750 | 1750 | 1750 | 1750 | 1750 | 1750 |
| HP | 40 | 40 | 40 | 30 | 30 | 30 |
| VOLTAGE/PHASE | 460/3 | 460/3 | 460/3 | 460/3 | 460/3 | 460/3 |
| AURORA MODEL NO. | 344-5x6x11 | 344-5x6x11 | 344-5x6x11 | 344-6x6x11 | 344-6x6x11 | 344-6x6x11 |
| NOTES | (1)(3) | (1)(3) | (1)(3) | (2) | (2) | (2) |

NOTES
(1) PROVIDE PUMP WITH INVERTER DUTY MOTOR.
(2) PROVIDE PUMP WITH PREMIUM EFFICIENCY MOTOR.
(3) PROVIDE PUMP WITH VFD.

**5 M5.01 EXISTING PUMP SCHEDULE**
NO SCALE

## EXISTING COOLING TOWER SCHEDULE

| MARK | | CT-1 | CT-2 |
|---|---|---|---|
| GPM | | 1,425 | 1,425 |
| WATER TEMP. (°F) | IN | 96 | 96 |
| | OUT | 86 | 86 |
| FAN | HP | 30 | 30 |
| | VOLTAGE/PHASE | 480/3 | 480/3 |
| EVAPCO MODEL NO. | | USS-210-736 | USS-210-736 |
| NOTES | | (1)(2)(3) | (1)(2)(3) |

REMARKS
1. DESIGN WET BULB TEMP. : 80°F.
2. MAX. PRESSURE DROP, STATIC AND PIPING LOSS, SHALL NOT EXCEED 20'.

NOTES
(1) INVERTER DUTY MOTOR SHALL BE OPERATED WITH A VARIABLE SPEED DRIVE.
(2) LADDERS SHALL EXTEND FROM PLATFORM DOWN TO GRADE.
(3) PROVIDE TOWER WITH SIDE INLET CONNECTION, INTERNAL PIPING, BOTTOM EQUALIZE LINE CONNECTION, DRAIN CONNECTION, OVERFLOW CONNECTION, VELOCITY RECOVERY STACK, LOW SOUND FAN, SUPPLY SUMP WITH STRAINER, AND VORTEX BREAKER.

**4 M5.01 EXISTING COOLING TOWER SCHEDULE**
NO SCALE

## EXISTING WATER COOLED CHILLER SCHEDULE

| MARK | | CH-1 | CH-2 |
|---|---|---|---|
| TYPE | | WATER-COOLED CENTRIFUGAL | WATER-COOLED CENTRIFUGAL |
| CAPACITY (TONS) EACH | | 475 | 475 |
| CHILLED WATER FLOW (GPM) EACH | | 950 | 950 |
| CHILLED WATER TEMP. IN (°F) | | 56 | 56 |
| CHILLED WATER TEMP. OUT (°F) | | 44 | 44 |
| CONDENSER WATER FLOW (GPM) EACH | | 1,425 | 1,425 |
| CONDENSER WATER TEMP. IN (°F) | | 86 | 86 |
| CONDENSER WATER TEMP. OUT (°F) | | 96 | 96 |
| NUMBER OF PASSES | EVAPORATOR | 2 | 2 |
| | CONDENSER | 2 | 2 |
| FOULING FACTOR | EVAPORATOR | 0.0001 | 0.0001 |
| | CONDENSER | 0.0005 | 0.0005 |
| MAX. ALLOWABLE WATER PD (FT) | EVAPORATOR | 16 | 16 |
| | CONDENSER | 20 | 20 |
| MAXIMUM KW/TON AT FULL LOAD | | 0.582 | 0.582 |
| MINIMUM C.O.P. | | COMPLY WITH I.E.C.C. | COMPLY WITH I.E.C.C. |
| MINIMUM I.P.L.V. | | COMPLY WITH I.E.C.C. | COMPLY WITH I.E.C.C. |
| CARRIER MODEL NO. | | 19XRV4647385KFH64 | 19XRV4647385KFH64 |
| VOLTAGE/PHASE | | 460/3 | 460/3 |
| NOTES: | | (1) | (1) |

NOTES
(1) PROVIDE INTERFACE FROM CHILLER CONTROL PANEL TO DDC CONTROL SYSTEM.

**3 M5.01 EXISTING WATER COOLED CHILLER SCHEDULE**
NO SCALE

## EXISTING AIR HANDLING UNIT SCHEDULE

| UNIT TAG | AHU-6 |
|---|---|
| SUPPLY CFM | 2520 |
| O/A CFM | 300 |
| GTH (BTUH) | 77,900 |
| SH (BTUH) | 61,900 |
| EAT (DB° /WB°) | 76.7 / 63.7 |
| LAT (DB° /WB°) | 54 / 53 |
| FLOW GPM | 13.0 |
| E.S.P. (in.w.g.) | 1.0 |
| HORSEPOWER | 1.5 |
| VOLTS /PHASE | 460 / 3 |
| MAX FACE VELOCITY | 500 |
| MAKE /MODEL: | YORK SIAH33YAS |
| CONFIGURATION | HDT |
| SERVES | BASEMENT |
| NOTES | (1) |

KEYED NOTES:
(1) COMBINATION MOTOR STARTER BY ELECTRICAL CONTRACTOR.

**1 M5.01 EXISTING AIR HANDLING UNIT SCHEDULE**
NO SCALE

## EXISTING AIR HANDLING UNIT SCHEDULE

| MARK | | AHU-1 | AHU-2 | AHU-3 | AHU-4 | AHU-5 | OAHU-1 | OAHU-2 |
|---|---|---|---|---|---|---|---|---|
| FAN | CFM, QTY | 25,000/2 | 25,000/2 | 25,000/2 | 25,000/2 | 25,000/2 | 30,000/1 | 20,000/1 |
| | EXTERNAL STATIC PRESS. (IN W.G.) | 2.75 | 2.75 | 2.75 | 2.75 | 2.75 | 0.75 | 0.75 |
| | OUTSIDE AIR, CFM | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 | 30,000 | 20,000 |
| PREHEAT | CFM | | | | | | 30,000 | 30,000 |
| | EAT / LAT °F DB | | | | | | 20/51.6 | 20/51.6 |
| | COIL TOTAL (BTUH) | | | | | | 1,023,900 | 682,600 |
| | KW/STEPS | | | | | | 300/3 | 200/2 |
| | VOLT/PH | | | | | | 480/3 | 480/3 |
| COOLING | CFM | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 30,000 | 20,000 |
| | ENTERING AIR D.B./W.B. (°F) | 70.2/61.5 | 70.2/61.5 | 70.2/61.5 | 70.2/61.5 | 70.2/61.5 | 95/80 | 95/80 |
| | LEAVING AIR D.B./W.B. (°F) | 51/50.5 | 51/50.5 | 51/50.5 | 51/50.5 | 51/50.5 | 51/50.5 | 51/50.5 |
| | COIL SENSIBLE (BTUH) | 1,036,800 | 1,036,800 | 1,036,800 | 1,036,800 | 1,036,800 | 1,425,600 | 950,400 |
| | COIL TOTAL (BTUH) | 1,530,800 | 1,530,800 | 1,530,800 | 1,530,800 | 1,530,800 | 3,062,490 | 2,041,660 |
| | COIL FLOW (GPM/MAX. PD - FEET WATER) | 255/20 | 255/20 | 255/20 | 255/20 | 255/20 | 510/20 | 340/20 |
| | PIPE SIZE (INCHES) | 4 | 4 | 4 | 4 | 4 | 6 | 6 |
| | EWT/TEMPERATURE RISE (°F) | 44/12 | 44/12 | 44/12 | 44/12 | 44/12 | 44/12 | 44/12 |
| | MAX. COIL FACE VELOCITY (FPM) | 475 | 475 | 475 | 475 | 475 | 425 | 425 |
| SYSTEM TYPE | | DT, VAV | DT, VAV | DT, VAV | DT, VAV | DT, VAV | DT, VAV | DT, VAV |
| FAN MOTOR HORSEPOWER | | (2)-30 | (2)-30 | (2)-30 | (2)-30 | (2)-30 | (1)-30 | (1)-30 |
| VOLT/PH | | 460/3 | 460/3 | 460/3 | 460/3 | 460/3 | 460/3 | 460/3 |
| FAN TYPE | | PLENUM FAN | PLENUM FAN | PLENUM FAN | PLENUM FAN | PLENUM FAN | PLENUM FAN | PLENUM FAN |
| BASIS OF DESIGN | | TEMTROL | TEMTROL | TEMTROL | TEMTROL | TEMTROL | TEMTROL | TEMTROL |
| NOTES | | 1,2,3,5 | 1,2,3,5 | 1,2,3,5 | 1,2,3,5 | 1,2,3,5 | 1,2,4,5 | 1,2,4,5 |

REMARKS
1. EXT. STATIC PRESSURE INCLUDES FILTER BUILT-UP, DUCTWORK, AND ACCESSORY LOSSES.
2. UNIT CASING SHALL BE DOUBLE WALL CONSTRUCTION.
3. CHILLED WATER COILS: 6 ROW MIN., 10 FINS/INCH MAX.

NOTES
1. PROVIDE UNIT WITH LIGHTS AND VARIABLE FREQUENCY DRIVE MOUNTED IN UNIT HOUSING.
2. PROVIDE SMOKE DETECTORS IN SUPPLY AIR DUCTS.
3. UNIT SHALL CONSIST OF MOTORIZED DAMPER SECTION, MIXING BOX SECTION, PRE-FILTER SECTION, FINAL FILTER SECTION, COOLING COIL SECTION, FAN SECTION AND SUPPLY AIR PLENUM SECTION WITH MOTORIZED DAMPERS.
4. UNIT SHALL CONSIST OF MOTORIZED DAMPER SECTION, PRE-FILTER SECTION, FINAL FILTER SECTION, PRE-HEAT COIL SECTION, FAN SECTION, AND SUPPLY AIR PLENUM SECTION.
5. PROVIDE UV LIGHTS FOR CHILLED WATER COIL SECTION.

**2 M5.01 EXISTING AIR HANDLING UNIT SCHEDULE #2**
NO SCALE

## EXISTING EXPANSION TANK SCHEDULE

| MARK | ET-1 | |
|---|---|---|
| TYPE | ASME BLADDER | |
| SERVICE | CHILLED WATER SYSTEM | |
| OPERATING PRESSURE (PSIG) | 125 | |
| TANK ACCEPTANCE VOLUME (GALLONS) | 79 | |
| NOTES | (1)(2) | |

NOTES
(1) PROVIDED WITH CHARGING VALVE AND PRESSURE GAUGE.
(2) TANK PRECHARGE: 22 PSI
PRV VALVE SETTING: 25 PSI
RELIEF VALVE SETTING: 75 PSI

**7 M5.01 EXISTING EXPANSION TANK SCHEDULE**
NO SCALE

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56590
LICENSED
PROFESSIONAL ENGINEER
10/17/2024

DRAWING HISTORY

| № | DATE | DESCRIPTION |
|---|---|---|
| | 05/01/2024 | 100% DESIGN DEVELOPMENT |
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTUCTION DOCUMENTS |
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

PROJECT NAME
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

PROJECT LOCATION
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

PROJECT NUMBER
1007828.00

SHEET TITLE
MECHANICAL SCHEDULES

SHEET NUMBER
M5.01

# AIR DEVICE SCHEDULE

| MARK | MFR. & MODEL | TYPE | REMARKS |
|---|---|---|---|
| A | KRUEGER<br>SSHR | 24"x24" SQUARE FACE<br>SUPPLY AIR DIFFUSER | ALUMINUM CONSTRUCTION WITH FRAME FOR LAY-IN CEILING OR HARD CEILING. |
| B | KRUEGER<br>SSHR | 12"x12" SQUARE FACE<br>SUPPLY AIR DIFFUSER | ALUMINUM CONSTRUCTION WITH FRAME FOR LAY-IN CEILING OR HARD CEILING. |
| C | KRUEGER<br>1900 | LINEAR<br>SLOT DIFFUSER | 4'-0" LONG, WITH 3 SLOTS, 1" WIDE, CONCEALED MOUNTING FLANGE BORDER AND PLENUM, LENGTH AS INDICATED ON PLAN. |
| D | KRUEGER<br>PTBSC | LINEAR<br>SLOT DIFFUSER | 4'-0" LONG, WITH 1 SLOT, 3/4" WIDE, CONCEALED MOUNTING FLANGE AND PLENUM, LENGTH AS INDICATED ON PLAN. |
| E | KRUEGER<br>56490 | 24"X24" FACE<br>RETURN AIR DIFFUSER | PERFORATED FACE, ALUMINUM CONSTRUCTION WITH FRAME FOR LAY-IN CEILING. PROVIDE 22"x22" NECK UNLESS OTHERWISE NOTED. PROVIDE O.B.D. FOR DUCTED EXHAUST. |
| F | KRUEGER<br>EGC5-AL | 24"x24" EGGCRATE<br>RETURN / EXHAUST GRILLE | ALUMINUM CONSTRUCTION WITH FRAME FOR HARD CEILING. PROVIDE 22"x22" NECK OPEN TO PLENUM UNLESS OTHERWISE NOTED ON DRAWINGS. PROVIDE O.B.D. WHEN USED FOR DUCTED EXHAUST OR RETURN. |
| G | KRUEGER<br>1310 | MAXIMUM SECURITY GRILLE<br>WITH ROUNDED PERFORATIONS | WELDED STEEL CONSTRUCTION WITH FRAME FOR HARD CEILING. PROVIDE FACE OPERATED O.B.D. PROVIDE WITH SECURITY BARS. PROVIDE STEEL SLEEVE. |
| H | KRUEGER<br>SSHR | 24"x12" FACE<br>SUPPLY AIR DIFFUSER | ALUMINUM CONSTRUCTION WITH FRAME FOR LAY-IN CEILING OR HARD CEILING. |
| I | KRUEGER<br>56490 | 24"X12" FACE<br>RETURN AIR DIFFUSER | PERFORATED FACE, ALUMINUM FACE WITH STEEL BACKPAN CONSTRUCTION. |

NOTES:
1. REFER TO ARCHITECTURAL DRAWINGS FOR FINISH.
2. REFER TO MECHANICAL FLOOR PLAN FOR NECK SIZES.
3. PROVIDE FRAME TO MATCH CEILING TYPE INDICATED ON ARCHITECT'S REFLECTED CEILING PLAN.

# VAV TERMINAL UNIT SCHEDULE COOLING ONLY

| TYPE | MARK | INLET SIZE | MAX S.P.D IN. W.G. | AIRFLOW COOLING CFM | MANUFACTURER |
|---|---|---|---|---|---|
| VAV | 1-1.01 | 10 | 0.12 | 1100 | KRUEGER |
| VAV | 5-1.01 | 10 | 0.12 | 1100 | KRUEGER |
| VAV | 5-1.02 | 10 | 0.12 | 1100 | KRUEGER |

# FAN POWERED SERIES TERMINAL UNIT SCHEDULE

| TYPE | MARK | INLET SIZE | MAX S.P.D. IN. W.G. | AIRFLOW COOLING CFM | TOTAL AIRFLOW | ELECTRIC REHEAT COIL | | | | MANUFACTURER / MODEL | REMARKS / NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | MAX HP | VOLTS/PH | HEATING COIL VOLTS | kW | | |
| FPT | 1-1.01 | 12 | 0.12 | 940 | 940 | 1/2 | 277/1 | 480 V | 7.5 kW | KRUEGER KFSS-4 | ALL |
| FPT | 1-1.02 | 12 | 0.12 | 910 | 910 | 1/2 | 277/1 | 480 V | 7.5 kW | KRUEGER KFSS-4 | ALL |
| FPT | 1-1.03 | 12 | 0.12 | 960 | 960 | 1/2 | 277/1 | 480 V | 6.0 kW | KRUEGER KFSS-4 | ALL |
| FPT | 1-1.04 | 8 | 0.12 | 400 | 400 | 1/3 | 277/1 | 480 V | 4.0 kW | KRUEGER KFSS-3 | ALL |
| FPT | 1-1.05 | 12 | 0.12 | 800 | 800 | 1/2 | 277/1 | 480 V | 5.0 kW | KRUEGER KFSS-5 | ALL |
| FPT | 1-1.06 | 12 | 0.12 | 1190 | 1190 | 1/2 | 277/1 | 480 V | 7.0 kW | KRUEGER KFSS-5 | ALL |
| FPT | 1-1.07 | 12 | 0.12 | 1005 | 1005 | 1/2 | 277/1 | 480 V | 6.0 kW | KRUEGER KFSS-5 | ALL |
| FPT | 1-1.08 | 8 | 0.12 | 445 | 445 | 1/3 | 277/1 | 480 V | 3.0 kW | KRUEGER KFSS-3 | ALL |
| FPT | 3-1.01 | 12 | 0.12 | 1200 | 1200 | 1/2 | 277/1 | 480 V | 8.0 kW | KRUEGER KFSS-5 | ALL |
| FPT | 5-1.01 | 12 | 0.12 | 910 | 910 | 1/2 | 277/1 | 480 V | 8.0 kW | KRUEGER KFSS-5 | ALL |
| FPT | 5-1.02 | 12 | 0.12 | 990 | 990 | 1/2 | 277/1 | 480 V | 6.0 kW | KRUEGER KFSS-5 | ALL |
| FPT | 5-1.03 | 10 | 0.12 | 730 | 730 | 1/3 | 277/1 | 480 V | 6.0 kW | KRUEGER KFSS-3 | ALL |
| FPT | 5-1.04 | 12 | 0.12 | 800 | 800 | 1/2 | 277/1 | 480 V | 6.0 kW | KRUEGER KFSS-4 | ALL |
| FPT | 5-1.05 | 10 | 0.12 | 600 | 600 | 1/3 | 277/1 | 480 V | 6.0 kW | KRUEGER KFSS-4 | ALL |
| FPT | 5-1.06 | 12 | 0.12 | 890 | 890 | 1/2 | 277/1 | 480 V | 6.0 kW | KRUEGER KFSS-5 | ALL |
| FPT | 5-1.07 | 12 | 0.12 | 750 | 750 | 1/2 | 277/1 | 480 V | 5.0 kW | KRUEGER KFSS-5 | ALL |
| FPT | 5-1.08 | 12 | 0.12 | 940 | 1155 | 1/2 | 277/1 | 480 V | 7.0 kW | KRUEGER KFSS-5 | ALL |
| FPT | 5-1.09 | 8 | 0.12 | 540 | 540 | 1/3 | 277/1 | 480 V | 6.0 kW | KRUEGER KFSS-3 | ALL |
| FPT | 5-1.10 | 12 | 0.12 | 1190 | 1100 | 1/2 | 277/1 | 480 V | 7.5 kW | KRUEGER KFSS-5 | ALL |
| FPT | 5-1.11 | 12 | 0.12 | 1140 | 1140 | 1/2 | 277/1 | 480 V | 7.5 kW | KRUEGER KFSS-5 | ALL |
| FPT | 5-1.12 | 12 | 0.12 | 960 | 960 | 1/2 | 277/1 | 480 V | 6.0 kW | KRUEGER KFSS-5 | ALL |
| FPT | 5-1.13 | 12 | 0.12 | 830 | 830 | 1/2 | 277/1 | 480 V | 5.0 kW | KRUEGER KFSS-5 | ALL |
| FPT | 5-1.14 | 8 | 0.12 | 460 | 460 | 1/3 | 277/1 | 480 V | 3.0 kW | KRUEGER KFSS-3 | ALL |
| FPT | 5-1.15 | 12 | 0.12 | 860 | 860 | 1/2 | 277/1 | 480 V | 7.0 kW | KRUEGER KFSS-4 | ALL |
| FPT | 5-1.16 | 12 | 0.12 | 1465 | 1535 | 1/2 | 277/1 | 480 V | 5.0 kW | KRUEGER KFSS-5 | ALL |
| FPT | 5-1.17 | 12 | 0.12 | 835 | 1285 | 1/2 | 277/1 | 480 V | 5.0 kW | KRUEGER KFSS-5 | ALL |

NOTES:

(1) PROVIDE A FACTORY-MOUNTED UNITARY DDC CONTROLLER TO EFFECT PRESSURE INDEPENDENT SPACE TEMPERATURE CONTROL. CONTROLLER MANUFACTURER AND MODEL SHALL BE THE SAME AS THE BASE BUILDING. NO SUBSTITUTIONS ALLOWED. UPON INCREASE IN SPACE TEMPERATURE ABOVE SETPOINT, MODULATE CONTROL VALVE OPEN FROM MINIMUM TO MAXIMUM AIRFLOW. UPON DECREASE IN SPACE TEMPERATURE BELOW SETPOINT, MODULATE CONTROL VALVE TO MINIMUM POSITION. ENERGIZE FAN AND ELECTRIC HEATING COIL IN SEQUENCE TO MAINTAIN SETPOINT.

(2) CONNECT THE VAV TERMINAL UNIT UNITARY CONTROLLER TO THE BUILDING BAS.

(3) PROVIDE UNIT WITH THE FOLLOWING FEATURES: 1" FIBERGLASS LINER; PRIMARY AIRFLOW SENSOR; INDUCED AIR FILTER 1" MERV 8 IN RETURN AIR INLET; FACTORY PROVIDED AND WIRED DOOR INTERLOCKING FUSED DISCONNECT SWITCH; SUPPLY AIR TEMPERATURE SENSOR; MAGNETIC CONTACTORS FOR HEATING COIL STAGING; FACTORY PROVIDED AND WIRED 277V/24V CONTROL VOLTAGE TRANSFORMER; AUTOMATIC RESET THERMAL SWITCH; AIRFLOW SWITCH; NEMA 1 ENCLOSURE; ELECTRIC DAMPER ACTUATOR.

(4) REFER TO PLANS FOR ACTUAL MAX COOLING CFM.

(5) PROVIDE A SPACE TEMPERATURE SENSOR. SENSOR MODEL AND MANUFACTURER SHALL BE THE SAME AS THE BASE BUILDING. NO SUBSTITUTIONS ALLOWED.

(6) PROVIDE FEATURES AND OPTIONS FOR THE TERMINAL UNIT, SPACE TEMPERATURE SENSOR, AND CONTROLLER THAT MATCH THE BASE BUILDING DESIGN. REFER TO THE APPROVED BASE BUILDING SUBMITTALS FOR EXACT REQUIREMENTS.

(7) PROVIDE THE SCHEDULED BOX MANUFACTURER AND MODEL. NO SUBSTITUTIONS ALLOWED.

KEY:

FPT X — FPT: SIZE - CFM; X: KW - HEATING CFM (FAN CFM)

X REPRESENTS THE ROOM SERVED / THERMOSTAT LOCATION

1 M5.02 **FAN POWERED TERMINAL UNIT ELECTRIC**

NO SCALE


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**CONSULTANT**

**REGISTRATION**

STATE OF TEXAS · MIKE L. ASHCRAFT · 56590 · LICENSED PROFESSIONAL ENGINEER

10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTUCTION DOCUMENTS |
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

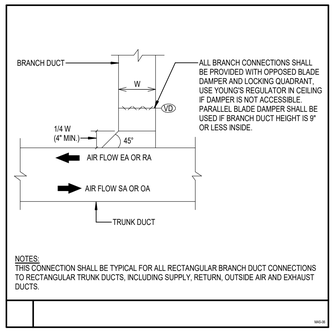
1007828.00

**SHEET TITLE**

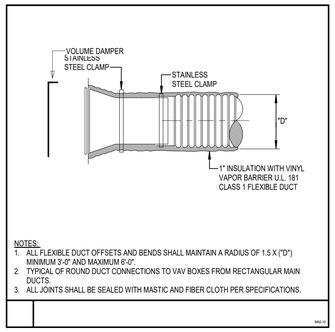
MECHANICAL SCHEDULES

**SHEET NUMBER**

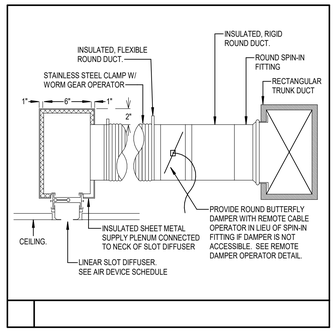
M5.02



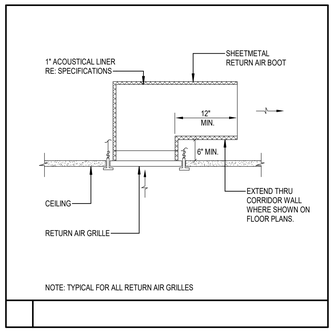

1 M6.01 **RECTANGULAR BRANCH DUCT TAP**
12" = 1'-0"




2 M6.01 **CONICAL SPIN-IN LOW PRESSURE DETAIL**
12" = 1'-0"




3 M6.01 **SLOT DIFFUSER CONNECTION**
12" = 1'-0"




4 M6.01 **RETURN AIR BOOT AT GRILLE**
12" = 1'-0"




5 M6.01 **RETURN AIR BOOT THRU WALL**
12" = 1'-0"




6 M6.01 **FIRE/SMOKE DAMPER DETAIL**
12" = 1'-0"




10 M6.01 **HVAC DUCT THROUGH WALL WITH SECURITY BARS DETAIL**
1/8" = 1'-0"




8 M6.01 **SERIES FAN POWERED TERMINAL UNIT**
1/8" = 1'-0"




9 M6.01 **CONICAL SPIN-IN MEDIUM PRESSURE DETAIL**
12" = 1'-0"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**PROJECT NAME**
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**
1007828.00

**SHEET TITLE**
MECHANICAL DETAILS

**SHEET NUMBER**
M6.01

# ABBREVIATIONS

| | |
|---|---|
| AC | ALTERNATING CURRENT |
| AF | AMPERE FUSE, AMPERE FRAME |
| AFC | ABOVE FINISHED CEILING |
| AFF | ABOVE FINISHED FLOOR |
| AFG | ABOVE FINISHED GRADE |
| AIC | AMPERE INTERRUPT CAPACITY |
| AL | ALUMINUM |
| AM | AMMETER |
| AMP | AMPLIFIER |
| ANN | ANNUNCIATOR |
| ASC | AMPERES SHORT CIRCUIT |
| AT | AMPERE TRIP RATING |
| ATS | AUTOMATIC TRANSFER SWITCH |
| AUX | AUXILIARY |
| BKR | BREAKER |
| BLDG. | BUILDING |
| C | CONDUIT, CELSIUS |
| CKT | CIRCUIT |
| CLG. | CEILING |
| CONT. | CONTINUOUS,CONTINUATION |
| CONTR | CONTROLLER, CONTRACTOR |
| CT | CURRENT TRANSFORMER/COOLING TOWER |
| CU | COPPER |
| DAS | DISTRIBUTED ANTENNA SYSTEM |
| DC | DIRECT CURRENT |
| DISC | DISCONNECT |
| DP | DISTRIBUTION PANEL |
| DPDT | DOUBLE-POLE, DOUBLE-THROW |
| DPST | DOUBLE-POLE, SINGLE-THROW |
| DWG | DRAWING |
| ELEV. | ELEVATOR |
| EPO | EMERGENCY POWER OFF |
| ERRC | EMERGENCY RESPONDER RADIO COVERAGE SYSTEM |
| FA | FIRE ALARM |
| FF | FURNITURE FEED |
| FLA | FULL LOAD AMPS |
| FTL | FEED-THRU LUGS |
| GA | GAUGE |
| GEN | GENERATOR |
| GND | GROUND |
| GTD | GENERATOR TRANSFER DEVICE |
| IG | ISOLATED GROUND |
| LF | LINEAR FEET |
| LTG | LIGHTING |
| LV | LOW VOLTAGE |
| LVL | LEVEL |
| MAX. | MAXIMUM |
| MC | METAL CLAD CABLE |
| MCA | MINIMUM CIRCUIT AMPS |
| MCB | MAIN CIRCUIT BREAKER |
| MCCB | MOLDED CASE CIRCUIT BREAKER |
| MD | MOTORIZED DAMPER |
| MDP | MAIN DISTRIBUTION PANEL |
| MFR | MANUFACTURER |
| MIC | MICROPHONE |
| MIN. | MINIMUM |
| MLO | MAIN LUGS ONLY |
| MOCP | MAXIMUM OVER-CURRENT PROTECTION |
| MSB | MAIN SWITCHBOARD |
| N3R | NEMA 3R |
| N4X | NEMA 4X |
| N.C. | NORMALLY CLOSED |
| NEC | NATIONAL ELECTRICAL CODE |
| NF | NON-FUSED |
| NFS | NON-FUSED SWITCH |
| NIC | NOT IN CONTRACT |
| NL | NIGHT LIGHT |
| N.O. | NORMALLY OPEN |
| NO. | NUMBER |
| NTS | NOT TO SCALE |
| PH | PHASE |
| POS | POINT OF SALE |
| QTY | QUANTITY |
| RCP | REFLECTED CEILING PLAN |
| RCPT | RECEPTACLE |
| RE | REFERENCE, REFER |
| SF | SQUARE FOOT |
| SIM | SIMILAR |
| SKVA | STARTING KILOVOLT-AMPS |
| SPD | SURGE PROTECTION DEVICE |
| SPDT | SINGLE-POLE, DOUBLE-THROW |
| SPST | SINGLE-POLE, SINGLE-THROW |
| SPEC | SPECIFICATION |
| SQFT | SQUARE FOOT |
| ST | SHUNT TRIP |
| SWB | SWITCHBOARD |
| TL | TWIST-LOCK |
| TOC | TOP OF CURB |
| TOS | TOP OF STEEL |
| TR | TAMPER RESISTANT RECEPTACLE |
| TV | TELEVISION |
| TYP | TYPICAL |
| UG | UNDERGROUND |
| UNO | UNLESS NOTED OTHERWISE |
| UPS | UNINTERRUPTIBLE POWER SYSTEM |
| VFD | VARIABLE FREQUENCY DRIVE |
| WP | WEATHERPROOF |
| WT | WATERTIGHT, WEIGHT |
| W/SF | WATTS PER SQUARE FOOT |
| XFMR | TRANSFORMER |

MANY ABBREVIATIONS NOT LISTED MAY BE FOUND IN THE NATIONAL ELECTRIC CODE, OR IN THE INTERNATIONAL AND UNIFORM CODES

# PHASING

| | |
|---|---|
| (E) | EXISTING (TO REMAIN) |
| (D) | SHALL BE DEMOLISHED |
| (N) | PROVIDE NEW |
| (R) | RELOCATED ELEMENT |

# ELECTRICAL SYMBOLS

## MOTORS AND CONTROLS

- MOTOR RATED SWITCH WITH THERMAL OVERLOADS
- SINGLE OR THREE PHASE MOTOR NUMBER INDICATES HORSE POWER
- ELECTRIC DUCT HEATER
- DISCONNECT (SAFETY) SWITCH "200/3/150" DENOTES AMPERES/POLE/FUSE, "NF" DENOTES NON-FUSED "N3R" DENOTES NEMA 3R
- ENCLOSED CIRCUIT BREAKER- "200/3/150" DENOTES AMPERES/POLE/TRIP.
- MOTOR STARTER FURNISHED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- COMBINATION DISCONNECT (SAFETY) SWITCH AND MOTOR STARTER. "30/3/15/#0" DENOTES AMPERES/POLES/FUSE/ STARTER SIZE. "NF" DENOTES NON-FUSED. FURNISHED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- VFD — VARIABLE FREQUENCY DRIVE PROVIDED BY DIVISION 23 AND INSTALLED BY DIVISION 26.
- EPO — EMERGENCY POWER OFF BUTTON.

## RECEPTACLES AND OUTLETS

ALL RECEPTACLES SHALL BE MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER OF DEVICE UNLESS NOTED OTHERWISE. REFER TO SPECIFICATIONS AND DRAWINGS FOR ADDITIONAL REQUIREMENTS.

ABBREVIATIONS APPLICABLE TO RECEPTACLES:

"GFCI" GROUND FAULT INTERRUPTER
"WP" WEATHERPROOF
"IG" ISOLATED GROUND
"TR" TAMPER RESISTANT
"USB" RECEPTACLE WITH USB CHARGING PORTS
"AC" ABOVE COUNTER MOUNTING
"UC" UNDER COUNTER MOUNTING
"H" HORIZONTALLY ORIENTED RECEPTACLE

- SIMPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V.
- DUPLEX WALL RECEPTACLE, NEMA 5-20R, 20A, 125V. SHADED INDICATES SPLIT-WIRED
- FOURPLEX (QUADRUPLEX) RECEPTACLE
- DUPLEX RECEPTACLE (PEDESTAL MOUNTED)
- CONTROLLED WALL RECEPTACLE. DUPLEX: SPLIT-WIRED QUAD: SEPARATELY WIRED UNDER A COMMON COVERPLATE.
- POWER DEVICE RED IN COLOR, ON EMERGENCY POWER CIRCUIT
- CEILING RECEPTACLE/QUAD, EMERGENCY POWER SYMBOL MAY APPLY
- SPECIAL RECEPTACLE, NEMA CONFIGURATION PER PLAN OR EQUIPMENT
- TV — TV ROUGH-IN: 3-GANG RECESSED TV BOX, CONTAINING 1 DUPLEX RECEPTACLE, 1 GANG FOR AV, 1 GANG FOR DATA
- FLOOR BOX OR POKE THRU. POKE-THRU'S WHERE IN SUSPENDED SLABS, RECESSED IN FOUNDATION WHERE SLAB ON GRADE
- FLUSH ELECTRICAL FLOOR OUTLET. REFER TO FLOOR BOX SCHEDULE, FIRE RATED POKE-THROUGH SCHEDULE AND KEYED NOTES.
- DC — DROP CORD WITH SIMPLEX RECEPTACLE UNLESS OTHERWISE NOTED
- CR — CORD REEL WITH DUPLEX RECEPTACLE UNLESS OTHERWISE NOTED
- J — JUNCTION BOX "MD" INDICATES POWER CONNECTION TO SERVE MOTOR DAMPER "HD" INDICATES POWER CONNECTION TO SERVE HAND DRYER "FV" INDICATES POWER CONNECTION TO SERVE FLUSH VALVES
- P — PULL BOX (OVER 4" SQUARE)
- BELL/BUZZER/CHIME
- PUSH BUTTON/DOOR BELL/START-STOP
- PP — POWER POLE
- POINT OF DIRECT CONNECTION TO EQUIPMENT
- C (2) — CLOCK RECEPTACLE SHALL BE MOUNTED 12" BELOW FINISHED CEILING. (2) DENOTES DOUBLE SIDED CLOCK.

## LIGHTING

LETTER(S) DENOTE TYPE- SEE LIGHTING FIXTURE SCHEDULE FOR ADDITIONAL INFORMATION.

2' X 4' | 2' X 2' | 1' X 4' | 1' X 2' | 1' X 1'

- STRIP LIGHTING FIXTURES.
- ROUND DOWNLIGHT FIXTURE.
- SQUARE DOWNLIGHT FIXTURE.
- WALL MOUNTED LIGHTING FIXTURE.
- TRACK LIGHTING FIXTURE. MOUNTED AS SHOWN ON LIGHTING FIXTURE SCHEDULE.
- CEILING MOUNTED EXIT SIGN; ARROWS AS INDICATED. SHADED AREA DENOTES FACE.
- WALL MOUNTED EXIT SIGN; ARROWS AS INDICATED. SHADED AREA DENOTES FACE.
- EMERGENCY WALL MOUNTED LIGHTING FIXTURE. BATTERY OPERATED UNLESS NOTED OTHERWISE.
- SITE LIGHTING FIXTURE.

HATCHING PATTERNS BELOW SHALL APPLY TO ALL LIGHTING FIXTURE SYMBOLS.

- NL — LIGHT FIXTURE ON EMERGENCY BRANCH CIRCUIT. PROVIDE UNSWITCHED HOT, NEUTRAL AND GROUND FOR ALL EMERGENCY LIGHTING ORIGINATING FROM THE EMERGENCY CIRCUIT SHOWN. "NL" NIGHT LIGHT ON UNSWITCHED 24HR OPERATION
- EM CIRCUIT — LIGHT FIXTURE ON EMERGENCY BRANCH CIRCUIT, GENERATOR TRANSFER DEVICES REQUIRED (UL1008 OR UL924) PROVIDE UNSWITCHED HOT, NEUTRAL AND GROUND FOR ALL EMERGENCY LIGHTING ORIGINATING FROM THE EMERGENCY CIRCUIT SHOWN.
- CRITICAL OPERATIONS LIGHTING ORIGINATING FROM THE CRITICAL CIRCUIT INDICATED, HATCHED AS INDICATED. HATCHING TYPICAL FOR ALL CRITICAL BRANCH LIGHT FIXTURES

## RACEWAYS AND WIRING

- CAP AND STAKE
- CONDUIT CONCEALED IN WALL OR CEILING
- UNDERGROUND, UNDERSLAB, CONCEALED ROUTING
- OHE — OVERHEAD ELECTRIC PRIMARY UTILITY POWER LINE
- CONDUIT UP/DOWN
- HASH MARKS INDICATE NUMBER OF CONDUCTORS. LEFT TO RIGHT: PHASE/NEUTRAL/GROUND/ISOLATED GROUND. NO HASH MARKS INDICATES EMPTY CONDUIT, 1" MINIMUM, UNLESS NOTED OTHERWISE.
- 1LA-2,4,6 — HOMERUN TO PANEL WITH CIRCUIT NUMBER(S) AS INDICATED.
- (ON)1LA-6 — PARTIAL/SHARED CIRCUIT HOMERUN TO PANEL.
- TELECOMMUNICATIONS CABLE TRAY SHALL BE CONCEALED ABOVE ACCESSIBLE CEILING UNLESS OTHERWISE NOTED.

## ELECTRICAL EQUIPMENT

- DISTRIBUTION PANEL
- MSB — SWITCHBOARD, MAIN DISTRIBUTION PANEL OR MOTOR CONTROL CENTER
- PANELBOARD (FLUSH/SURFACE MOUNT)
- FLOOR MOUNTED DRY-TYPE TRANSFORMER
- SUSPENDED OR WALL MOUNTED TRANSFORMER
- ATS — AUTOMATIC TRANSFER SWITCH
- FIRE RATED PLYWOOD TERMINAL BOARD, TYPE AS NOTED, 4' X 8' X 3/4" UNLESS NOTED OTHERWISE

## COMMUNICATIONS

DEFAULT ELEVATION (UNLESS INDICATED OTHERWISE) TO CENTER OF ROUGH-IN: 18" ABOVE FINISHED FLOOR (AFF)

- DATA/COMM/AV ROUGH-IN. CONDUIT TO PLENUM AND BOX ONLY
- HS — DS — SCHOOL INTERCOMMUNICATION SYSTEM HANDSET.

DEFAULT ELEVATION (UNLESS INDICATED OTHERWISE) TO CENTER OF ROUGH-IN: 42" AFF

- VC — VOLUME CONTROL - WALL MOUNTED
- CB — INTERCOM/PA SYSTEM CALL-IN OR CALL-BACK DEVICE

DEFAULT ELEVATION (UNLESS INDICATED OTHERWISE) TO CENTER OF ROUGH-IN: 120" AFF OR 12" BELOW CEILING, WHICHEVER IS LOWER

- S — INTERCOM/PA SPEAKER "L" LOCAL SOUND REINFORCEMENT

CEILING MOUNTED DEVICES:

- S VC — INTERCOM/PA SPEAKER. "VC" INDICATES VOLUME CONTROL ON SPEAKER.

REFERENCE TECHNOLOGY/SECURITY SHEET FOR ADDITIONAL INFORMATION.

## ONE-LINE DIAGRAM

- TRANSFORMER, TYPE AND RATINGS AS NOTED
- 800A/3P — SWITCH, RATING AS SHOWN
- 400A — FUSE, RATING AS SHOWN
- ST — SHUNT TRIP
- GFP — GROUND FAULT PROTECTION
- K — KIRK-KEY INTERLOCK
- M — DIGITAL METER OR SUB-METER INTEGRATED INTO EQUIPMENT
- 1200/5 — CURRENT TRANSFORMER, RATED AS SHOWN
- GROUND CONNECTION
- AUTOMATIC TRANSFER SWITCH
- BUS DUCT PLUG
- M — ELECTRICAL UTILITY REVENUE METER
- SPD — SURGE PROTECTION DEVICE
- GANN — GENERATOR ANNUNCIATOR PANEL
- CIRCUIT BREAKER
- DRAW-OUT CIRCUIT BREAKER

## DAYLIGHT ZONES

- DAYLIGHT ZONE/PRIMARY DAYLIGHT ZONE
- SECONDARY DAYLIGHT ZONE

DAYLIGHT ZONES SHALL BE INCLUSIVE OF THE FIXTURES WITHIN THE SHADED REGION, AND SHALL BE DIMMED USING ON-BOARD OR EXTERNAL CONTROL IN ACCORDANCE WITH IECC 2021. IECC 2018 OR 2015 MAY BE REFERENCED ONLY WHERE ADOPTED BY LOCAL AHJ.

## MISCELLANEOUS

- SHADED SYMBOLS INDICATE EXISTING DEVICES TO REMAIN, UNLESS OTHERWISE NOTED.
- INDICATES WALL-MOUNTED WHEN ATTACHED TO ANY SYMBOL
- 1 — DRAWING NOTE REFERENCE
- SOS — AREA OF RESCUE ASSISTANCE

## FIRE ALARM

- W — WATER FLOW SWITCH
- SP — SUPERVISORY SWITCH
- S — SMOKE DETECTOR - MULTI CRITERIA DETECTOR
- S # — SMOKE DETECTOR - "SB" INDICATES IN INTEGRAL SOUNDER BASE "D" INDICATES DUCT TYPE "R" INDICATES 120 VOLT RESIDENTIAL TYPE
- H — HEAT DETECTOR
- S BT — BEAM DETECTOR TRANSMITTER, HIGH IN CEILING WALL DIRECT LINE OF SIGHT.
- S BR — BEAM DETECTOR RECEIVER, HIGH IN CEILING WALL DIRECT LINE OF SIGHT.
- S — FIRE ALARM SPEAKER STROBE / CEILING MOUNTED
- S — FIRE ALARM SPEAKER / CEILING MOUNT.
- DH — MAGNETIC DOOR HOLDER
- R — AUXILIARY CONTROL RELAY
- FH — FIRE FIGHTER HANDSET
- F — FIRE ALARM PULL STATION +42" AFF
- F — FIREMAN'S TELEPHONE JACK +42" AFF
- AUDIO VISUAL FIRE ALARM HORN STROBE +80" AFF- 15/75cd U.N.O.
- VISUAL FIRE ALARM (STROBE) CEILING MOUNT - 15/75cd U.N.O.
- AUDIO FIRE ALARM HORN +80" AFF
- FACP — FIRE ALARM CONTROL PANEL
- ANN — REMOTE FIRE ALARM ANNUNCIATOR PANEL
- RPS — REMOTE POWER SUPPLY FOR AUDIO/VISUAL FIRE ALARM DEVICES.
- FSD — FIRE SMOKE DAMPER
- • — REMOTE LED INDICATOR LIGHT

## SECURITY

- PB — ADA AUTO DOOR OPEN BUTTON
- DR — DOOR RELEASE BUTTON
- CR — WALL MOUNTED CARD READER

REFERENCE TECHNOLOGY/SECURITY SHEET FOR ADDITIONAL INFORMATION.

## SWITCHES AND LIGHTING CONTROL DEVICES

ALL SWITCH TYPES AND SENSORS TYPES FOUND ON 'LIGHTING CONTROL DEVICE SCHEDULE' LOCATED ON ELECTRICAL SCHEDULE SHEETS

SWITCH ANNOTATION AS FOLLOWS:

- X a,b,c — TYPE, PER SCHEDULE. NO TYPE INDICATES SINGLE POLE TOGGLE SWITCH. SWITCH LEGS, PER PLAN, SHOWN HERE AS 3 (a,b,c)

OCCUPANCY SENSOR ANNOTATION, AS FOLLOWS:

- OCx — OCCUPANCY / VACANCE SENSOR 'x' INDICATES TYPE, PER SCHEDULE. CEILING SENSOR. WITH BRACKET INDICATES WALL / CORNER MOUNT

LIGHT SENSOR ANNOTATION, AS FOLLOWS:

- PC — DIGITAL PHOTOCELL
- DS — DAYLIGHT HARVESTING SENSOR

RELAY PANELS, CONTACTORS, TIME SWITCHES:

- XX — RELAYS/CONTACTORS/TIMERS/DEVICES WHERE 'XX' INDICATES: "LC" LIGHTING CONTRACTOR "LCP" LIGHTING CONTROL PANEL "TS" TIME SWITCH "TC" TIME CLOCK

## DRAWING/DETAIL REFERENCE KEY

RE: 1 /E3-2 — REFER TO DRAWING/DETAIL NUMBER: 1 / E3-2 (SHEET NUMBER)

## PANELBOARD NOMENCLATURE

5 DP C H A 1

- 5 — SUB PANEL
- DP — AREA
- C — VOLTAGE H: 480Y/277V L: 208Y/120V
- H — BRANCH NONE: NORMAL E: LIFE SAFETY Q: EQUIPMENT C: CRITICAL R: LEGALLY REQUIRED X: OPTIONAL STAND-BY
- A — DISTRIBUTION PANEL (IF APPLICABLE)
- 1 — LEVEL

# GENERAL NOTES:

A. NOT ALL SYMBOLS SHOWN ON THIS SYMBOL LIST ARE USED IN THE CONTRACT DOCUMENTS.

## GENERAL DEMOLITION SCOPE NOTES:

A. CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRESENT ON SITE PRIOR TO BIDDING, AND SHALL BE EXPECTED TO PERFORM DEMOLITION AND INSTALL NEW AS SHOWN ON THE DOCUMENTS, INCLUDING SCOPE THAT MAY NOT FEASIBLY BE INDICATED ON PLAN.

B. CONTRACTOR SHALL VERIFY AND DOCUMENT EXISTING CONDITIONS OF ALL OUTLETS (AS DEFINED BY NEC) THAT ARE INDICATED OR REQUIRED TO BE REMOVED AND REINSTALLED TO FACILITATE THE WORK REQUIRED BY ALL TRADES. WHERE OUTLETS ARE REINSTALLED IN NON-OPERABLE CONDITION, THE CONTRACTOR SHALL REPLACE AT NO COST TO THE OWNER. DOCUMENT OUTLETS IN NON-WORKING CONDITION PRIOR TO REMOVE AND NOTIFY THE OWNER.

C. OWNER SHALL HAVE FIRST RIGHT OF REFUSAL TO ALL REMOVED MATERIALS. CONTRACTOR SHALL COORDINATE WITH OWNER FOR LOCATION TO RETURN ANY AND ALL MATERIAL FOR OWNER STORAGE. FAILURE TO TURN OVER REMOVED MATERIAL TO OWNER MAY REQUIRE CONTRACTOR TO REPLACE EQUIPMENT REMOVED WITH NEW.

D. REMOVE ALL ELECTRICAL DEVICES WITHIN DEMOLISHED WALLS INCLUDING RECEPTACLES, SWITCHES, DATA/TELEPHONE DROPS, FIRE ALARM DEVICES, PA DEVICES, CONDUIT, AND WIRING. REMOVE CONDUIT AND WIRING BACK TO PANEL OR LAST ACTIVE JUNCTION BOX. REFER TO ARCHITECTURAL DEMO PLAN. THIS SCOPE MAY NOT BE DIRECTLY IMPLIED BY NOTES ON DEMO PLANS AS IT IS ASSUMED THIS SCOPE EXISTS BASED ON ARCHITECTURAL DEMOLITION PLANS.

E. REFERENCE FIRE ALARM GENERAL NOTES FOR ASSOCIATED FIRE ALARM SCOPE OF WORK.

F. ALL ABANDONED CONDUIT AND BOXES FOUND IN CRAWLSPACES, CEILINGS SPACES, CHASES, OR UTILITY SPACES SHALL BE REMOVED. ANY EXISTING CONDUIT THAT IS UNDERGROUND MAY BE ABANDONED.

G. CONTRACTOR SHALL REVIEW DEMO AND NEW WORK PLANS SIMULTANEOUSLY TO IDENTIFY SCOPE THAT IS TO BE MODIFIED FOR REUSE WITH NEW SCOPE.

## POWER GENERAL NOTES:

A. ELECTRICAL DEVICES SHOWN ARE NOT EXACT. ALL DEVICE LOCATIONS SHALL BE VERIFIED WITH ARCHITECTURAL MILLWORK, CASEWORK, AND GENERAL ELEVATION VIEWS.

B. ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT, OUTLET BOXES, JUNCTION BOXES FOR ALL TECHNOLOGY, LOW VOLTAGE, ACCESS CONTROL SECURITY, SURVEILLANCE, AND OTHER DIVISION 27/28 SCOPE. REFER TO DIVISION 27/28 DRAWINGS AND SPECIFICATIONS FOR ALL WORK REQUIRED. OMISSION OF THIS SCOPE FROM DIV 26 SCOPE OF WORK IS PROHIBITED.

C. PROVIDE LABELING OF ALL DEVICES, CONDUIT, PANELS, AND JUNCTION BOXES IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS.

D. MINIMIZE ROOF PENETRATIONS. WHERE ABLE, ROUTE ALL CONDUIT FOR ROOF MOUNTED EQUIPMENT THROUGH ROOF CURB. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING NECESSARY WATER PROOFING AROUND ROOF PENETRATIONS WITH ROOFING INSTALLER.

E. ALL RECEPTACLES LOCATED IN RESTROOMS, JANITOR CLOSETS, MECHANICAL ROOMS, ELEVATOR PITS OR SHAFTS, ELEVATOR EQUIPMENT ROOMS, SERVING ELECTRIC DRINKING FOUNTAINS OR VENDING MACHINES, LOCATED WITHIN 6' OF A SINK, LOCATED ABOVE A WET COUNTERTOP OR IN A KITCHEN OR COFFEE BAR SHALL BE GFCI. FEED-THRU GFCI/GFI IS PROHIBITED. ALL GFCI/GFI DEVICES SHALL BE PROVIDED WITH INDIVIDUAL TEST/RESET FEATURES.

F. MULTI-WIRE HOME RUNS SHALL NOT BE ALLOWED. PROVIDE DEDICATED NEUTRALS FOR ALL CIRCUITS. SHARING CONDUIT IS PERMISSIBLE WHERE TOTAL CONDUCTOR AMPACITY DERATING HAS BEEN PERFORMED BY ELECTRICAL CONTRACTOR. THE NEUTRAL IS CONSIDERED CURRENT-CARRYING.

G. ALL RECEPTACLES SHALL BE TAMPER RESISTANT TYPE. CONTRACTOR MAY PROVIDE NON-TAMPER-RESISTANT RECEPTACLES WHERE NOT REQUIRED PER CURRENT NEC ARTICLE 406

H. LABEL ALL CIRCUITS AT ALL JUNCTION BOXES AND OUTLETS (AS DEFINED BY NEC) WITH TYPE-WRITTEN LABEL IDENTIFYING CIRCUIT ON THE BACK OF DEVICE COVER PLATES OR ON COVER OF JUNCTION BOX. IF A BOX HAS MULTIPLE CIRCUITS WITHIN, LABEL ALL CIRCUITS.

I. REFER TO T-SERIES DRAWINGS FOR SPECIAL SYSTEMS REQUIREMENTS.

PROVIDE BACKBOX(ES), RACEWAY(S) WITH PULLSTRING AND BUSHINGS TO ABOVE ACCESIBLE CEILING REQUIRED FOR ROUGH-IN FOR THE FOLLOWING SYSTEMS:

- SECUTITY (CAMERA'S, CARD READERS, ACCESS CONTROL)
- VOICE/DATA
- A/V

WHERE 120V POWER FOR CONTROLS IS REQUIRED, CONNECT TO NEAREST CIRCUIT SERVING GENERAL PURPOSE RECEPTACLES. COORDINATE REQUIREMENT WITH FINAL SELECTED EQUIPMENT.

## FIRE ALARM SYSTEM SPECIFICATION

SCOPE OF WORK

Provide new and relocated devices and cabling to tie into existing building fire alarm control panel. Fire alarm contractor shall be responsible for providing a full device layout complying with all NFPA, State, and local requirements.

Activation of any manual pull station, automatic smoke detector or duct mounted smoke detector shall cause the following actions and indications:

1. The system common alarm LED on the CPU shall flash. The internal audible shall sound. Acknowledging the alarm condition shall silence the audible device and the common alarm LED shall illuminate steady.
2. Activate the fire alarm signals.
3. Activate an alarm closure for the notification of the Landlord's fire alarm system.

INSTALLATION

WIRING

1. All wiring shall be in accordance with NFPA 72 and the National Electrical Code, Local Codes, and article 760 of NFPA Standard 70. All wiring sizes shall conform to recommendations of the equipment manufacturer, and as indicated on the engineered shop drawings.
2. All wire shall be U.L. Listed FPL for limited energy (300V) and fire alarm applications and shall be installed in conduit. Limited energy FPLP or MPP wire may be run open in return air ceiling plenums provided such wire is U.L. Listed to U.L. TEST 910 for such applications and is of the low smoke producing fluorocarbon type and complies with NEC Article 760 if so approved by the local authority having jurisdiction.
3. All wiring for SLC signalling circuits shall be of the twisted/shielded, low capacitance type to guard against outside RF and EMF interference and induced noise.
4. All wiring shall be run in a supervised fashion (i.e. no branch wiring or dog-legged wiring) per NFPA requirements such that any wiring disarrangement will initiate the appropriate trouble signals via the main control panel per NFPA and U.L. requirements.
5. Wiring splices shall be kept to a minimum with required splices to be made in designated terminal boxes or at field device junction boxes. Transposing or color code changes of wiring will not be permitted. End-of-line supervisory devices shall be installed with the last device on the respective circuit. Said device shall be appropriately marked designating it as the terminating device on the respective circuit.
6. No A.C. wiring or any other wiring shall be run in the same conduit as fire alarm wiring.

OPEN WIRING (IF APPROVED BY LOCAL AUTHORITY HAVING JURISDICTION)

1. Systems utilizing open wiring techniques with low smoke plenum cable shall provide conduit in all inaccessible locations, inside concealed walls, all mechanical/electrical rooms, or other areas where wiring might be exposed and subject to damage. There shall be no exposed cables.
2. Support wire clear of knock out panels, access panels, and maintenance spaces for equipment. Wire and cable shall be run using wire management techniques supporting cable as close as possible to within one foot of the floor or roof rafters. Wire supports shall be directly fastened to the structure on a maximum of five foot centers. Wire routing shall be parallel and perpendicular to building lines. The wire and cable shall be secured with tie wraps or carrier wire. Sagging in excess of three inches will not be allowed nor will bending of the supporting ring structure.

CONDUIT/RACEWAY

1. All wire shall be installed in an approved conduit/raceway system (except where permitted by NEC and the local authority having jurisdiction). Maximum conduit "fill" shall not exceed 40% per NEC.
2. Conduit and raceway system shall be installed as specified under the general electrical section of the specifications, and per NEC.
3. Minimum conduit size shall be 3/4" EMT. Install conduit per engineered shop drawings.

MINIMUM WIRE SIZES SHALL BE AS FOLLOWS:

1. Initiating Zones: 18 AWG
2. Indicating Zones: 14 AWG
3. Relay Control Circuits: 18 AWG

TEST AND REPORTS

A state licensed factory trained technical representative of the manufacturer shall perform the final control panel connections and supervise testing of the system and it shall be subject to the approval of the responsible engineer and owner. Upon completion of the acceptance tests, the owner and/or his representatives shall be instructed in the proper operation of the system.

The installing contractor shall functionally test each and every device in the entire system for proper operation and response. In addition, each circuit in the system shall be fully tested for wiring supervision to insure proper wiring installation. Any items found not properly installed or non-functioning shall be replaced or repaired and retested. All testing shall be supervised by a licensed fire alarm superintendent.

The installing contractor shall provide a complete written report on the functional test of the entire system. The test and report shall verify the function of each device in the system, operation of all auxiliary control functions, and the proper operation of the main fire alarm control panel. A copy of the test report shall be provided with maintenance manuals. The test report shall be signed and dated by the licensed fire alarm superintendent responsible for supervising the final system test and checkout.

The installing contractor's fire alarm superintendent shall test the entire system in the presence of the local authorities having jurisdiction.

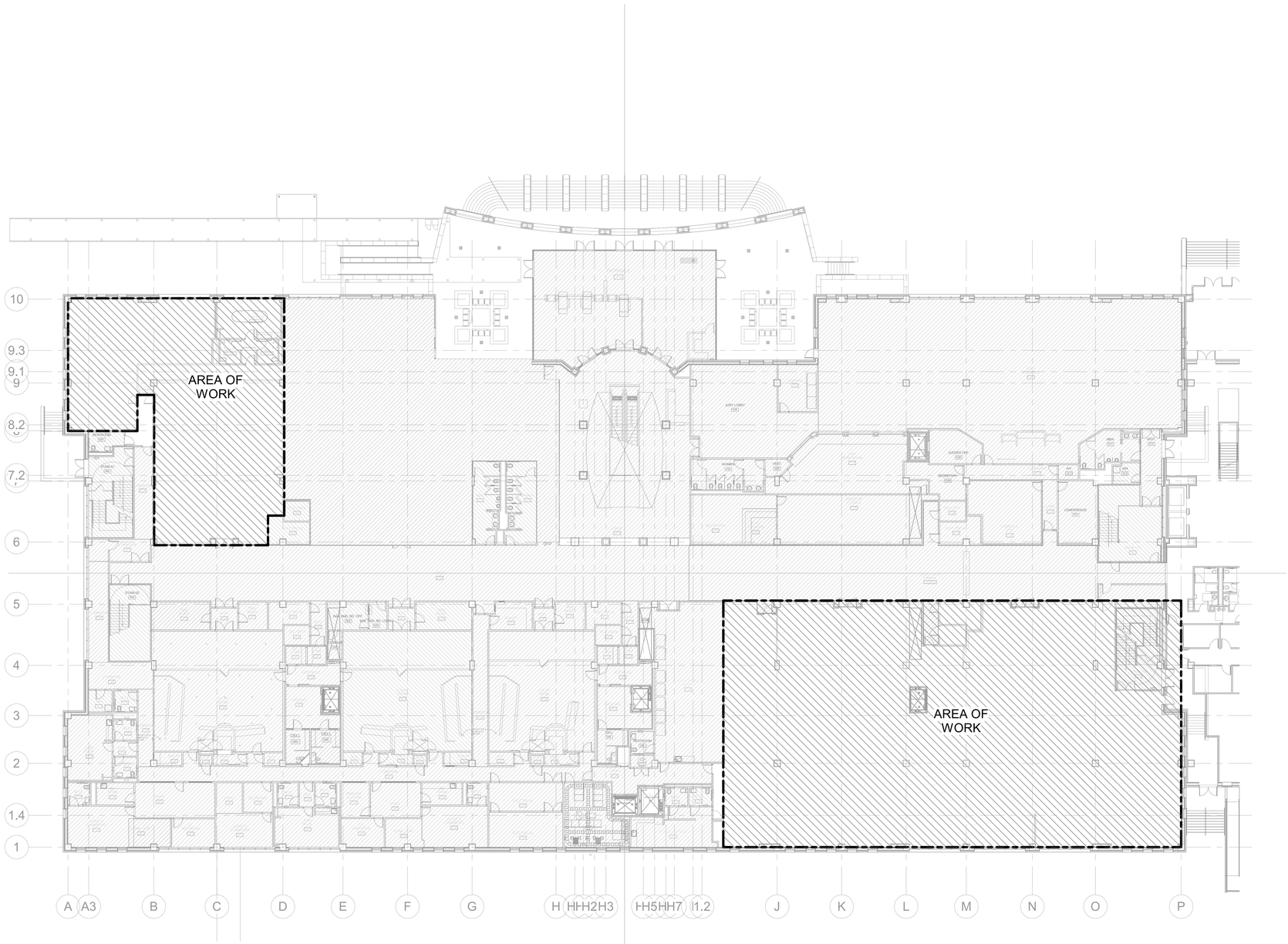
WARRANTY

The fire alarm system shall be free from defects in workmanship and materials, under normal use and service, for a period of one year from the date of acceptance or beneficial occupancy, whichever shall occur first. Any equipment shown to be defective shall be repaired, replaced or adjusted during normal working hours at no cost to the owner.

The equipment manufacturer shall be represented by a local service organization and the name of such shall be furnished to the Owner, Architect, and Engineer.

## GENERAL ELECTRICAL NOTES

1. COMPLY WITH THE MOST RECENTLY REVISED VERSIONS OF ALL APPLICABLE RULES, REGULATIONS AND ORDINANCES OF THE LOCAL CITY OF FORT BEND COUNTY AUTHORITY AND AS PER 2017 NATIONAL ELECTRICAL CODE, NFPA-70.
2. CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH BUILDING MANAGEMENT FOR ALL CONSTRUCTION STANDARDS AND SPECIFICATIONS, INCLUDING BUT NOT LIMITED TO STANDARD LIGHT FIXTURES, SWITCHES, RECEPTACLES, COVERPLATES, AND WIRING METHODS AVAILABLE QUANTITIES AND TENANT ALLOWANCES MUST ALSO BE VERIFIED WITH BUILDING MANAGEMENT.
3. THE SCOPE OF THE ELECTRICAL WORK INCLUDES FURNISHING AND INSTALLING ALL ELECTRICAL WORK FOR A COMPLETE INSTALLATION.
4. THIS DRAWING IS FOR FIXTURE AND OUTLET CIRCUITING INFORMATION. REFER TO ARCHITECTURAL DRAWING FOR NOTES, MOUNTING DETAILS AND EXACT LOCATIONS.
5. CONTRACTOR TO PROVIDE PULLSTRING ROUTED TO CEILING PLENUM, TYPICAL FOR EACH TELEPHONE OUTLET IF PLENUM CABLE IS USED. IF CABLE ROUTING IS RESTRICTED BY ROUTING HORIZONTALLY OR IN AN INSULATED WALL, PROVIDE 3/4" CONDUIT WITH PULLSTRING ROUTED TO ABOVE CEILING. IF PLENUM CABLE IS NOT USED OR IN A NONACCESSIBLE CEILING, PROVIDE 3/4" CONDUIT WITH PULLSTRING THROUGH CEILING SPACE TO TERMINAL BOARD LOCATION. COORDINATE WITH TENANT'S CABLE INSTALLER.
6. VERIFY ELECTRICAL REQUIREMENTS (IF ANY) FOR ANY SPECIAL EQUIPMENT, COPIERS, DATA PROCESSING EQUIPMENT, TELEPHONE EQUIPMENT AND KITCHEN APPLIANCE PRIOR TO ANY WORK PERFORMED. PROVIDE ISOLATED GROUND WIRE AND GROUNDING BUS IN PANEL PER MANUFACTURER'S INSTALLATION REQUIREMENTS.
7. ALL RECEPTACLES TO BE MOUNTED A MINIMUM OF 18" A.F.F. AND ALL SWITCHES SHALL BE A MAXIMUM OF 42" A.F.F. UNLESS NOTED OTHERWISE. ALL DIMENSIONS ARE TO THE CENTERLINE.
8. CONTRACTOR SHALL PROVIDE EIGHT SETS OF SUBMITTALS ON ALL ELECTRICAL EQUIPMENT, INCLUDING, BUT NOT LIMITED TO, SWITCHGEAR, LIGHT FIXTURES, ELECTRICAL DEVICES, DIMMERS, RACEWAYS, ETC.
9. ALL WIRING SHALL BE COPPER. ALUMINUM WIRING IS NOT ACCEPTABLE. MINIMUM WIRE SIZE IS #12 AWG. CONDUCTOR SIZES #12 AND #10 SHALL BE SOLID. CONDUCTORS SIZED #8 AND LARGER SHALL BE STRANDED. INSULATION SHALL BE "UL" TYPE THHN/THWN. METAL CLAD AND ARMOR CLAD CABLE MAY BE USED FOR BRANCH CIRCUITS IF APPROVED BY THE AUTHORITY HAVING JURISDICTION.
10. MANUFACTURER AND CLASS OF ALL NEW DISTRIBUTION PANELS, LIGHTING PANELS, TRANSFORMERS, DISCONNECT SWITCHES, ELECTRIC SUB-METERS, ETC. SHALL MATCH EXISTING BUILDING ELECTRICAL GEAR. G.E., SQUARE 'D', AND EATON ARE ACCEPTABLE ALTERNATES WITH PRIOR APPROVAL BY ENGINEER. ALL BUSSING SHALL BE COPPER. ALUMINUM BUSSING IS NOT ACCEPTABLE. LOAD CENTERS ARE NOT ACCEPTABLE ALTERNATES FOR PANELBOARDS.
11. LAMP SPECIFICATION SHALL MATCH BUILDING STANDARDS FOR MANUFACTURER, WATTAGE, AND COLOR. IF NON BUILDING STANDARD LAMPS EXIST, RELAMPING REQUIREMENTS SHALL BE CONFIRMED WITH BUILDING MANAGEMENT PRIOR TO FINAL PRICING. ALL INCANDESCENT LAMPS SHALL BE RATED FOR 120V UNLESS NOTED OTHERWISE. FOR NON BUILDING STANDARD FIXTURES, LAMPS SHALL BE MANUFACTURED BY GENERAL ELECTRIC, NORTH AMERICAN PHILIPS, OR OSRAM-SYLVANIA. ALL LAMPS, IN NEW AND EXISTING FIXTURES, SHALL BE IN WORKING ORDER UPON COMPLETION OF THE WORK.
12. ALL ELECTRICAL MATERIALS USED ON THIS PROJECT MUST BE U.L. LISTED AND LABELED.
13. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES AND SUB-CONTRACTORS TO PROVIDE A COMPLETE WORKING SYSTEM.
14. THIS CONTRACTOR SHALL FURNISH AND INSTALL ALL MOTOR STARTERS NOT PROVIDED WITH MECHANICAL OR PLUMBING EQUIPMENT.
15. THIS CONTRACTOR SHALL PROVIDE CONDUIT FOR CONTROL WIRING. COORDINATE WITH MECHANICAL CONTRACTOR.
16. COORDINATE WITH MECHANICAL AND PLUMBING DRAWINGS FOR EXACT EQUIPMENT LOCATION SUCH AS RTU'S, VAV'S, ACCU'S, HPS, EFS, WATER HEATERS, PUMPS ETC.
17. MAINTAIN ALL U.L. FIRE RATED ASSEMBLIES AS NOTED ON ARCHITECTURAL DRAWINGS WHENEVER PENETRATING FLOOR SLABS, FIRE RATED CEILINGS AND FIRE RATED WALLS. ALL FIRE PROOFING MUST BE U.L. LISTED FOR THAT APPLICATION.
18. PROVIDE IDENTIFICATION OF ALL NEW PANELBOARD AND DISTRIBUTION EQUIPMENT WITH ENGRAVED PHENOLIC PLASTIC LABEL ADHERED TO COVER. LABEL MUST IDENTIFY EQUIPMENT NAME, VOLTAGE AND PHASE, AMPACITY, AND SERVICE SOURCE.
19. PROVIDE UPDATED, TYPED DIRECTORY FOR EACH PANELBOARD, DESIGNATING NEW CIR




1 E2.01 **LEVEL 1 COMPOSITE ELECTRICAL PLAN**
1/16" = 1'-0"

**CLIENT**

THE STATE OF TEXAS · FORT BEND COUNTY ·

**FORT BEND COUNTY**

301 JACKSON ST.
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**CONSULTANT**

**REGISTRATION**

STATE OF TEXAS · ROMAN MATRUK · 131169 · LICENSED PROFESSIONAL ENGINEER

10/17/2024

**DRAWING HISTORY**

| No. | DATE | DESCRIPTION |
|---|---|---|
| | 05/01/2024 | 100% DESIGN DEVELOPMENT |
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTUCTION DOCUMENTS |
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**
1007828.00

**SHEET TITLE**
LEVEL 1 COMPOSITE ELECTRICAL PLAN

**SHEET NUMBER**
E2.01

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9990 Richmond Avenue
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Houston, Texas 77042
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TBPE Firm Registration No. 2234

DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

TN PN

1 EPD2.10 **LEVEL 1 PARTIAL DEMOLITION ELECTRICAL POWER PLAN A**
1/8" = 1'-0"

## GENERAL POWER DEMOLITION NOTES:

A. GENERAL DEMOLITION NOTES APPLY TO ALL DEMO/REMODELING SCOPE.

B. WHEN OUTLETS ARE ABANDONED, WIRE MUST BE PULLED OUT OF THE CONDUIT BACK TO THE NEAREST REMAINING BOX OR CABINET. EXPOSED CONDUIT THAT HAS BEEN ABANDONED MUST BE REMOVED.

C. RE-ESTABLISH SERVICE TO ALL OUTLETS THAT MAY BE INTERRUPTED DUE TO REMODELING WORK.

D. PROVIDE ALL APPURTENANCES REQUIRED TO REROUTE, RELOCATE, REMOVE OR REINSTALL ALL ITEMS DESCRIBED IN THESE NOTES.

E. EXISTING CIRCUITS MODIFIED IN FIELD SHALL NOT EXCEED 80% CAPACITY BASED ON AMP-RATING OF CIRCUIT.

F. DO NOT LEAVE ABANDONED CONDUIT, BOXES, EQUIPMENT, OR ENCLOSURES AFTER DEMOLITION. ALL ABANDONED MATIERAL MUST BE REMOVED.

G. IDENTIFICATION AND LABELING SHALL BE PROVIDED IN ACCORDANCE WITH SPECIFICATIONS AND/OR NEW-WORK GENERAL ELECTRICAL NOTES.

H. CIRCUIT NUMBERS ARE FOR PLAN REFERENCE ONLY. CONTRACTOR SHALL RELABEL ALL CIRCUIT DIRECTORIES WITH LOAD NAMES FOR ALL EXISTING AND NEW PANELS THAT WERE MODIFIED WITHIN THIS PROJECT.

I. EXISTING CIRCUIT BREAKERS VACATED DUE TO REMODELING WORK SHALL REMAIN AS SPARE BREAKERS AND TURNED TO THE 'OFF' POSITION.

J. WHERE INDICATED OR REQUIRED BY OTHER TRADES, CONTRACTOR SHALL REMOVE ALL ELECTRICAL CONNECTIONS TO EXISTING PREWIRED FURNITURE. REMOVE CONDUIT AND WIRING BACK TO LAST ACTIVE JUNCTION. ALL DATA CABLING SHALL BE REMOVED BACK TO LAST ACTIVE JUNCTION AND SALVAGED FOR REINSTALLATION.

K. ALL EQUIPMENT AND DEVICES ARE EXISTING TO REMAIN UNLESS NOTED OTHERWISE.

## ELECTRICAL KEYED NOTES

E3.9 EXISTING FPT TO BE REMOVED. REMOVE DISCONNECT AND ELECTRICAL DEVICES. CONTRACTOR TO REMOVE ALL CONDUIT AND WIRING BACK TO SOURCE. EXISTING BREAKER TO BE RE-USE FOR NEW FTP.

### LINE WEIGHT LEGEND

| LINE WEIGHT | DESCRIPTION |
|---|---|
| ——— | EXISTING TO REMAIN |
| - - - - - - - | EXISTING TO BE REMOVED |


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|---|---|---|---|---|

TN PN

**CLIENT**

THE STATE OF TEXAS FORT BEND COUNTY

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**CONSULTANT**

**REGISTRATION**

STATE OF TEXAS ROMAIN MATHUR 131169 LICENSED PROFESSIONAL ENGINEER
10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
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| | 10/17/2024 | ISSUE FOR PERMIT & BID |

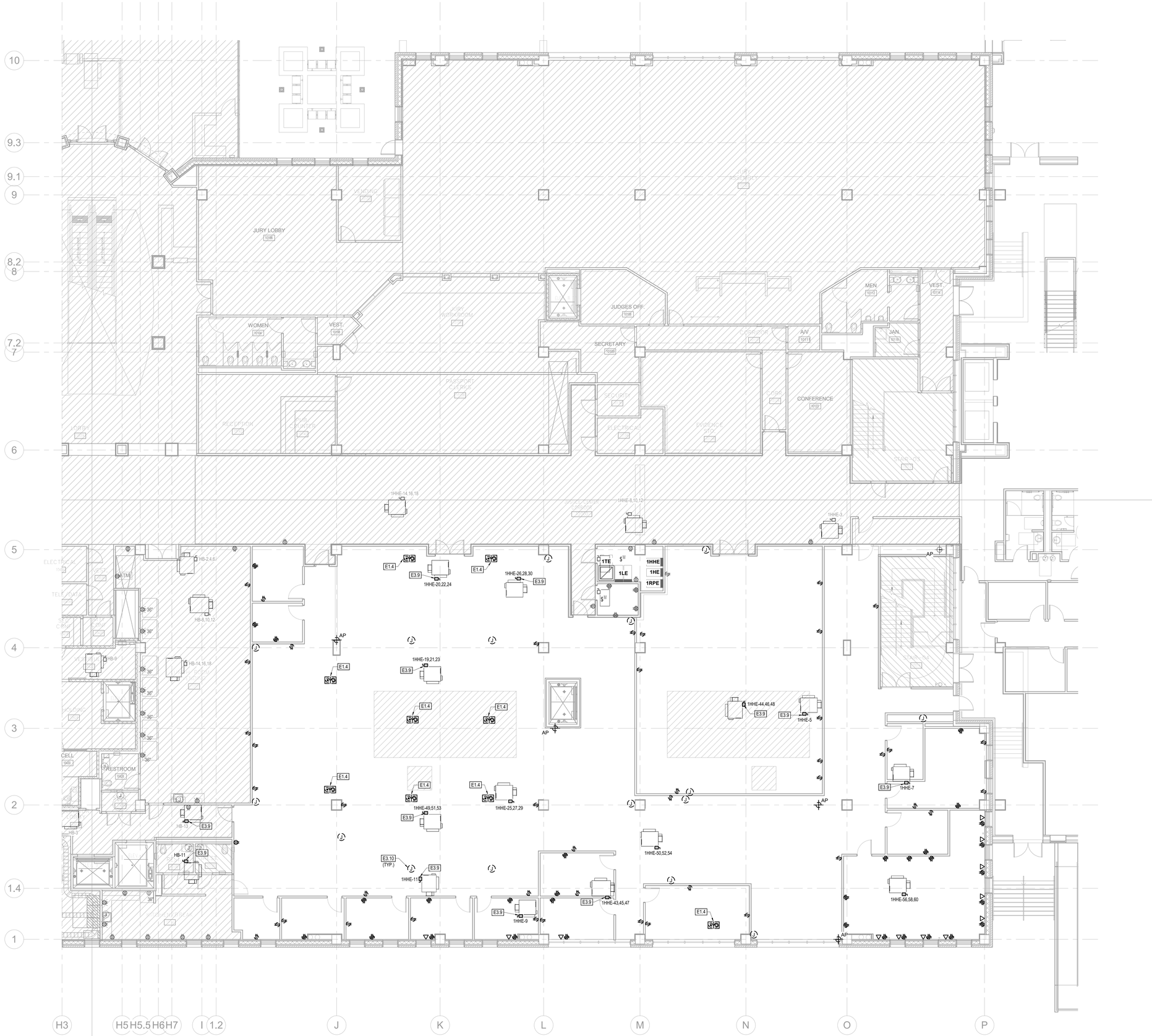
**PROJECT NAME**
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX
77469

**PROJECT NUMBER**
1007828.00

**SHEET TITLE**
LEVEL 1 PARTIAL DEMOLITION ELECTRICAL POWER PLAN A

**SHEET NUMBER**
EPD2.10




1 EPD2.17 **LEVEL 1 PARTIAL DEMOLITION ELECTRICAL POWER PLAN B**

1/8" = 1'-0"

## GENERAL POWER DEMOLITION NOTES:

A. GENERAL DEMOLITION NOTES APPLY TO ALL DEMO/REMODELING SCOPE.

B. WHEN OUTLETS ARE ABANDONED, WIRE MUST BE PULLED OUT OF THE CONDUIT BACK TO THE NEAREST REMAINING BOX OR CABINET. EXPOSED CONDUIT THAT HAS BEEN ABANDONED MUST BE REMOVED.

C. RE-ESTABLISH SERVICE TO ALL OUTLETS THAT MAY BE INTERRUPTED DUE TO REMODELING WORK.

D. PROVIDE ALL APPURTENANCES REQUIRED TO REROUTE, RELOCATE, REMOVE OR REINSTALL ALL ITEMS DESCRIBED IN THESE NOTES.

E. EXISTING CIRCUITS MODIFIED IN FIELD SHALL NOT EXCEED 80% CAPACITY BASED ON AMP-RATING OF CIRCUIT.

F. DO NOT LEAVE ABANDONED CONDUIT, BOXES, EQUIPMENT, OR ENCLOSURES AFTER DEMOLITION. ALL ABANDONED MATERIAL MUST BE REMOVED.

G. IDENTIFICATION AND LABELING SHALL BE PROVIDED IN ACCORDANCE WITH SPECIFICATIONS AND/OR NEW-WORK GENERAL ELECTRICAL NOTES.

H. CIRCUIT NUMBERS ARE FOR PLAN REFERENCE ONLY. CONTRACTOR SHALL RELABEL ALL CIRCUIT DIRECTORIES WITH LOAD NAMES FOR ALL EXISTING AND NEW PANELS THAT WERE MODIFIED WITHIN THIS PROJECT.

I. EXISTING CIRCUIT BREAKERS VACATED DUE TO REMODELING WORK SHALL REMAIN AS SPARE BREAKERS AND TURNED TO THE 'OFF' POSITION.

J. WHERE INDICATED OR REQUIRED BY OTHER TRADES, CONTRACTOR SHALL REMOVE ALL ELECTRICAL CONNECTIONS TO EXISTING PREWIRED FURNITURE. REMOVE CONDUIT AND WIRING BACK TO LAST ACTIVE JUNCTION. ALL DATA CABLING SHALL BE REMOVED BACK TO LAST ACTIVE JUNCTION AND SALVAGED FOR REINSTALLATION.

K. ALL EQUIPMENT AND DEVICES ARE EXISTING TO REMAIN UNLESS NOTED OTHERWISE.

## ☐ ELECTRICAL KEYED NOTES

E1.4 EXISTING FLOOR BOX TO BE REMOVED. CONTRACTOR TO PATCH AND PAINT EXISTING FLOOR TO MATCH ADJACENT AREA. ABANDON CONDUIT IN PLACE. REMOVE ALL WIRING BACK TO SOURCE. RE-USE EXISTING CIRCUIT BREAKER.

E3.9 EXISTING FPT TO BE REMOVED. REMOVE DISCONNECT AND ELECTRICAL DEVICES. CONTRACTOR TO REMOVE ALL CONDUIT AND WIRING BACK TO SOURCE. EXISTING BREAKER TO BE RE-USE FOR NEW FTP.

E3.10 EXISTING J-BOX ABOVE CEILING TO BE REMOVED. CONTRACTOR TO REMOVE ALL CONDUIT AND WIRING BACK TO SOURCE. RE-USE EXISTING CIRCUIT BREAKER.

### LINE WEIGHT LEGEND

| LINE WEIGHT | DESCRIPTION |
|---|---|
| ——— | EXISTING TO REMAIN |
| - - - - - - | EXISTING TO BE REMOVED |

TN PN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TBPE Firm Registration No. 2234


| DBR Project Number | 243028 |
|---|---|

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

**CLIENT**

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**CONSULTANT**

**REGISTRATION**

10/17/2024

**DRAWING HISTORY**

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| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
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**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

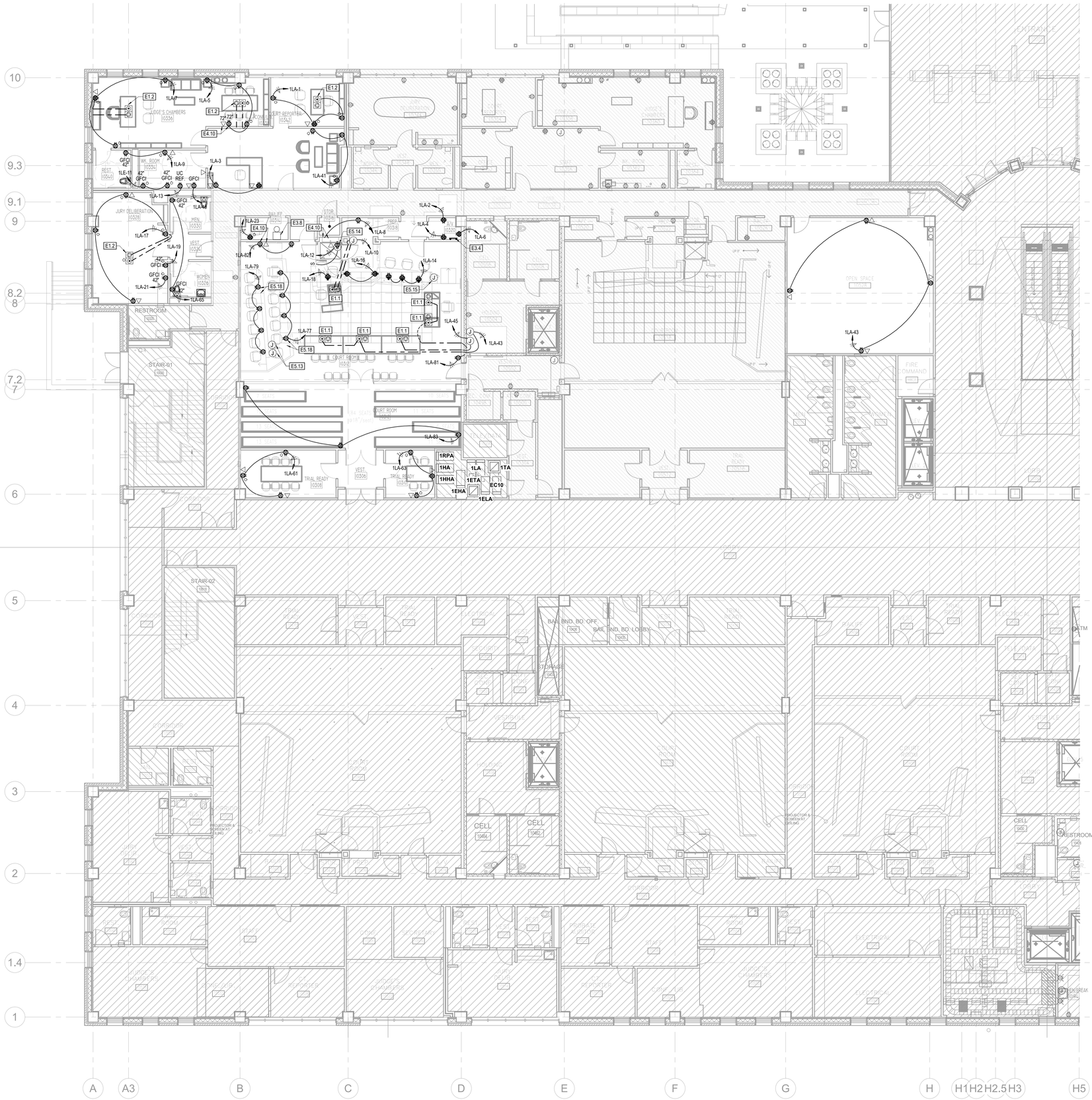
1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL DEMOLITION ELECTRICAL POWER PLAN B

**SHEET NUMBER**

EPD2.11




## POWER GENERAL NOTES:

A. ELECTRICAL DEVICES SHOWN ARE NOT EXACT. ALL DEVICE LOCATIONS SHALL BE VERIFIED WITH ARCHITECTURAL MILLWORK, CASEWORK, AND GENERAL ELEVATION VIEWS.

B. ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT, OUTLET BOXES, JUNCTION BOXES FOR ALL TECHNOLOGY, LOW VOLTAGE, ACCESS CONTROL SECURITY, SURVEILLANCE, AND OTHER DIVISION 27/28 SCOPE. REFER TO DIVISION 27/28 DRAWINGS AND SPECIFICATIONS FOR ALL WORK REQUIRED. OMISSION OF THIS SCOPE FROM DIV 26 SCOPE OF WORK IS PROHIBITED.

C. PROVIDE LABELING OF ALL DEVICES, CONDUIT, PANELS, AND JUNCTION BOXES IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS.

D. MINIMIZE ROOF PENETRATIONS. WHERE ABLE, ROUTE ALL CONDUIT FOR ROOF MOUNTED EQUIPMENT THROUGH ROOF CURB. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING NECESSARY WATER PROOFING AROUND ROOF PENETRATIONS WITH ROOFING INSTALLER.

E. ALL RECEPTACLES LOCATED IN RESTROOMS, JANITOR CLOSETS, MECHANICAL ROOMS, ELEVATOR PITS OR SHAFTS, ELEVATOR EQUIPMENT ROOMS, SERVING ELECTRIC DRINKING FOUNTAINS OR VENDING MACHINES, LOCATED WITHIN 6' OF A SINK, LOCATED ABOVE A WET COUNTERTOP OR IN A KITCHEN OR COFFEE BAR SHALL BE GFCI. FEED-THRU GFCI/GFI IS PROHIBITED. ALL GFCI/GFI DEVICES SHALL BE PROVIDED WITH INDIVIDUAL TEST/RESET FEATURES.

F. MULTI-WIRE HOME RUNS SHALL NOT BE ALLOWED. PROVIDE DEDICATED NEUTRALS FOR ALL CIRCUITS. SHARING CONDUIT IS PERMISSIBLE WHERE TOTAL CONDUCTOR AMPACITY DERATING HAS BEEN PERFORMED BY ELECTRICAL CONTRACTOR. THE NEUTRAL IS CONSIDERED CURRENT-CARRYING.

G. ALL RECEPTACLES SHALL BE TAMPER RESISTANT TYPE. CONTRACTOR MAY PROVIDE NON-TAMPER-RESISTANT RECEPTACLES WHERE NOT REQUIRED PER CURRENT NEC ARTICLE 406

H. LABEL ALL CIRCUITS AT ALL JUNCTION BOXES AND OUTLETS (AS DEFINED BY NEC) WITH TYPE-WRITTEN LABEL IDENTIFYING CIRCUIT ON THE BACK OF DEVICE COVER PLATES OR ON COVER OF JUNCTION BOX. IF A BOX HAS MULTIPLE CIRCUITS WITHIN, LABEL ALL CIRCUITS.

I. REFER TO T-SERIES DRAWINGS FOR SPECIAL SYSTEMS REQUIREMENTS.

PROVIDE BACKBOX(ES), RACEWAY(S) WITH PULLSTRING AND BUSHINGS TO ABOVE ACCESIBLE CEILING REQUIRED FOR ROUGH-IN FOR THE FOLLOWING SYSTEMS:

- SECUTITY (CAMERA'S, CARD READERS, ACCESS CONTROL)
- VOICE/DATA
- A/V

WHERE 120V POWER FOR CONTROLS IS REQUIRED, CONNECT TO NEAREST CIRCUIT SERVING GENERAL PURPOSE RECEPTACLES. COORDINATE REQUIREMENT WITH FINAL SELECTED EQUIPMENT.

## ELECTRICAL KEYED NOTES

E1.1 PROVIDE HUBBELL, FOUR GANG FLOOR BOX. INSTALL ON RAISED FLOOR. MODEL #AFB4G25 WITH SUBPLATES (2) #FBMPDUP, (1) #FBMPBK5, & (1)#FBMPREC. INSTALL 1 DUPLEX RECEPTACLE. COORDINATE DEVICE COVER FINISH AND TYPE WITH ARCHITECT PRIOR TO ORDERING. ROUTE (1) 3/4" CONDUIT FOR POWER, (1) 1" CONDUIT WITH PULLSTRING FOR DATA. ROUTE CONDUIT UNDER RAISED FLOOR FROM FLOOR BOX TO NEAREST WALL AND EXTEND CONDUITS TO ABOVE ACCESSIBLE CEILING. CUT, PATCH AND PAINT EXISTING WALL AND FLOOR AS NECESSARY TO MATCH ADJACENT CONDITIONS. COORDINATE WITH TECHNOLOGY PLANS FOR EXACT DATA/AV FACEPLATES REQUIREMENTS. COORDINATE EXACT LOCATION WITH TENANT/ARCHITECT PRIOR TO ROUGH-IN.

E1.2 PROVIDE HUBBELL, TWO GANG FLOOR BOX MODEL #CFB2G30RCR WITH SUB-PLATES #FBMPDUP & #FBMPBK5. INSTALL 1 DUPLEX RECEPTACLE. COORDINATE DEVICE COVER FINISH WITH ARCHITECT PRIOR TO ORDERING. SAW CUT SLAB AND ROUTE (1) 3/4" CONDUIT FOR POWER & (1) 1" CONDUIT FOR DATA BELOW SLAB. TURN UP IN WALL AND ROUTE TO PLENUM. PATCH SLAB TO MATCH EXISTING. PROVIDE PULL STRING IN DATA CONDUIT. COORDINATE WITH TECHNOLOGY PLANS FOR EXACT DATA/AV FACEPLATES REQUIREMENTS. COORDINATE EXACT LOCATION WITH TENANT/ARCHITECT PRIOR TO ROUGH-IN.

E3.4 PROVIDE GROUND BUS FOR USE BY TELECOM UTILITY.

E3.8 FLUSH BUZZER CONNECTED TO PUSHBUTTON IN JURY DELIBERATION ROOM.

E4.10 PROVIDE AND INSTALL RECEPTACLE AND DATA FOR WALL MOUNTED TV. VERIFY EXACT LOCATION OF TV WITH ARCHITECT PRIOR TO ROUGH-IN.

E5.13 PROVIDE AND INSTALL J-BOXES FOR FUTURE POWER AND DATA UNDER SEATING AREA RAISED FLOOR. RUN (1) 1" CONDUIT FOR POWER AND (1) 1-1/4" FOR DATA. DATA CONDUIT PROVIDED WITH PULLSTRINGS AND ROUTED UNDER RAISED FLOOR AND UP TO CEILING PLENUM.

E5.14 PROVIDE AND INSTALL J-BOX FOR WHEEL CHAIRLIFT. CONNECT TO UNIT AND RAISE/LOWER CONTROL STATIONS.

E5.15 PROVIDE (3) 2" CONDUITS WITH PULLSTRING AND (2) 2" CONDUITS WITH PULLSTRING FROM UNDER RAISED FLOOR TO A/V ROOM.

E5.18 PROVIDE AND INSTALL RECEPTACLE AND DATA AT 18" ON SEATING AREA RUN (1) 1" CONDUIT FOR POWER AND (1) 1-1/4" FOR DATA. DATA CONDUIT PROVIDED WITH PULLSTRINGS. ROUTE CONDUIT FROM PARTIAL WALL TO NEAREST WALL AND EXTEND CONDUITS TO ABOVE ACCESSIBLE CEILING. CUT, PATCH AND PAINT EXISTING WALL AND FLOOR AS NECESSARY TO MATCH ADJACENT CONDITIONS.

| LINE WEIGHT LEGEND | |
|---|---|
| LINE WEIGHT | DESCRIPTION |
| ——— | EXISTING TO REMAIN |
| ——— | NEW |

1 EP2.10 **LEVEL 1 PARTIAL ELECTRICAL POWER PLAN A**
1/8" = 1'-0"

TN PN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DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

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**CONSULTANT**

**REGISTRATION**

10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 05/01/2024 | 100% DESIGN DEVELOPMENT |
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
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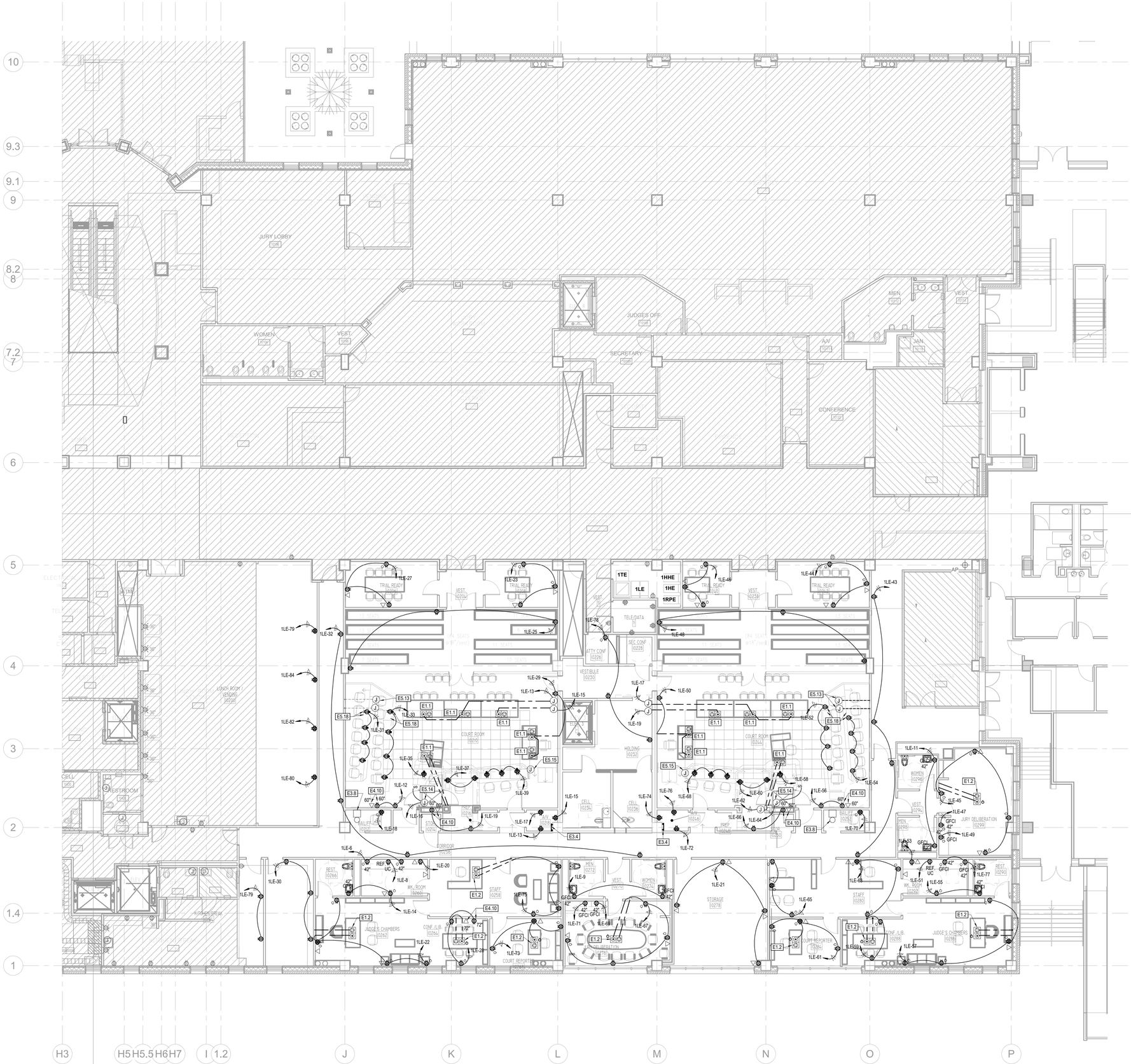
**PROJECT NAME**
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**
1007828.00

**SHEET TITLE**
LEVEL 1 PARTIAL ELECTRICAL POWER PLAN A

**SHEET NUMBER**
EP2.10




1 EP2.11 **LEVEL 1 PARTIAL ELECTRICAL POWER PLAN B**
1/8" = 1'-0"

## POWER GENERAL NOTES:

A. ELECTRICAL DEVICES SHOWN ARE NOT EXACT. ALL DEVICE LOCATIONS SHALL BE VERIFIED WITH ARCHITECTURAL MILLWORK, CASEWORK, AND GENERAL ELEVATION VIEWS.

B. ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT, OUTLET BOXES, JUNCTION BOXES FOR ALL TECHNOLOGY, LOW VOLTAGE, ACCESS CONTROL SECURITY, SURVEILLANCE, AND OTHER DIVISION 27/28 SCOPE. REFER TO DIVISION 27/28 DRAWINGS AND SPECIFICATIONS FOR ALL WORK REQUIRED. OMISSION OF THIS SCOPE FROM DIV 26 SCOPE OF WORK IS PROHIBITED.

C. PROVIDE LABELING OF ALL DEVICES, CONDUIT, PANELS, AND JUNCTION BOXES IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS.

D. MINIMIZE ROOF PENETRATIONS. WHERE ABLE, ROUTE ALL CONDUIT FOR ROOF MOUNTED EQUIPMENT THROUGH ROOF CURB. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING NECESSARY WATER PROOFING AROUND ROOF PENETRATIONS WITH ROOFING INSTALLER.

E. ALL RECEPTACLES LOCATED IN RESTROOMS, JANITOR CLOSETS, MECHANICAL ROOMS, ELEVATOR PITS OR SHAFTS, ELEVATOR EQUIPMENT ROOMS, SERVING ELECTRIC DRINKING FOUNTAINS OR VENDING MACHINES, LOCATED WITHIN 6' OF A SINK, LOCATED ABOVE A WET COUNTERTOP OR IN A KITCHEN OR COFFEE BAR SHALL BE GFCI. FEED-THRU GFCI/GFI IS PROHIBITED. ALL GFCI/GFI DEVICES SHALL BE PROVIDED WITH INDIVIDUAL TEST/RESET FEATURES.

F. MULTI-WIRE HOME RUNS SHALL NOT BE ALLOWED. PROVIDE DEDICATED NEUTRALS FOR ALL CIRCUITS. SHARING CONDUIT IS PERMISSIBLE WHERE TOTAL CONDUCTOR AMPACITY DERATING HAS BEEN PERFORMED BY ELECTRICAL CONTRACTOR. THE NEUTRAL IS CONSIDERED CURRENT-CARRYING.

G. ALL RECEPTACLES SHALL BE TAMPER RESISTANT TYPE. CONTRACTOR MAY PROVIDE NON-TAMPER-RESISTANT RECEPTACLES WHERE NOT REQUIRED PER CURRENT NEC ARTICLE 406

H. LABEL ALL CIRCUITS AT ALL JUNCTION BOXES AND OUTLETS (AS DEFINED BY NEC) WITH TYPE-WRITTEN LABEL IDENTIFYING CIRCUIT ON THE BACK OF DEVICE COVER PLATES OR ON COVER OF JUNCTION BOX. IF A BOX HAS MULTIPLE CIRCUITS WITHIN, LABEL ALL CIRCUITS.

I. REFER TO T-SERIES DRAWINGS FOR SPECIAL SYSTEMS REQUIREMENTS.

PROVIDE BACKBOX(ES), RACEWAY(S) WITH PULLSTRING AND BUSHINGS TO ABOVE ACCESIBLE CEILING REQUIRED FOR ROUGH-IN FOR THE FOLLOWING SYSTEMS:

- SECUTITY (CAMERA'S, CARD READERS, ACCESS CONTROL)
- VOICE/DATA
- A/V

WHERE 120V POWER FOR CONTROLS IS REQUIRED, CONNECT TO NEAREST CIRCUIT SERVING GENERAL PURPOSE RECEPTACLES. COORDINATE REQUIREMENT WITH FINAL SELECTED EQUIPMENT.

## ELECTRICAL KEYED NOTES

E1.1 PROVIDE HUBBELL, FOUR GANG FLOOR BOX. INSTALL ON RAISED FLOOR. MODEL #AFB4G25 WITH SUBPLATES (2) #FBMPDUP, (1) #FBMPBK5, & (1)#FBMPREC. INSTALL 1 DUPLEX RECEPTACLE. COORDINATE DEVICE COVER FINISH AND TYPE WITH ARCHITECT PRIOR TO ORDERING. ROUTE (1) 3/4" CONDUIT FOR POWER, (1) 1" CONDUIT WITH PULLSTRING FOR DATA. ROUTE CONDUIT UNDER RAISED FLOOR FROM FLOOR BOX TO NEAREST WALL AND EXTEND CONDUITS TO ABOVE ACCESSIBLE CEILING. CUT, PATCH AND PAINT EXISTING WALL AND FLOOR AS NECESSARY TO MATCH ADJACENT CONDITIONS. COORDINATE WITH TECHNOLOGY PLANS FOR EXACT DATA/AV FACEPLATES REQUIREMENTS. COORDINATE EXACT LOCATION WITH TENANT/ARCHITECT PRIOR TO ROUGH-IN.

E1.2 PROVIDE HUBBELL, TWO GANG FLOOR BOX MODEL #CFB2G30RCR WITH SUB-PLATES #FBMPDUP & #FBMPBK5. INSTALL 1 DUPLEX RECEPTACLE. COORDINATE DEVICE COVER/FINISH WITH ARCHITECT PRIOR TO ORDERING. SAW CUT SLAB AND ROUTE (1) 3/4" CONDUIT FOR POWER & (1) 1" CONDUIT FOR DATA BELOW SLAB. TURN UP IN WALL AND ROUTE TO PLENUM. PATCH SLAB TO MATCH EXISTING. PROVIDE PULL STRING IN DATA CONDUIT. COORDINATE WITH TECHNOLOGY PLANS FOR EXACT DATA/AV FACEPLATES REQUIREMENTS. COORDINATE EXACT LOCATION WITH TENANT/ARCHITECT PRIOR TO ROUGH-IN.

E3.4 PROVIDE GROUND BUS FOR USE BY TELECOM UTILITY.

E3.8 FLUSH BUZZER CONNECTED TO PUSHBUTTON IN JURY DELIBERATION ROOM.

E4.10 PROVIDE AND INSTALL RECEPTACLE AND DATA FOR WALL MOUNTED TV. VERIFY EXACT LOCATION OF TV WITH ARCHITECT PRIOR TO ROUGH-IN.

E5.13 PROVIDE AND INSTALL J-BOXES FOR FUTURE POWER AND DATA UNDER SEATING AREA RAISED FLOOR. RUN (1) 1" CONDUIT FOR POWER AND (1) 1-1/4" FOR DATA. DATA CONDUIT PROVIDED WITH PULLSTRINGS AND ROUTED UNDER RAISED FLOOR AND UP TO CEILING PLENUM.

E5.14 PROVIDE AND INSTALL J-BOX FOR WHEEL CHAIRLIFT. CONNECT TO UNIT AND RAISE/LOWER CONTROL STATIONS.

E5.15 PROVIDE (3) 2" CONDUITS WITH PULLSTRING AND (2) 2" CONDUITS WITH PULLSTRING FROM UNDER RAISED FLOOR TO A/V ROOM.

E5.18 PROVIDE AND INSTALL RECEPTACLE AND DATA AT 18" ON SEATING AREA RUN (1) 1" CONDUIT FOR POWER AND (1) 1-1/4" FOR DATA. DATA CONDUIT PROVIDED WITH PULLSTRINGS. ROUTE CONDUIT FROM PARTIAL WALL TO NEAREST WALL AND EXTEND CONDUITS TO ABOVE ACCESSIBLE CEILING. CUT, PATCH AND PAINT EXISTING WALL AND FLOOR AS NECESSARY TO MATCH ADJACENT CONDITIONS.

### LINE WEIGHT LEGEND

| LINE WEIGHT | DESCRIPTION |
|---|---|
| ——— | EXISTING TO REMAIN |
| ——— | NEW |

TN PN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TBPE Firm Registration No. 2234


DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

**CLIENT**

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**CONSULTANT**

**REGISTRATION**

REGISTERED ARCHITECT RONALD HOCHSTEIN 13118 STATE OF TEXAS

10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 05/01/2024 | 100% DESIGN DEVELOPMENT |
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTUCTION DOCUMENTS |
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**
1007828.00

**SHEET TITLE**
LEVEL 1 PARTIAL ELECTRICAL POWER PLAN B

**SHEET NUMBER**
EP2.11

## HVAC POWER GENERAL NOTES:

A. HVAC AND PLUMBING EQUIPMENT LOCATIONS ARE NOT EXACT, AND THE EXACT POINT OF CONNECTION TO EQUIPMENT MAY VARY. COORDINATE EXACT ROUGH-IN REQUIREMENTS IN FIELD AND WITH FINAL SUBMITTALS FOR ALL DIV. 21/22/23 EQUIPMENT.

B. PROVIDE LABELING OF ALL DEVICES, CONDUIT, PANELS, AND JUNCTION BOXES IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS.

C. MINIMIZE ROOF PENETRATIONS. WHERE ABLE, ROUTE ALL CONDUIT FOR ROOF MOUNTED EQUIPMENT THROUGH ROOF CURB. CONTRACTOR WILL BE RESPONSIBLE FOR COORDINATING NECESSARY WATER PROOFING AROUND ROOF PENETRATIONS WITH ROOFING INSTALLER.

D. MULTI-WIRE HOME RUNS SHALL NOT BE ALLOWED. PROVIDE DEDICATED NEUTRALS FOR ALL CIRCUITS. SHARING CONDUIT IS PERMISSIBLE WHERE TOTAL CONDUCTOR AMPACITY DERATING HAS BEEN PERFORMED BY ELECTRICAL CONTRACTOR. THE NEUTRAL IS CONSIDERED CURRENT-CARRYING.

E. LABEL ALL CIRCUITS AT ALL JUNCTION BOXES AND OUTLETS (AS DEFINED BY NEC) WITH TYPE-WRITTEN LABEL IDENTIFYING CIRCUIT ON THE BACK OF DEVICE COVER PLATES OR ON COVER OF JUNCTION BOX. IF A BOX HAS MULTIPLE CIRCUITS WITHIN, LABEL ALL CIRCUITS.

F. PROVIDE AND INSTALL 3/4" CONDUIT WITH PULLSTRING FROM FPT UNIT TO CORRESPONDING THERMOSTAT FOR CONTROLS. COORDINATE WITH MECHANICAL PLANS FOR EXACT LOCATION OF THERMOSTATS PRIOR TO ROUGH-IN.

## ELECTRICAL KEYED NOTES

E5.17 MAKE CONNECTIONS TO ELECTRIC WATER HEATER WITH 2#10, 1#10G IN 3/4"C. COORDINATE WITH PLUMBING PLANS FOR EXACT LOCATION PRIOR TO ROUGH-IN.

| LINE WEIGHT LEGEND | |
|---|---|
| LINE WEIGHT | DESCRIPTION |
| ——— | EXISTING TO REMAIN |
| ——— | NEW |

# 1 LEVEL 1 PARTIAL ELECTRICAL HVAC POWER PLAN A

EP3.10 1/8" = 1'-0"

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**CONSULTANT**

**REGISTRATION**

STATE OF TEXAS ROMAIN MATRUS 131169 LICENSED PROFESSIONAL ENGINEER

10/17/2024

**DRAWING HISTORY**

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**PROJECT NAME**

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**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

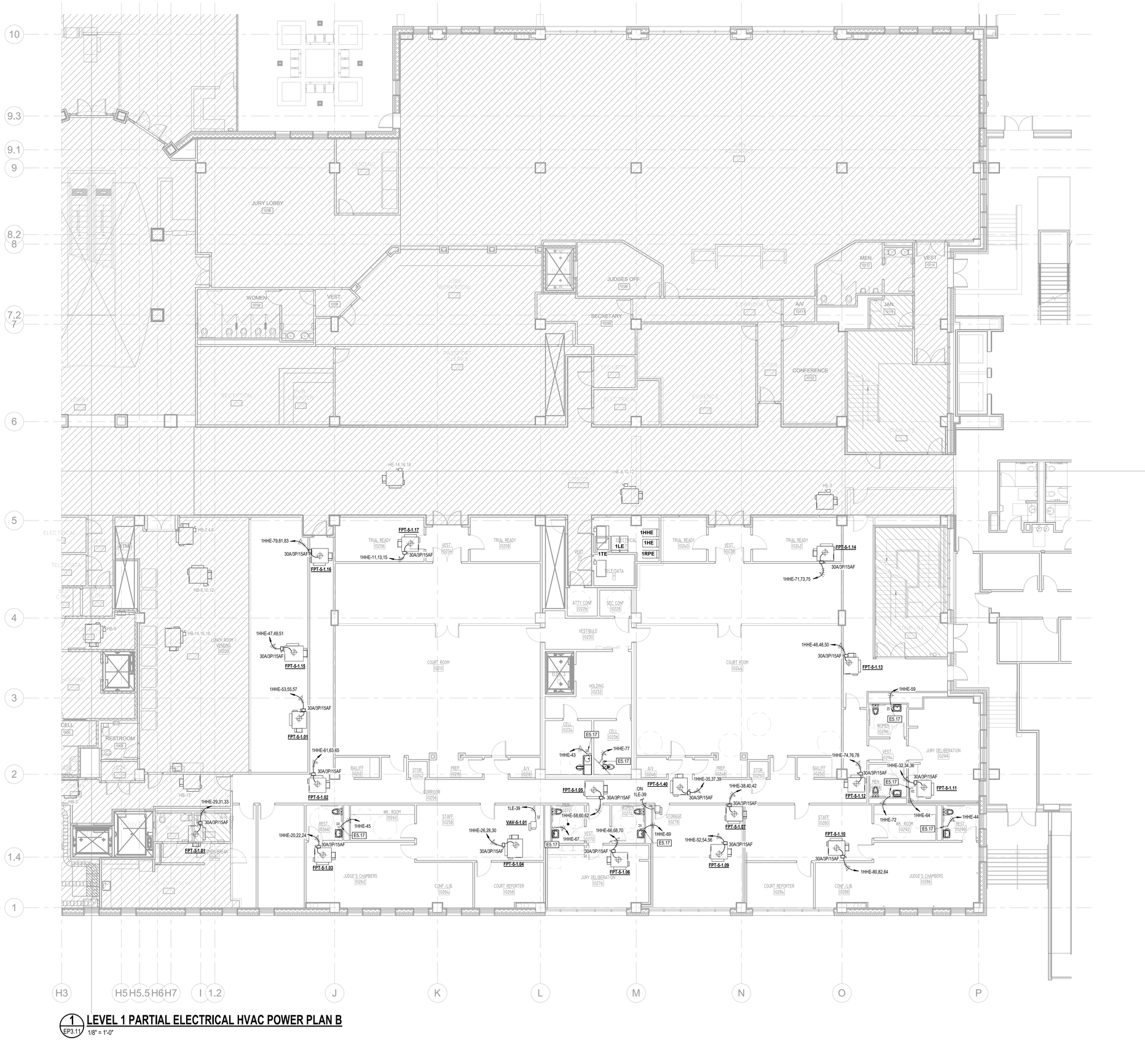
1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL ELECTRICAL HVAC POWER PLAN A

**SHEET NUMBER**

EP3.10




1 EP3.11 **LEVEL 1 PARTIAL ELECTRICAL HVAC POWER PLAN B**

1/8" = 1'-0"

## HVAC POWER GENERAL NOTES:

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## ☐ ELECTRICAL KEYED NOTES

E5.17 MAKE CONNECTIONS TO ELECTRIC WATER HEATER WITH 2#10, 1#10G IN 3/4"C. COORDINATE WITH PLUMBING PLANS FOR EXACT LOCATION PRIOR TO ROUGH-IN.

| LINE WEIGHT LEGEND | |
|---|---|
| LINE WEIGHT | DESCRIPTION |
| ——— | EXISTING TO REMAIN |
| ——— | NEW |


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ROMAN MATRUS 131169 LICENSED PROFESSIONAL ENGINEER

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RICHMOND, TX 77469

**PROJECT NUMBER**

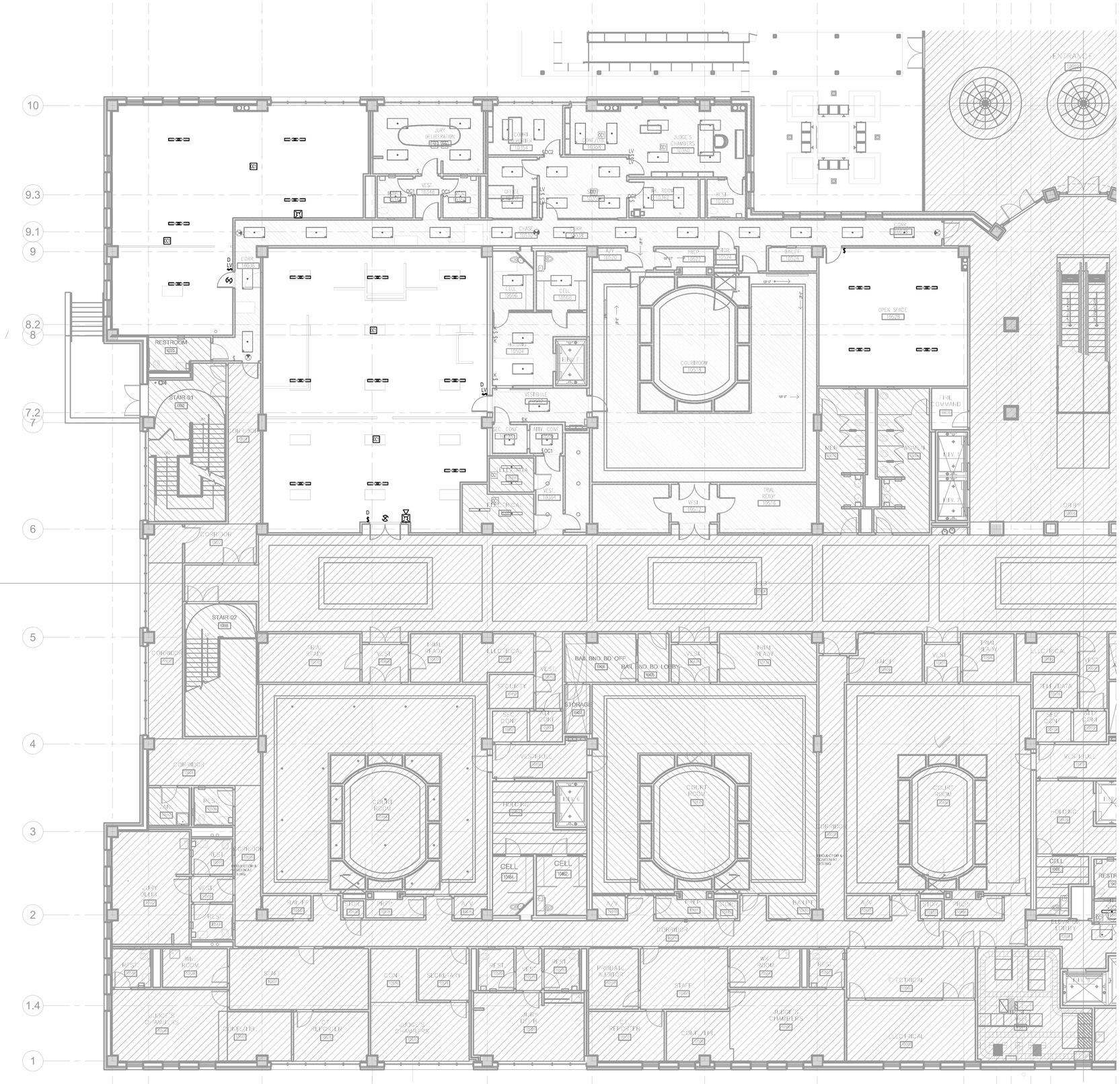
1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL ELECTRICAL HVAC POWER PLAN B

**SHEET NUMBER**

EP3.11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VEST.
OFFICE
CHASE
CORR.
A/V
PREP.
STOR.
BAILIFF
CELL
RESTROOM
STAIR 01
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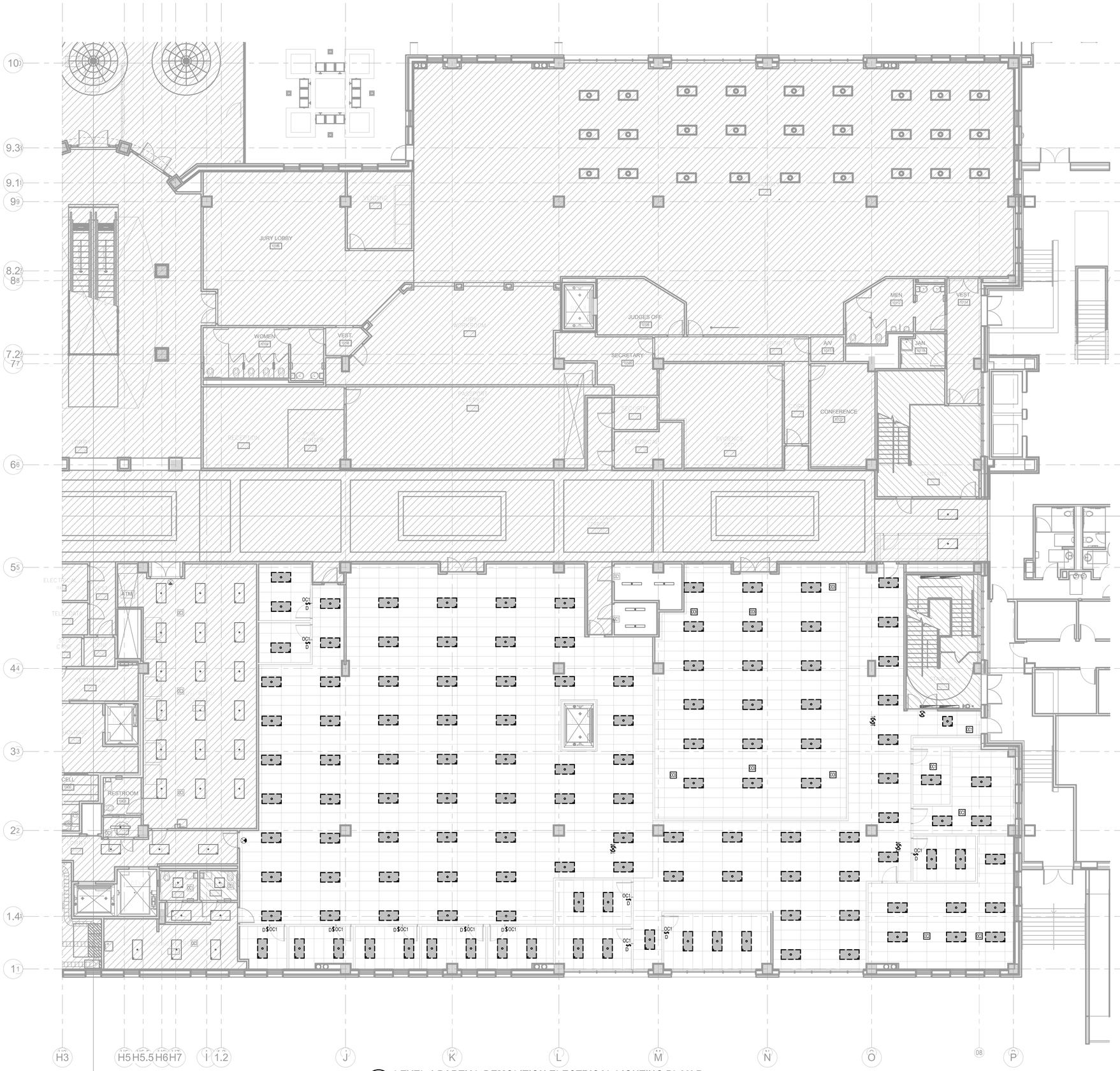


## GENERAL LIGHTING DEMOLITION NOTES:

A. ALL LIGHT CIRCUIT SHALL BE DEMOLISHED AS REQUIRED BY THE DEMOLITION SCOPE ON THE DOCUMENTS. REPAIR ANY CIRCUITS THAT ARE PARTIALLY DEMOLISHED AND CONTAIN LIGHTS THAT ARE 'NOT IN SCOPE' OR OUTSIDE OF THE LIMITS OF CONSTRUCTION TO WORKING CONDITION. PROVIDE CONDUIT AND BOXES AS NEEDED.

B. MODIFIED LIGHTING CIRCUITS SHALL NOT EXCEED 80% CIRCUIT LOAD BASED ON CIRCUIT AMPACITY.

C. ALL FIRE ALARM CONTRACTORS ARE RESPONSIBLE FOR VISITING THE SITE AND VERIFYING THE EXISTING FIRE ALARM SYSTEM AND SCOPE OF WORKED REQUIRED PER PLANS AND SPECIFICATIONS, PRIOR TO BEDDING. VISIBLE EXISTING SITE CONDITIONS, MAKE AND MODEL OF CURRENT FIRE ALARM SYSTEM, NECESSITY OF ANY FRONT-END UPGRADES, CODE COMPLIANCE OF EXISTING DEVICES LOCATED WITHIN THE SCOPE OF WORK AREA, IS ASSUMED TO BE KNOWN BY FIRE ALARM CONTRACTOR UPON DESIGN OF FIRE ALARM SHOP DRAWINGS.

D. ALL LIGHT CIRCUIT SHALL BE DEMOLISHED AS REQUIRED BY THE DEMOLITION SCOPE ON THE DOCUMENTS. REPAIR ANY CIRCUITS THAT ARE PARTIALLY DEMOLISHED AND CONTAIN LIGHTS THAT ARE 'NOT IN SCOPE' OR OUTSIDE OF THE LIMITS OF CONSTRUCTION TO WORKING CONDITION. PROVIDE CONDUIT AND BOXES AS NEEDED.

E. MODIFIED LIGHTING CIRCUITS SHALL NOT EXCEED 80% CIRCUIT LOAD BASED ON CIRCUIT AMPACITY.

## 1 LEVEL 1 PARTIAL DEMOLITION ELECTRICAL LIGHTING PLAN B

ELD2.11 — 1/8" = 1'-0"

| LINE WEIGHT LEGEND | |
|---|---|
| LINE WEIGHT | DESCRIPTION |
| ——— | EXISTING TO REMAIN |
| - - - - - - - | EXISTING TO BE REMOVED |

TN PN


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**CONSULTANT**

**REGISTRATION**

STATE OF TEXAS ROMAN MATRUS 131169 LICENSED PROFESSIONAL ENGINEER

10/17/2024

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**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE RICHMOND, TX 77469

**PROJECT NUMBER**

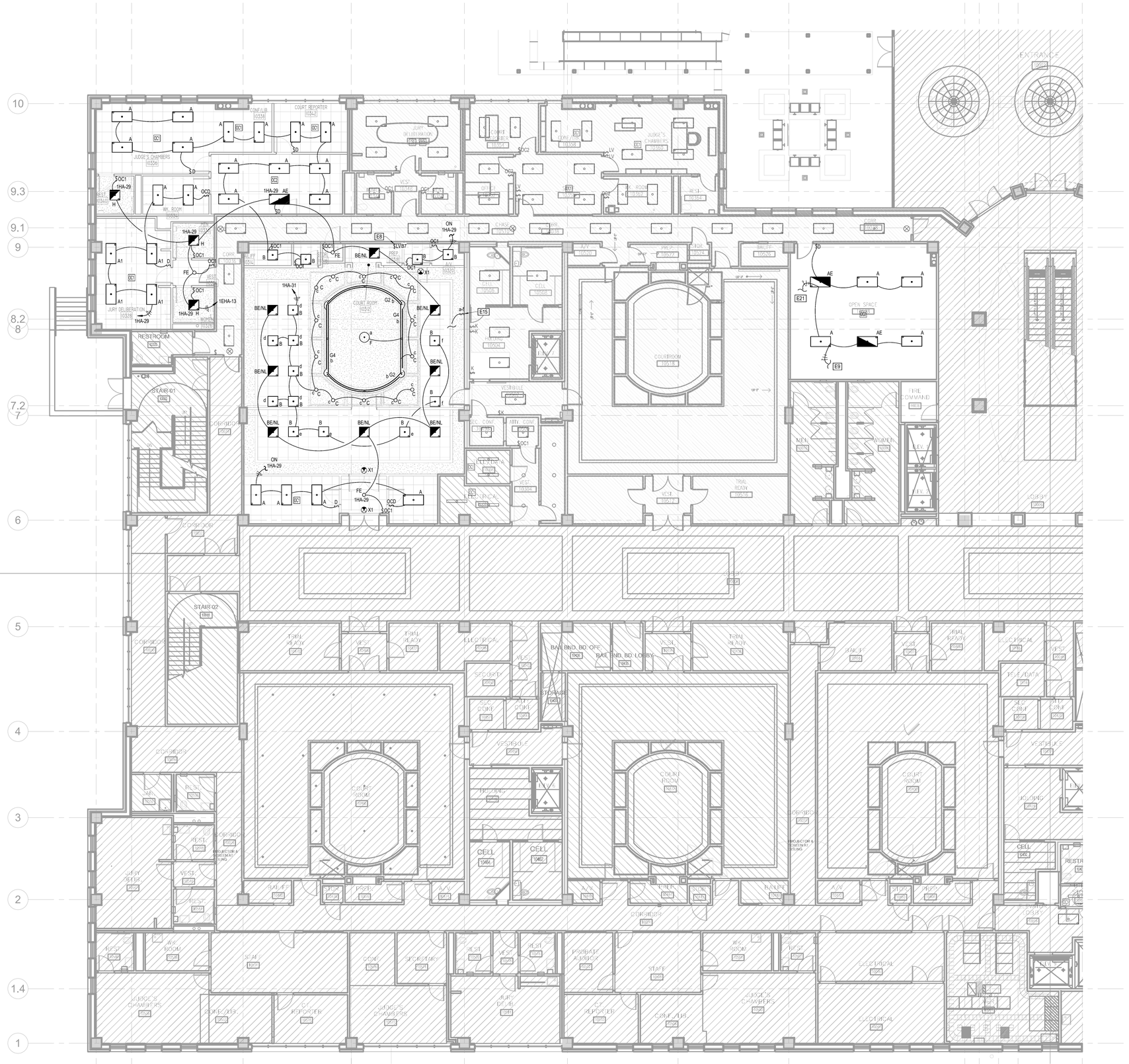
1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL DEMOLITION ELECTRICAL LIGHTING PLAN B

**SHEET NUMBER**

ELD2.11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10018
COURT REPORTER
10342
JUDGE'S CHAMBERS
10336
JURY DELIBERATION
10328
REST ROOM
10340
REST ROOM
10339
CONF/LIB.
10338
JURY DELIBERATION
10330
JURY ASSEMBLY
10329
RESTROOM
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STAIR-01
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CORRIDOR
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STAIR-02
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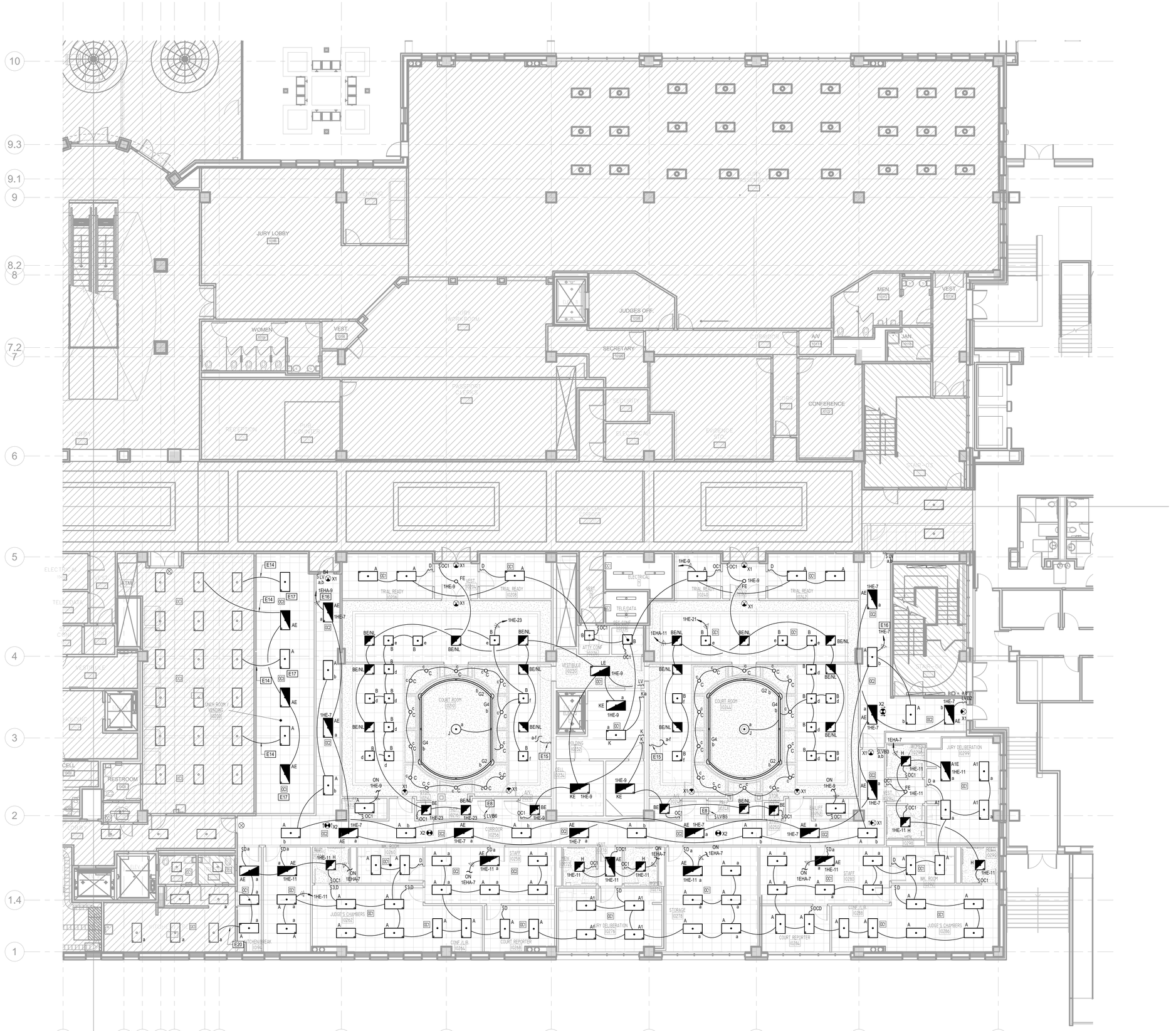


1 EL2.11 **LEVEL 1 PARTIAL ELECTRICAL LIGHTING PLAN B**
1/8" = 1'-0"

## LIGHTING GENERAL NOTES:

A. CONTROL DEVICES SHALL BE PROVIDED IN ACCORDANCE WITH PERFORMANCE DESCRIPTION INDICATED IN THE LIGHTING CONTROL DEVICE SCHEDULE FOUND ON SCHEDULE SHEETS.

B. MULTIPLE SWITCHES SHOWN TOGETHER SHALL BE GANGED UNDER A COMMON COVER PLATE.

C. PROVIDE LABELING OF ALL CONTROL DEVICES, SWITCH PACKS, LIGHT FIXTURES, JUNCTION BOXES, ETC IN ACCORDANCE WITH ELECTRICAL SPECIFICATIONS.

D. LIGHTING FIXTURE LOCATIONS SHOWN TAKE PRECEDENT IN CEILING LOCATION TO ALL OTHER TRADES. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ENSURING OTHER TRADES DO NOT IMPACT SPACING AND/OR OVERLAYMENT OF OTHER DEVICES WHERE LIGHT FIXTURES MUST BE INSTALLED.

E. REFERENCE SYMBOLS LEGEND FOR LIGHT SWITCH DEVICE NOMENCLATURE AND SWITCH-LEG ASSOCIATIONS.

F. ALL 2X2, 2X4 FIXTURES INSTALLED IN SUSPENDED GRID CEILING SHALL BE PROVIDED WITH (2) SECONDARY SUPPORT WIRES ANCHORED DIRECTLY TO STRUCTURE.

G. EXPANSION AND MODIFICATION OF FIRE ALARM SYSTEMS IS PERFORMANCE BASED. RE: SPECIFICATION 28 31 00. PROVIDE DEVICES REQUIRED TO PROVIDE A COMPLETE WORKING SYSTEM PER MANUFACTURER'S RECOMMENDATIONS AND NFPA APPROVED METHODS.

## EMER. LIGHTING GENERAL NOTES:

A. ROUTE AN UNSWITCHED HOT LEG TO ALL LIGHT FIXTURES DESIGNATED AS EMERGENCY FIXTURES. HOT LEG SHALL ORIGINATE FROM CIRCUIT SERVING NORMAL LIGHTING FIXTURES IN THAT SPACE. UNSWITCHED HOT LEG SHALL CONNECT TO THE NORMAL POWER SENSING LUG ON THE GTD DEVICE. REFER TO GTD WIRING DIAGRAM ON SHEET XXX FOR ADDITIONAL INFORMATION.

B. ALL EMERGENCY LIGHT FIXTURE GENERATOR TRANSFER DEVICES SHALL BE CONNECTED TO THE EMERGENCY EGRESS LIGHTING CIRCUIT INDICATED ON DRAWINGS. ALL EMERGENCY WIRING SHALL BE ROUTED IN A SEPARATE CONDUIT.

C. PROVIDE UNSWITCHED CIRCUIT TO ALL EXIT SIGNS ORIGINATING FROM CIRCUIT NEAREST EMERGENCY CIRCUIT.

## ELECTRICAL KEYED NOTES

E8 MASTER OVERRIDE COURTROOM LIGHTING CONTROL STATION. REFER TO 3/E6.03.

E14 CONNECT TO EXISTING LIGHTING CONTROL AND CIRCUIT AS SHOWN.

E15 REFER TO DETAIL 2/E6.03 FOR MULTI-GANG SWITCH REQUIREMENTS.

E16 LIGHTING CIRCUIT TO BE CONTROLLED BY EXISTING RELAY PANEL RPE. REFER TO SHEET E6.03.

E17 INTERCONNECT NEW CEILING SENSORS WITH EXISTING SENSORS IN THIS AREA.

E20 CONNECT TO EXISTING LIGHTING CIRCUIT AS SHOWN.

| LINE WEIGHT LEGEND | |
|---|---|
| LINE WEIGHT | DESCRIPTION |
| ——— | EXISTING TO REMAIN |
| ——— | NEW |

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10/17/2024

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**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

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1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

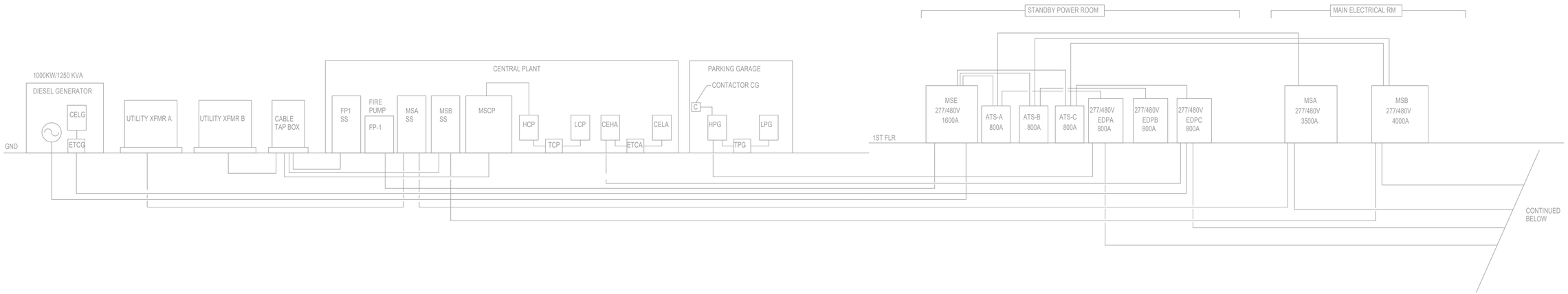
1007828.00

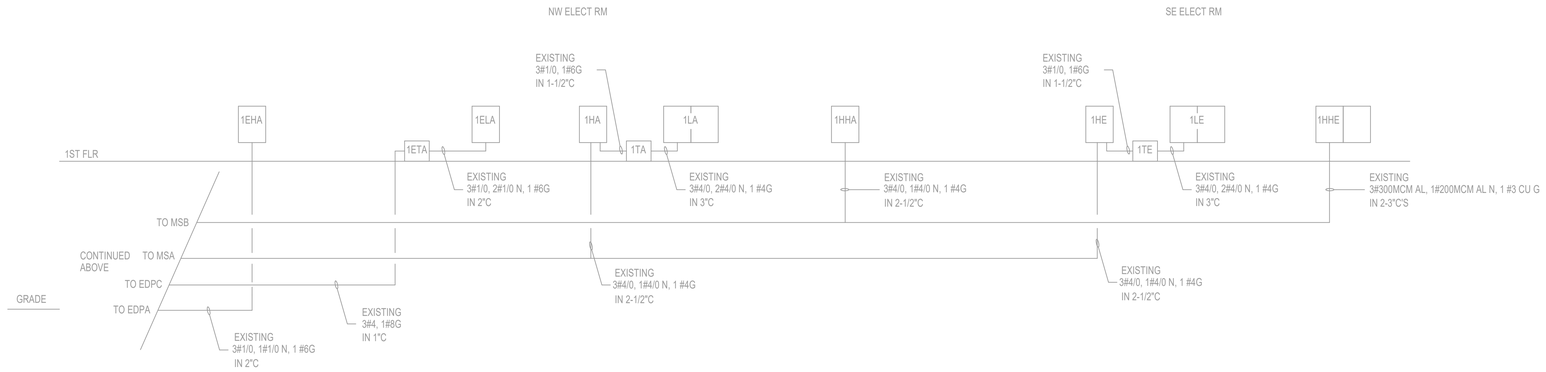
**SHEET TITLE**

LEVEL 1 PARTIAL ELECTRICAL LIGHTING PLAN B

**SHEET NUMBER**

EL2.11




## 1 E4.01 POWER RISER DIAGRAM

NOT TO SCALE

**MSA Load Analysis - Renovation**

480 / 277 , 3 -PHASE, 4 -WIRE 3500A — Date: 7/17/2024

| DESCRIPTION | | | | | NEC | KVA |
|---|---|---|---|---|---|---|
| EXISTING LOADS: | | | | | | |
| ESTIMATED EXISTING DEMAND LOAD = | 1,913,000 | VA | X | 1.25 | | 2391.3 |
| EXISTING LOAD REMOVED = | 0 | VA | | | | 0.0 |
| NEW LOADS: | | | | | | |
| LIGHTING: | | | | | | |
| INTERIOR = | 7,400 | VA | X | 1.25 | | 9.3 |
| POWER: | | | | | | |
| | | | | RECEPTACLES= 40,800 | | |
| FIRST 10,000: | | | 10,000 | X 100% | 220.44 | 10.0 |
| REMAINDER: | | | 30,800 | X 50% | | 15.4 |
| | | | | | TOTAL = | 2425.9 |
| | | | | | TOTAL AMPS: | 2917.9 |
| | | | | | SERVICE SIZE: | 3500.0 |
| | | | | | SPARE AMPACITY: | 582.1 |

**MSB Load Analysis - Renovation**

480 / 277 , 3 -PHASE, 4 -WIRE 4000A — Date: 7/17/2024

| DESCRIPTION | | | | NEC | KVA |
|---|---|---|---|---|---|
| EXISTING LOADS: | | | | | |
| ESTIMATED EXISTING DEMAND LOAD = | 1,985,000 | VA | X 1.25 | | 2481.3 |
| EXISTING LOAD REMOVED = | 78,780 | VA | | | -78.8 |
| NEW LOADS: | | | | | |
| HVAC: | | | | | |
| HVAC= | 169,147 | VA | | | 169.1 |
| 25% LARGEST MOTOR = | 2,000 | VA | | | 2.0 |
| | | | | TOTAL = | 2573.6 |
| | | | | TOTAL AMPS: | 3095.6 |
| | | | | SERVICE SIZE: | 4000.0 |
| | | | | SPARE AMPACITY: | 904.4 |

**MSE Load Analysis - Renovation**

480 / 277 , 3 -PHASE, 4 -WIRE 1600A — Date: 7/17/2024

| DESCRIPTION | | | | NEC | KVA |
|---|---|---|---|---|---|
| EXISTING LOADS: | | | | | |
| ESTIMATED EXISTING DEMAND LOAD = | 832,000 | VA | X 1.25 | | 1040.0 |
| EXISTING LOAD REMOVED = | 0 | VA | | | 0.0 |
| NEW LOADS: | | | | | |
| LIGHTING: | | | | | |
| INTERIOR = | 5,100 | VA | X 1.25 | | 6.4 |
| | | | | TOTAL = | 1046.4 |
| | | | | TOTAL AMPS: | 1258.6 |
| | | | | SERVICE SIZE: | 1600.0 |
| | | | | SPARE AMPACITY: | 341.4 |

## ONE-LINE DIAGRAM GENERAL NOTES:

A. MANUFACTURER OF ELECTRICAL GEAR SHALL PROVIDE A COORDINATION STUDY FOR THE ENTIRE ELECTRICAL SYSTEM IN ORDER TO SET BREAKERS. REFER TO SPECIFICATIONS. MANUFACTURER SHALL ALSO PROVIDE A FAULT CIRCUIT STUDY FOR THE ENTIRE ELECTRICAL SYSTEM IN ORDER TO SELECT INTERRUPTING RATINGS OF ALL CIRCUIT BREAKERS, DISTRIBUTION PANELBOARDS, PANELBOARDS, ETC. A FULLY RATED SYSTEM SHALL BE USED.

B. METERING EQUIPMENT ENCLOSURE PROVIDED BY POWER CO., INSTALLED BY ELECTRICAL CONTRACTOR PER POWER COMPANY SPECIFICATIONS. METERS INSTALLED BY POWER COMPANY.

C. ALL CONDUCTORS SHALL BE COPPER.

D. CONTRACTOR SHALL INSTALL FEEDERS BASED ON THE OVERCURRENT DEVICE RATING UNLESS OTHERWISE NOTED. CONTRACTOR SHALL REFER TO THE FEEDER SCHEDULE TO OBTAIN AND INSTALL THE FEEDERS REQUIRED.

E. SERVICE EQUIPMENT IN OTHER THAN DWELLING UNITS SHALL BE LEGIBLY MARKED IN THE FIELD WITH THE MAXIMUM AVAILABLE FAULT CURRENT AT THE TIME OF INSTALLATION AND CALCULATION. THE LABEL SHALL BE 2" X 3" IN SIZE AND SHALL BE BLUE LETTERING ON A CONTRASTING BACKGROUND. THIS LABEL SHALL ALSO INCLUDE THE DATE OF THE CALCULATION.

F. PRIOR TO INSTALLATION OF UNDERGROUND FEEDERS, THE ELECTRICAL CONTRACTOR SHALL SUBMIT AN UNDERGROUND ROUTING PLAN TO THE ENGINEER OF RECORD., INDICATING THE EXACT ROUTING PATH FOR ALL UNDERGROUND CONDUIT. INDICATE STUB-UP LOCATIONS, SIZE AND QUANTITY OF CONDUIT. ALL ELECTRICAL PANELS AND EQUIPMENT SHALL BE SHOWN ON THIS PLAN FOR REFERENCE OF CONDUIT TERMINATION.

G. DIVISION 26 INSTALLER SHALL COORDINATE NEW ELECTRICAL SERVICE WITH UTILITY COMPANY. PROVIDE CONDUIT, TRANSFORMER PAD, AND TAP BOX, WHERE REQUIRED. ALL NEW UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY SPECIFICATIONS.


DBR
9990 Richmond Avenue
South Building, Suite 300
Houston, Texas 77042
713.914.0888 p 713.914.0886 f
TBPE Firm Registration No. 2234


DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

**CLIENT**

FORT BEND COUNTY

301 JACKSON ST.
RICHMOND, TX 77469
T 281-342-3411

**ARCHITECT**


PGAL, Inc.
3131 Briarpark Dr.
Suite 200
Houston, TX 77042
T 713 622 1444
F 713 622 1444
www.pgal.com


**CONSULTANT**

**REGISTRATION**

ROMAIN MATHUR 13116 LICENSED PROFESSIONAL ENGINEER

10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 05/01/2024 | 100% DESIGN DEVELOPMENT |
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTUCTION DOCUMENTS |
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

1007828.00

**SHEET TITLE**

POWER RISER DIAGRAM

**SHEET NUMBER**

E4.01

## Panelboard 1HA

65,000 AIC Rating
X Existing
New

277/480 Volt,3-Phase,4-Wire
1 Section
1 -Nema Rating

X MCB MLO 225 AMP MCB AMP BUS (Copper)

X Single Double Feed - Thru

Mounting X Surface Flush

| Notes | Load (VA) | Description | Type | Wire | CB | CKT # | PH | CKT # | CB | Wire | Type | Description | Load (VA) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2500 | LTG - CLERKS | L | 12 | 20/1 | 1 | A | 2 | 20/1 | 12 | L | LTG - OFFICES | 2500 | |
| | 1800 | LTG - CLERKS | L | 12 | 20/1 | 3 | B | 4 | 20/1 | 12 | L | SPARE | | |
| | 2400 | LTG - CLERKS | L | 12 | 20/1 | 5 | C | 6 | 20/1 | 12 | L | LTG - MAIN CORR. | 1500 | |
| | | SPARE | | | 20/1 | 7 | A | 8 | 20/1 | 12 | L | LTG - MAIN CORR. | 1760 | |
| | | SPARE | | | 20/1 | 9 | B | 10 | 20/1 | | | SPARE | | |
| | 280 | LTG - EXTERIOR | EL | 12 | 20/1 | 11 | C | 12 | 20/1 | 12 | L | LTG - TOILETS | 800 | |
| | | SPARE | | | 20/1 | 13 | A | 14 | 20/1 | | | SPARE | | |
| | | SPARE | | | 20/1 | 15 | B | 16 | 20/1 | | | SPARE | | |
| | | SPARE | | | 20/1 | 17 | C | 18 | 20/1 | | | SPARE | | |
| | 3000 | EWH-1 | WH | 12 | 20/1 | 19 | A | 20 | 20/1 | 12 | WH | IWH-1 | 4100 | |
| | 3000 | EWH-1 | WH | 12 | 20/1 | 21 | B | 22 | 20/1 | 12 | WH | IWH-1 | 4100 | |
| | 3000 | EWH-1 | WH | 12 | 20/1 | 23 | C | 24 | 20/1 | 12 | WH | IWH-1 | 4100 | |
| | 4155 | IWH-2 | WH | 12 | 20/1 | 25 | A | 26 | 20/1 | 12 | WH | IWH-1 | 4100 | |
| | 4155 | IWH-3 | WH | 12 | 20/1 | 27 | B | 28 | 20/1 | 12 | WH | IWH-1 | 4100 | |
| | ***1500*** | ***LIGHTING*** | ***L*** | ***12*** | ***20/1*** | 29 | C | 30 | | | | SPACE | | |
| | ***400*** | ***LIGHTING*** | ***L*** | ***12*** | ***20/1*** | 31 | A | 32 | | | | SPACE | | |
| | | SPACE | | | | 33 | B | 34 | | | | SPACE | | |
| | | SPACE | | | | 35 | C | 36 | | | | SPACE | | |
| | | XFMR 1TA | | 1 | 125/3 | 37 | A | 38 | | | | SPACE | | |
| | | - | | 1 | | 39 | B | 40 | | | | SPACE | | |
| | | - | | 1 | | 41 | C | 42 | | | | SPACE | | |
| | 26,190 | Subtotal | | | | | | | | | | Subtotal | 27,060 | |

| N.E.C. | Load Type | Conn. | Fct. | Diversity | N.E.C. | | Conn. | Fct. | Diversity |
|---|---|---|---|---|---|---|---|---|---|
| 220.44 | (R) Recept. | 0 | | 0 | 210.20(a) | (L) Lighting | 15,160 | 125% | 18,950 |
| 220.56 | (K) Kitchen | 0 | 100% | 0 | | (EL) Ext. Ltg. | 280 | 125% | 350 |
| 220.60 | (C) Cooling | 0 | 0% | 0 | 620.14 | (E) Elevators | 0 | 100% | 0 |
| 220.60 | (H) Heating | 0 | 0% | 0 | | (WH) Water Ht. | 37,810 | 100% | 37,810 |
| 220.60 | (F) Fans | 0 | 100% | 0 | 220.50 | (MT) Lrg. Mot. | 0 | 125% | 0 |
| | (M) Misc. | 0 | 100% | 0 | | (SP) Sub Panel | 0 | 100% | 0 |

Total Connected Load = 53,250 VA = 64.1 AMPS
Total Load (Diversified)= 57,110 VA = 68.7 AMPS

Location of Panel:
NOTES:
***BOLD ITALIC INDICATES NEW REQUIREMENT.***
***MAINTAIN ACTIVE CIRCUITS NOT INTENDED TO BE DEMOLISHED - FIELD CONFIRM.***

## Panelboard 1HHA

65,000 AIC Rating
X Existing
New

277/480 Volt,3-Phase,4-Wire
1 Section
1 -Nema Rating

X MCB MLO 225 AMP MCB AMP BUS (Copper)

X Single Double Feed - Thru

Mounting X Surface Flush

| Notes | Load (VA) | Description | Type | Wire | CB | CKT # | PH | CKT # | CB | Wire | Type | Description | Load (VA) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***5904*** | ***FPT-1-1.01 & 02*** | ***H*** | ***4#10*** | ***30/3*** | 1 | A | 2 | 20/3 | 12 | H | FPTU-CH | 2330 | |
| | ***5904*** | ***-*** | ***H*** | ***1-10G*** | ***-*** | 3 | B | 4 | - | - | H | | 2330 | |
| | ***5904*** | ***-*** | ***H*** | | ***-*** | 5 | C | 6 | - | - | H | | 3460 | |
| | ***8200*** | ***WATER HEATERS*** | ***WH*** | | ***40/1*** | 7 | A | 8 | ***25/3*** | ***4#10*** | ***H*** | ***FPT-1-1.05 & 06*** | ***4904*** | |
| | 5830 | FPTU-BH | H | 10 | 30/1 | 9 | B | 10 | ***-*** | ***1-10G*** | ***H*** | ***-*** | ***4904*** | |
| | ***8200*** | ***WATER HEATERS*** | ***WH*** | | ***40/1*** | 11 | C | 12 | ***-*** | | ***H*** | ***-*** | ***4904*** | |
| | 5830 | FPTU-AH | H | 10 | 30/1 | 13 | A | 14 | 20/3 | ***4#10*** | ***H*** | ***FPT-1-1.07 & 08*** | ***3784*** | |
| | 5830 | FPTU-AH | H | 10 | 20/1 | 15 | B | 16 | - | ***1-10G*** | ***H*** | ***-*** | ***3784*** | |
| | 4990 | FPTU-BH | H | 12 | 20/3 | 17 | C | 18 | - | - | H | | 3784 | |
| | 3333 | - | H | - | - | 19 | A | 20 | 20/3 | 12 | H | FPTU-CH | 2330 | |
| | 3333 | - | H | - | - | 21 | B | 22 | - | - | H | | 2330 | |
| | | SPARE | H | - | 20/1 | 23 | C | 24 | - | - | H | | 3460 | |
| | 4666 | FPTU-DH | H | 10 | 30/3 | 25 | A | 26 | 20/3 | 12 | H | FPTU-CH | 2330 | |
| | 6230 | - | H | - | - | 27 | B | 28 | - | - | H | | 2330 | |
| | 4666 | - | H | - | - | 29 | C | 30 | - | - | H | | 3460 | |
| | ***4118*** | ***FPT-1-1.03 & 04*** | ***H*** | ***4#10*** | 20/3 | 31 | A | 32 | 30/3 | 10 | H | FPTU-DH | 4900 | |
| | ***4118*** | ***-*** | ***H*** | ***1-10G*** | - | 33 | B | 34 | - | - | H | | 3333 | |
| | ***4118*** | ***-*** | ***H*** | - | - | 35 | C | 36 | - | - | H | | 3333 | |
| | 3000 | FPTU-CH | H | 12 | 20/3 | 37 | A | 38 | 30/3 | 10 | H | FPTU-DH | 4660 | |
| | 3000 | - | H | - | - | 39 | B | 40 | - | - | H | | 4660 | |
| | 4130 | - | H | - | - | 41 | C | 42 | - | - | H | | 6230 | |
| | 101,304 | Subtotal | | | | | | | | | | Subtotal | 77,540 | |

| N.E.C. | Load Type | Conn. | Fct. | Diversity | N.E.C. | | Conn. | Fct. | Diversity |
|---|---|---|---|---|---|---|---|---|---|
| 220.44 | (R) Recept. | 0 | | 0 | 210.20(a) | (L) Lighting | 0 | 125% | 0 |
| 220.56 | (K) Kitchen | 0 | 100% | 0 | | (EL) Ext. Ltg. | 0 | 125% | 0 |
| 220.60 | (C) Cooling | 0 | 0% | 0 | 620.14 | (E) Elevators | 0 | 100% | 0 |
| 220.60 | (H) Heating | 178,844 | 100% | 178,844 | | (WH) Water Ht. | 0 | 100% | 0 |
| 220.60 | (F) Fans | 0 | 100% | 0 | 220.50 | (MT) Lrg. Mot. | 0 | 125% | 0 |
| | (M) Misc. | 0 | 100% | 0 | | (SP) Sub Panel | 0 | 100% | 0 |

Total Connected Load = 178,844 VA = 215.2 AMPS
Total Load (Diversified)= 178,844 VA = 215.2 AMPS

Location of Panel:
NOTES:
***BOLD ITALIC INDICATES NEW REQUIREMENT.***
***MAINTAIN ACTIVE CIRCUITS NOT INTENDED TO BE DEMOLISHED - FIELD CONFIRM.***

## LIGHTING FIXTURE SCHEDULE

| TYPE | DESCRIPTION | MANUFACTURER | MODEL NUMBER | VOLTAGE | LAMP | VA | REMARKS |
|---|---|---|---|---|---|---|---|
| A | 2x4 ARCHITECTURAL RECESSED LED * | TECHLIGHT | L2PT24 40 4L 1 12 W | 120/277 | LED | 35 | |
| AE | 2x4 ARCHITECTURAL RECESSED LED * | TECHLIGHT | L2PT24 40 4L 1 12 W | 120/277 | LED | 35 | PROVIDE GENERATOR TRANSFER DEVICE |
| A1 | 2x4 ARCHITECTURAL RECESSED LED | TECHLIGHT | L2PT24 40 5L 1 12 W | 120/277 | LED | 40 | |
| A1E | 2x4 ARCHITECTURAL RECESSED LED | TECHLIGHT | L2PT24 40 5L 1 12 W | 120/277 | LED | 40 | PROVIDE GENERATOR TRANSFER DEVICE |
| B | 2X2 ARCHITECTURAL RECESSED LED | TECHLIGHT | L2PT22 40 5L 1 6 W | 120/277 | LED | 34 | |
| BE | 2X2 ARCHITECTURAL RECESSED LED | TECHLIGHT | L2PT22 40 5L 1 6 W | 120/277 | LED | 34 | PROVIDE GENERATOR TRANSFER DEVICE |
| BE/NL | 2X2 ARCHITECTURAL RECESSED LED | TECHLIGHT | L2PT22 40 5L 1 6 W | 120/277 | LED | 34 | |
| C | DOWNLIGHT LED ** | GREENCREATIVE | INFT 6 8 40 DIM010UNV | 120/277 | LED | 9 | |
| FE | DOWNLIGHT LED | GREENCREATIVE | INFT 6 8 40 DIM010UNV | 120/277 | LED | 9 | PROVIDE GENERATOR TRANSFER DEVICE |
| G2 | STRIP LED **** | KELVIX | SW3SHO-20"-40K-HZ-E-S-IP68 | 120/277 | LED | 92 | |
| G4 | STRIP LED **** | KELVIX | SW3SHO-14"-40K-HZ-E-S-IP68 | 120/277 | LED | 64 | |
| H | 2X2 ARCHITECTURAL RECESSED LED ** | METALUX | 22PD-40-PP3-L840-U / DF-22W-U | 120/277 | LED | 34 | PROVIDE GENERATOR TRANSFER DEVICE |
| J | PENDANT LED | SPI | AIP8429 L115W[CBA] 120-277V 4000K OAH 63.5 | 120/277 | LED | 115 | COLOR BY ARCHITECT |
| K | 2x4 ARCHITECTURAL RECESSED LED | KURTZON | VL-R-4-2X4-2LEDR-840-UNV-6-2-AH | 120/277 | LED | 55 | |
| KE | 2x4 ARCHITECTURAL RECESSED LED ** | KURTZON | VL-S-4-2X4-2LEDR-840-UNV-6-2-AH GTD | 120/277 | LED | 55 | PROVIDE GENERATOR TRANSFER DEVICE |
| LE | 2x4 ARCHITECTURAL RECESSED LED | KURTZON | VL-R-4-2X4-2LEDR-840-UNV-6-2-AH GTD | 120/277 | LED | 55 | PROVIDE GENERATOR TRANSFER DEVICE |
| X1 | EXIT SIGN | EVENLITE | TLP-R-2U-W | 277 | LED | | CONTRACTOR TO CONFIRM SINGLE OR DOUBLE FACE SIGNAGE, AND ARROWS, ALSO CONFIRM ALL RECESSED MOUNT LOCATIONS. |
| X2 | EXIT SIGN | EVENLITE | TLP-R-2U-W | 277 | LED | | CONTRACTOR TO CONFIRM SINGLE OR DOUBLE FACE SIGNAGE, AND ARROWS, ALSO CONFIRM ALL RECESSED MOUNT LOCATIONS. |

NOTES:
* IF RE-USE STORED 2X4 LIGHT FIXTURE. PROVIDE LAMP: L48T5/840/25G-IDD DE
** PROVIDE HARD CEILING ADAPTER KIT
***ALL LIGHT FIXTURES SHALL BE COMPLETE AND WITH EARTHQUAKE CLIPS INSTALLED, PER NEC 410.36
****PROVIDE ALL ACCESSORIES AS NECESSARY. A DRIVER IS REQUIRED EVERY 20'.

## Panelboard 1LA

10,000 AIC Rating
X Existing
New

120/208 Volt,3-Phase,4-Wire
1 Section
1 -Nema Rating

X MCB MLO 225 AMP MCB AMP BUS (Copper)

X Single Double X Feed - Thru

Mounting X Surface Flush

| Notes | Load (VA) | Description | Type | Wire | CB | CKT # | PH | CKT # | CB | Wire | Type | Description | Load (VA) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ***720*** | ***C.T. REP. RECEPTS.*** | ***R*** | ***12*** | 20/1 | 1 | A | 2 | 20/1 | ***12*** | ***R*** | ***A/V RECPTS.*** | ***360*** | |
| | ***900*** | ***STAFF RECPTS.*** | ***R*** | ***12*** | 20/1 | 3 | B | 4 | 20/1 | ***12*** | ***R*** | ***A/V RECPTS.*** | ***360*** | |
| | ***540*** | ***CONF/LIB RECPTS.*** | ***R*** | ***12*** | 20/1 | 5 | C | 6 | 20/1 | ***12*** | ***R*** | ***A/V RECPTS.*** | ***360*** | |
| | ***720*** | ***JUDG'S RECPTS.*** | ***R*** | ***12*** | 20/1 | 7 | A | 8 | 20/1 | ***12*** | ***R*** | ***PREP RECPTS.*** | ***360*** | |
| | ***540*** | ***WK. RM. RECPTS.*** | ***R*** | ***12*** | 20/1 | 9 | B | 10 | 20/1 | ***12*** | ***R*** | ***COURT RM. RECPTS.*** | ***180*** | |
| | ***360*** | ***WK. RM. RECPTS.*** | ***R*** | ***12*** | 20/1 | 11 | C | 12 | 20/1 | ***12*** | ***R*** | ***WHEELCHAIR LIFT*** | ***500*** | |
| | ***800*** | ***WK. RM. RECPT.*** | ***R*** | ***12*** | 20/1 | 13 | A | 14 | 20/1 | ***12*** | ***R*** | ***COURT RM. RECPTS.*** | ***1080*** | |
| | ***300*** | ***COPY*** | ***R*** | ***12*** | 20/1 | 15 | B | 16 | 20/1 | ***12*** | ***R*** | ***COURT RM. RECPTS.*** | ***720*** | |
| | ***720*** | ***JURY DELIB RECPTS.*** | ***R*** | ***12*** | 20/1 | 17 | C | 18 | 20/1 | ***12*** | ***R*** | ***COURT RM. RECPT.*** | ***360*** | |
| | ***180*** | ***JURY DELIB RECPT.*** | ***R*** | ***12*** | 20/1 | 19 | A | 20 | 20/1 | 12 | R | COURT BAILIFF | 720 | |
| | ***180*** | ***JURY DELIB RECPT.*** | ***R*** | ***12*** | 20/1 | 21 | B | 22 | 20/1 | 12 | R | COURT LAWYERS | 1080 | |
| | ***360*** | ***BAILIFF RECPTS.*** | ***R*** | ***12*** | 20/1 | 23 | C | 24 | 20/1 | 12 | R | HOLDING | 540 | |
| | 1200 | JURY DELIB COFFEE | R | 12 | 20/1 | 25 | A | 26 | 20/1 | 12 | R | COURT JUDGE | 720 | |
| | 1200 | JURY DELIB MICRO | R | 12 | 20/1 | 27 | B | 28 | 20/1 | 12 | R | COURT CLERK | 1080 | |
| | 1080 | JURY DELIB COFFEE | R | 12 | 20/1 | 29 | C | 30 | 20/1 | 12 | R | COURT WITNESS | 1080 | |
| | 720 | STAFF | R | 12 | 20/1 | 31 | A | 32 | 20/1 | 12 | R | COURT A/V RM. | 360 | |
| | 720 | PROBATION | R | 12 | 20/1 | 33 | B | 34 | 20/1 | 12 | R | COURT A/V RM. | 360 | |
| | 720 | BAILIFF | R | 12 | 20/1 | 35 | C | 36 | 20/1 | 12 | R | COURT A/V RM. | 360 | |
| | 720 | COURT JURY | R | 12 | 20/1 | 37 | A | 38 | 100/3 | 4 #1 | SP | TVSS | 0 | |
| | 720 | COURT JURY | R | 12 | 20/1 | 39 | B | 40 | - | 1 #8G | SP | - | | |
| | | SPARE | | | 20/1 | 41 | C | 42 | - | | SP | - | | |
| | ***540*** | ***STAFF RECPTS.*** | ***R*** | ***12*** | 20/1 | 43 | A | 44 | 20/1 | ***12*** | ***R*** | ***TRIAL READY RECPTS.*** | ***720*** | |
| | ***360*** | ***COURT RM. RECPTS.*** | ***R*** | ***12*** | 20/1 | 45 | B | 46 | 20/1 | ***12*** | ***R*** | ***TRIAL READY RECPTS.*** | ***720*** | |
| | ***360*** | ***COURT RM. RECPTS.*** | ***R*** | ***12*** | 20/1 | 47 | C | 48 | 20/1 | ***12*** | ***R*** | ***COURT RM. RECPTS.*** | ***900*** | |
| | 750 | A/V - REPTRS | R | 12 | 20/1 | 49 | A | 50 | 20/1 | ***12*** | ***R*** | ***COURT RM. RECPTS.*** | ***720*** | |
| | 1200 | KIT - COFFEE | R | 12 | 20/1 | 49 | A | 50 | 20/1 | 12 | R | WORKRM COFFEE M. | 1200 | |
| | ***180*** | ***VAV-1-1.01*** | ***R*** | ***12*** | 20/1 | 51 | B | 52 | 20/1 | ***12*** | ***R*** | ***COURT RM. RECPTS.*** | ***720*** | |
| | | SPARE | | | 20/1 | 53 | C | 54 | 20/1 | 12 | R | WORK/JUDGE/TOIL | 540 | |
| | | SPARE | | | 20/1 | 55 | A | 56 | 20/1 | 12 | R | WORKRM LIC REF. | 600 | |
| | 540 | REC- VAULT | R | 12 | 20/1 | 57 | B | 58 | 20/1 | 12 | R | COURT RM. MONITOR | 600 | |
| | 540 | REC- DIV SUPER. | R | 12 | 20/1 | 59 | C | 60 | 20/1 | 12 | R | WORKRM. PRINTER | 1000 | |
| | ***720*** | ***COURT RM. RECPTS.*** | ***R*** | ***12*** | 20/1 | 61 | A | 62 | 20/1 | 12 | R | COURT/TRIAL READY | 900 | |
| | ***720*** | ***TRIAL RD. RECPTS.*** | ***R*** | ***12*** | 20/1 | 63 | B | 64 | 20/1 | 12 | R | COURT/TRIAL READY | 1080 | |
| | ***360*** | ***RESTROOMS RECPT.*** | ***R*** | ***12*** | 20/1 | 65 | C | 66 | 20/1 | 12 | R | REC- LEKTREVER | 1000 | |
| | | SPARE | | | 20/1 | 67 | A | 68 | 20/1 | 12 | R | REC- CORR | 1080 | |
| | | SPARE | | | 20/1 | 69 | B | 70 | 20/1 | 12 | R | MAIN CORRIDOR | 720 | |
| | 540 | REC- CORR | R | 12 | 20/1 | 71 | C | 72 | 20/1 | 12 | R | REC- CORR & EXT | 900 | |
| | 540 | REC- LOBBY | R | 12 | 20/1 | 73 | A | 74 | 20/1 | 12 | R | WHEELCHAIR LIFT | 500 | |
| | 500 | EWC | R | 12 | 20/1 | 75 | B | 76 | 20/1 | 12 | R | PROJTR. & SCREEN | 600 | |
| | ***720*** | ***COURT RM. RECPTS.*** | ***R*** | ***12*** | 20/1 | 77 | C | 78 | 20/1 | 12 | R | VIDEO MONITOR | 600 | |
| | ***720*** | ***COURT RM. RECPTS.*** | ***R*** | ***12*** | 20/1 | 79 | A | 80 | 20/1 | 12 | R | REC- LOBBY | 360 | |
| | ***540*** | ***COURT RM. RECPTS.*** | ***R*** | ***12*** | 20/1 | 81 | B | 82 | 20/1 | | | SPARE | | |
| | ***900*** | ***COURT RM. RECPTS.*** | ***R*** | ***12*** | 20/1 | 83 | C | 84 | 20/1 | 12 | R | REC- TOILETS | 360 | |
| | 24,130 | Subtotal | | | | | | | | | | Subtotal | 25,980 | |

| N.E.C. | Load Type | Conn. | Fct. | Diversity | N.E.C. (2005) | | Conn. | Fct. | Diversity |
|---|---|---|---|---|---|---|---|---|---|
| 220.44 | (R) Recept. | 49,930 | | 29,965 | 210.20(a) | (L) Lighting | 0 | 125% | 0 |
| 220.56 | (K) Kitchen | 0 | 100% | 0 | | (EL) Ext. Ltg. | 0 | 125% | 0 |
| 220.60 | (C) Cooling | 0 | 0% | 0 | 620.14 | (E) Elevators | 0 | 100% | 0 |
| 220.60 | (H) Heating | 180 | 100% | 180 | | (WH) Water Ht. | 0 | 100% | 0 |
| 220.60 | (F) Fans | 0 | 100% | 0 | 220.50 | (MT) Lrg. Mot. | 0 | 125% | 0 |
| | (M) Misc. | 0 | 100% | 0 | | (SP) Sub Panel | 0 | 100% | 0 |

Total Connected Load = 50,110 VA = 139.2 AMPS
Total Load (Diversified)= 30,145 VA = 83.7 AMPS

Location of Panel:
NOTES:
***BOLD ITALIC INDICATES NEW REQUIREMENT.***
***MAINTAIN ACTIVE CIRCUITS NOT INTENDED TO BE DEMOLISHED - FIELD CONFIRM.***

## Panelboard 1HHE

10,000 AIC Rating
X Existing
New

277/480 Volt,3-Phase,4-Wire
1 Section
1 -Nema Rating

X MCB MLO 400 AMP MCB AMP BUS (Copper)

X Single Double X Feed - Thru

Mounting X Surface Flush

| Notes | Load (VA) | Description | Type | Wire | CB | CKT # | PH | CKT # | CB | Wire | Type | Description | Load (VA) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 3830 | FPTU-AH | H | | 20/1 | 1 | A | 2 | 20/3 | 4#12 | H | FPTU-CH | 2000 | |
| | 6830 | FPTU-BH | H | 8 | 40/1 | 3 | B | 4 | - | 1#12G | H | | 2000 | |
| | ***SPARE*** | | | | 30/1 | 5 | C | 6 | - | | H | | 3130 | |
| | ***SPARE*** | | | | 30/1 | 7 | A | 8 | 20/3 | 4#12 | H | FPTU-CH | 2000 | |
| | 5830 | FPTU-BH | H | 10 | 30/1 | 9 | B | 10 | - | 1#12G | H | | 3130 | |
| | ***2119*** | ***FPT-5-1.17*** | ***H*** | ***4#12*** | ***15/3*** | 11 | C | 12 | - | | H | | 2000 | |
| | ***2119*** | | ***H*** | ***1#12G*** | ***-*** | 13 | A | 14 | 20/3 | 4#12 | H | FPTU-CH | 3130 | |
| | ***2119*** | | ***H*** | | ***-*** | 15 | B | 16 | - | 1#12G | H | | 2000 | |
| | | SPARE | | | | 17 | C | 18 | | | H | | 2032 | |
| | | EXISTING | | | 30/3 | 19 | A | 20 | ***15/3*** | ***4#12*** | ***H*** | ***FPT-5-1.03*** | ***2332*** | |
| | | | | | - | 21 | B | 22 | ***-*** | ***1#12G*** | ***H*** | | ***2332*** | |
| | | EXISTING | | | 30/3 | 23 | C | 24 | ***-*** | | ***H*** | | ***2332*** | |
| | | | | | - | 25 | A | 26 | ***15/3*** | ***4#12*** | ***H*** | ***FPT-5-1.04*** | ***2452*** | |
| | | | | | | 27 | B | 28 | ***-*** | ***1#12G*** | ***H*** | | ***2452*** | |
| | ***3119*** | ***FPT-3-1.01*** | ***H*** | ***4#12*** | ***15/3*** | 29 | C | 30 | ***-*** | | ***H*** | | ***2452*** | |
| | ***3119*** | | ***H*** | ***1#12G*** | ***-*** | 31 | A | 32 | ***15/3*** | ***4#12*** | ***H*** | ***FPT-5-1.11*** | ***2952*** | |
| | ***3119*** | | ***H*** | | ***-*** | 33 | B | 34 | ***-*** | ***1#12G*** | ***H*** | | ***2952*** | |
| | ***2785*** | ***FPT-5-1.08*** | ***H*** | ***4#12*** | ***15/3*** | 35 | C | 36 | ***-*** | | ***H*** | | ***2952*** | |
| | ***2785*** | | ***H*** | ***1#12G*** | ***-*** | 37 | A | 38 | ***15/3*** | ***4#12*** | ***H*** | ***FPT-5-1.07*** | ***2119*** | |
| | ***2785*** | | ***H*** | | ***-*** | 39 | B | 40 | ***-*** | ***1#12G*** | ***H*** | | ***2119*** | |
| | | SPACE | | | | 41 | C | 42 | ***-*** | | ***H*** | | ***2119*** | |
| | ***4100*** | ***WATER HEATER*** | ***H*** | ***#12*** | ***20/1*** | 43 | A | 44 | ***20/1*** | ***#12*** | ***H*** | ***WATER HEATER*** | ***4000*** | |
| | ***4100*** | ***WATER HEATER*** | ***H*** | ***#12*** | ***20/1*** | 45 | B | 46 | ***15/3*** | ***4#12*** | ***H*** | ***FPT-5-1.13*** | ***2119*** | |
| | ***2785*** | ***FPT-5-1.15*** | ***H*** | ***4#12*** | ***15/3*** | 47 | C | 48 | ***-*** | ***1#12G*** | ***H*** | | ***2119*** | |
| | ***2785*** | | ***H*** | ***1#12G*** | ***-*** | 49 | A | 50 | ***-*** | | ***H*** | | ***2119*** | |
| | ***2785*** | | ***H*** | | ***-*** | 51 | B | 52 | ***15/3*** | ***4#12*** | ***H*** | ***FPT-5-1.09*** | ***2332*** | |
| | ***3119*** | ***FPT-5-1.01*** | ***H*** | ***4#12*** | ***15/3*** | 53 | C | 54 | ***-*** | ***1#12G*** | ***H*** | | ***2332*** | |
| | ***3119*** | | ***H*** | ***1#12G*** | ***-*** | 55 | A | 56 | ***-*** | | ***H*** | | ***2332*** | |
| | ***3119*** | | ***H*** | | ***-*** | 57 | B | 58 | ***15/3*** | ***4#12*** | ***H*** | ***FPT-5-1.05*** | ***2332*** | |
| | ***4100*** | ***WATER HEATER*** | ***H*** | ***#12*** | ***20/1*** | 59 | C | 60 | | ***1#12G*** | ***H*** | | ***2332*** | |
| | ***2452*** | ***FPT-5-1.02*** | ***H*** | ***4#12*** | ***15/3*** | 61 | A | 62 | | | ***H*** | | ***2332*** | |
| | ***2452*** | | ***H*** | ***1#12G*** | ***-*** | 63 | B | 64 | ***20/1*** | ***#12*** | ***H*** | ***WATER HEATER*** | ***4000*** | |
| | ***2452*** | | ***H*** | | ***-*** | 65 | C | 66 | ***15/3*** | ***4#12*** | ***H*** | ***FPT-5-1.06*** | ***2452*** | |
| | ***4100*** | ***WATER HEATER*** | ***H*** | ***#12*** | ***20/1*** | 67 | A | 68 | ***-*** | ***1#12G*** | ***H*** | | ***2452*** | |
| | ***4100*** | ***WATER HEATER*** | ***H*** | ***#12*** | ***20/1*** | 69 | B | 70 | ***-*** | | | | ***2452*** | |
| | ***1332*** | ***FPT-5-1.14*** | ***H*** | ***4#12*** | ***15/3*** | 71 | C | 72 | ***20/1*** | ***#12*** | ***H*** | ***WATER HEATER*** | ***4000*** | |
| | ***1332*** | | ***H*** | ***1#12G*** | ***-*** | 73 | A | 74 | ***15/3*** | ***4#12*** | ***H*** | ***FPT-5-1.12*** | ***2452*** | |
| | ***1332*** | | ***H*** | | ***-*** | 75 | B | 76 | ***-*** | ***1#12G*** | ***H*** | | ***2452*** | |
| | ***4100*** | ***WATER HEATER*** | ***H*** | ***#12*** | ***20/1*** | 77 | C | 78 | ***-*** | | ***H*** | | ***2452*** | |
| | ***2119*** | ***FPT-5-1.16*** | ***H*** | ***4#12*** | ***15/3*** | 79 | A | 80 | ***15/3*** | ***4#12*** | ***H*** | ***FPT-5-1.10*** | ***2952*** | |
| | ***2119*** | | ***H*** | ***1#12G*** | ***-*** | 81 | B | 82 | | ***1#12G*** | ***H*** | | ***2952*** | |
| | ***2119*** | | ***H*** | | ***-*** | 83 | C | 84 | ***-*** | | | | ***2952*** | |
| | 100,580 | Subtotal | | | | | | | | | | Subtotal | 106,872 | |

| N.E.C. | Load Type | Conn. | Fct. | Diversity | N.E.C. (2005) | | Conn. | Fct. | Diversity |
|---|---|---|---|---|---|---|---|---|---|
| 220.44 | (R) Recept. | 0 | | 0 | 210.20(a) | (L) Lighting | 14,920 | 125% | 18,650 |
| 220.56 | (K) Kitchen | 0 | 100% | 0 | | (EL) Ext. Ltg. | 0 | 125% | 0 |
| 220.60 | (C) Cooling | 0 | 0% | 0 | 620.14 | (E) Elevators | 0 | 100% | 0 |
| 220.60 | (H) Heating | 0 | 0% | 0 | | (WH) Water Ht. | 0 | 100% | 0 |
| 220.60 | (F) Fans | 0 | 100% | 0 | 220.50 | (MT) Lrg. Mot. | 0 | 125% | 0 |
| | (M) Misc. | 0 | 100% | 0 | | (SP) Sub Panel | 0 | 100% | 0 |

Total Connected Load = 14,920 VA = 18.0 AMPS
Total Load (Diversified)= 18,650 VA = 22.4 AMPS

Location of Panel:
NOTES:
***BOLD ITALIC INDICATES NEW REQUIREMENT.***
***MAINTAIN ACTIVE CIRCUITS NOT INTENDED TO BE DEMOLISHED - FIELD CONFIRM.***

## Panelboard 1HE

10,000 AIC Rating
X Existing
New

277/480 Volt,3-Phase,4-Wire
1 Section
1 -Nema Rating

X MCB MLO 225 AMP MCB AMP BUS (Copper)

X Single X Double Feed - Thru

Mounting X Surface Flush

| Notes | Load (VA) | Description | Type | Wire | CB | CKT # | PH | CKT # | CB | Wire | Type | Description | Load (VA) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | SPARE | | | 20/1 | 1 | A | 2 | 20/1 | | L | LTG- RECEPTION/ OFF | | |
| | 2800 | LTG- FILES/CONF | L | | 20/1 | 3 | B | 4 | 20/1 | | L | LTG- OFFICES | | |
| | 1500 | LTG- CLERKS | L | | 20/1 | 5 | C | 6 | 20/1 | | L | LTG- CLERKS | | |
| | ***2000*** | ***LIGHTING*** | ***L*** | ***12*** | 20/1 | 7 | A | 8 | 20/1 | | L | LTG- CLERKS | | |
| | ***1600*** | ***LIGHTING*** | ***L*** | ***12*** | 20/1 | 9 | B | 10 | 20/1 | | L | LTG- CLERKS | | |
| | ***2300*** | ***LIGHTING*** | ***L*** | ***12*** | 20/1 | 11 | C | 12 | 20/1 | | | SPARE | | |
| | | lighting | | | | 13 | A | 14 | | | | SPACE | | |
| | | SPACE | | | | 15 | B | 16 | | | | SPACE | | |
| | | SPACE | | | | 17 | C | 18 | | | | SPACE | | |
| | 3000 | EWH-1 | | R | 20/1 | 19 | A | 20 | | | | SPACE | | |
| | ***400*** | ***LIGHTING*** | ***L*** | ***12*** | 20/1 | 21 | B | 22 | | | | SPACE | | |
| | ***400*** | ***LIGHTING*** | ***L*** | ***12*** | 20/1 | 23 | C | 24 | | | | SPACE | | |
| | | SPACE | | | | 25 | A | 26 | | | | SPACE | | |
| | | SPACE | | | | 27 | B | 28 | | | | SPACE | | |
| | | SPACE | | | | 29 | C | 30 | | | | SPACE | | |
| | | SPACE | | | | 31 | A | 32 | | | | SPACE | | |
| | | SPACE | | | | 33 | B | 34 | | | | SPACE | | |
| | | SPACE | | | | 35 | C | 36 | | | | SPACE | | |
| | | XFMR 1TE & PNL 1LE | | | 20/1 | 37 | A | 38 | | | | SPACE | | |
| | | | | | 20/1 | 39 | B | 40 | | | | SPACE | | |
| | | | | | 20/1 | 41 | C | 42 | | | | SPACE | | |
| | 21,500 | Subtotal | | | | | | | | | | Subtotal | 0 | |

| N.E.C. | Load Type | Conn. | Fct. | Diversity | N.E.C. (2005) | | Conn. | Fct. | Diversity |
|---|---|---|---|---|---|---|---|---|---|
| 220.44 | (R) Recept. | 43,400 | | 26,700 | 210.20(a) | (L) Lighting | 0 | 125% | 0 |
| 220.56 | (K) Kitchen | 0 | 100% | 0 | | (EL) Ext. Ltg. | 0 | 125% | 0 |
| 220.60 | (C) Cooling | 0 | 0% | 0 | 620.14 | (E) Elevators | 0 | 100% | 0 |
| 220.60 | (H) Heating | 360 | 100% | 360 | | (WH) Water Ht. | 0 | 100% | 0 |
| 220.60 | (F) Fans | 0 | 100% | 0 | 220.50 | (MT) Lrg. Mot. | 0 | 125% | 0 |
| | (M) Misc. | 0 | 100% | 0 | | (SP) Sub Panel | 0 | 100% | 0 |

Total Connected Load = 43,760 VA = 121.6 AMPS
Total Load (Diversified)= 27,060 VA = 75.2 AMPS

Location of Panel:
NOTES:
***BOLD ITALIC INDICATES NEW REQUIREMENT.***
***MAINTAIN ACTIVE CIRCUITS NOT INTENDED TO BE DEMOLISHED - FIELD CONFIRM.***

## Panelboard 1LE

10,000 AIC Rating
X Existing
New

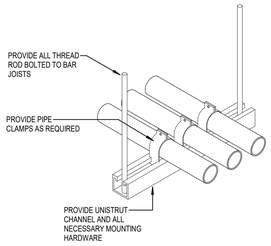
120/208 Volt,3-Phase,4-Wire
1 Section
1 -Nema Rating

X MCB MLO 225 AMP MCB AMP BUS (Copper)

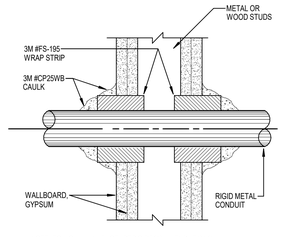
X Single X Double Feed - Thru

Mounting X Surface Flush

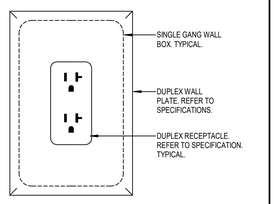
| Notes | Load (VA) | Description | Type | Wire | CB | CKT # | PH | CKT # | CB | Wire | Type | Description | Load (VA) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 540 | REC-OFFICE MGR | R | | 20/1 | 1 | A | 2 | 20/1 | 12 | R | REC- FILES | 1080 | |
| | 720 | REC-MAIL | R | | 20/1 | 3 | B | 4 | 20/1 | 12 | R | REC- SEC | 360 | |
| | 720 | REC-CORRIDOR | R | | 20/1 | 5 | C | 6 | 20/1 | ***12*** | ***R*** | ***WK. RM. RECPTS.*** | ***360*** | |
| | 540 | REC- CORRIDOR | R | | 20/1 | 7 | A | 8 | 20/1 | ***12*** | ***R*** | ***WK. RM. RECPTS.*** | ***800*** | |
| | ***360*** | ***RESTROOM RECPTS.*** | ***R*** | ***12*** | 20/1 | 9 | B | 10 | 20/1 | 12 | R | REC- STG/ CORRIDOR | 720 | |
| | ***360*** | ***RESTROOM RECPTS.*** | ***R*** | ***12*** | 20/1 | 11 | C | 12 | 20/1 | ***12*** | ***R*** | ***COURT RM. RECPTS.*



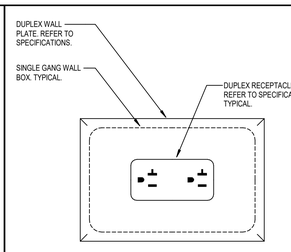

**1 UNISTRUT CONDUIT DETAIL**
NOT TO SCALE
E10003



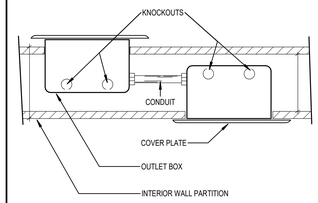

**2 2 HR. GYPSUM WALLBOARD PIPE PENETRATION**
NOT TO SCALE
E10017



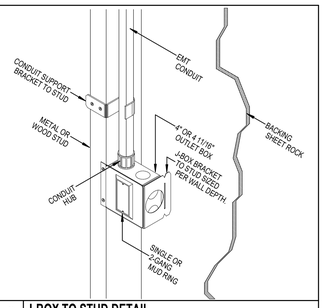

**3 TYPICAL RECEPTACLE MOUNTING DETAIL**
NOT TO SCALE
E13018



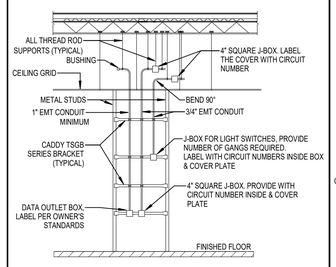

**4 HORIZONTAL RECEPTACLE MOUNTING DETAIL**
NOT TO SCALE
E13016



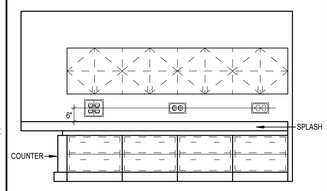

**5 BACK-TO-BACK OUTLETS**
NOT TO SCALE
E13022



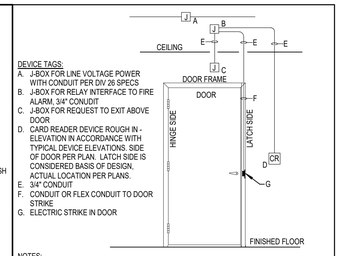

**6 J-BOX TO STUD DETAIL**
NOT TO SCALE
E13030




**7 CONDUIT ROUGH-IN DETAIL**
NOT TO SCALE
E24002




**8 TYPICAL COUNTERTOP DEVICE ELEVATION**
NOT TO SCALE
E13009




**9 CARD READER ROUGH-IN DETAIL**
NOT TO SCALE
E11002

## FEEDER SCHEDULE
### COPPER ONLY

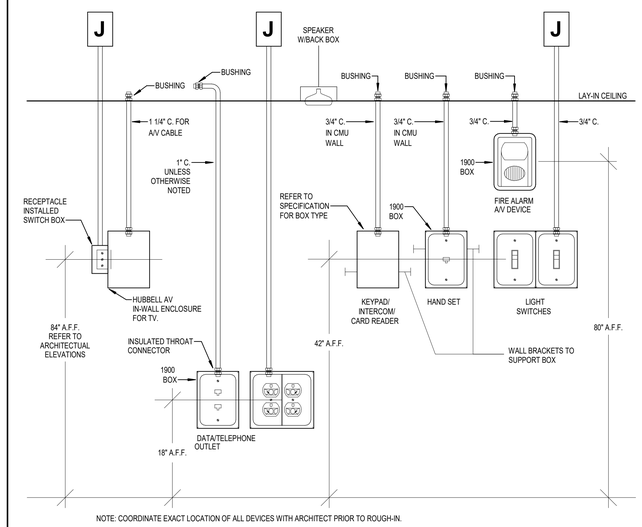
| RATING | SETS | CONDUCTOR SIZE | CONDUIT |
|---|---|---|---|
| 30A | 1 | 4#10, 1#10 G. | 3/4" |
| 40A | 1 | 4#8, 1#10 G. | 1" |
| 50A | 1 | 4#8, 1#10 G. | 1" |
| 60A | 1 | 4#6, 1#10 G. | 1" |
| 70A | 1 | 4#4, 1#8 G. | 1 1/4" |
| 80A | 1 | 4#4, 1#8 G. | 1 1/4" |
| 90A | 1 | 4#3, 1#8 G. | 1 1/4" |
| 100A | 1 | 4#3, 1#8 G. | 1 1/4" |
| 125A | 1 | 4#1, 1#6 G. | 1 1/2" |
| 150A | 1 | 4#1/0, 1#6 G. | 1 1/2" |
| 175A | 1 | 4#2/0, 1#6 G. | 2" |
| 200A | 1 | 4#3/0, 1#6 G. | 2" |
| 225A | 1 | 4#4/0, 1#4 G. | 2 1/2" |
| 250A | 1 | 4#250, 1#4 G. | 2 1/2" |
| 300A | 1 | 4#350, 1#4 G. | 3" |
| 350A | 1 | 4#500, 1#3 G. | 3 1/2" |
| 400A | 1 | 4#600, 1#3 G. | 4" |
| 450A | 2 | 4#4/0, 1#2 G. | 2 1/2" |
| 500A | 2 | 4#250, 1#2G. | 2 1/2" |
| 600A | 2 | 4#350, 1#1G. | 3" |
| 700A | 2 | 4#500, 1#1/0G. | 4" |
| 800A | 2 | 4#600, 1#1/0G. | 4" |
| 1000A | 3 | 4#500, 1#2/0G. | 4" |
| 1200A | 4 | 4#350, 1#3/0G. | 3" |
| 1600A | 4 | 4#600, 1#4/0G. | 4" |
| | 5 | 4#500, 1#4/0G. | 4" |
| 2000A | 5 | 4#600, 1#250 G. | 4" |
| | 6 | 4#500, 1#250 G. | 4" |
| 2500A | 6 | 4#600, 1#350 G. | 4" |
| | 7 | 4#500, 1#350 G. | 4" |
| 3000A | 8 | 4#500, 1#400 G. | 4" |
| 3500A | 9 | 4#600, 1#500 G. | 4" |
| | 10 | 4#500, 1#500 G. | 4" |
| 4000A | 10 | 4#600, 1#500 G. | 4" |
| | 11 | 4#500, 1#500 G. | 4" |
| 5000A | 12 | 4#600, 1#750 G. | 4" |
| | 14 | 4#500, 1#750 G. | 4" |

1. ELECTRICAL CONTRACTOR SHALL PROVIDE THE NUMBER OF LUGS AND PROPER LUG SIZES TO ACCEPT CONDUCTOR SIZES SHOWN.
2. GROUND NOT REQUIRED AT SERVICE LATERAL.

## 1-PHASE 3-WIRE FEEDER SCHEDULE
### COPPER ONLY

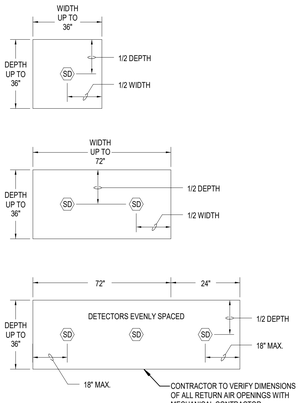
| RATING | SETS | CONDUCTOR SIZE | CONDUIT |
|---|---|---|---|
| 30A | 1 | 3#10, 1#10 G. | 3/4" |
| 40A | 1 | 3#8, 1#10 G. | 3/4" |
| 50A | 1 | 3#8, 1#10 G. | 3/4" |
| 60A | 1 | 3#6, 1#10 G. | 1" |
| 70A | 1 | 3#4, 1#8 G. | 1" |
| 80A | 1 | 3#4, 1#8 G. | 1" |
| 90A | 1 | 3#3, 1#8 G. | 1 1/4" |
| 100A | 1 | 3#3, 1#8 G. | 1 1/4" |
| 125A | 1 | 3#1, 1#6 G. | 1 1/4" |
| 150A | 1 | 3#1/0, 1#6 G. | 1 1/2" |
| 175A | 1 | 3#2/0, 1#6 G. | 1 1/2" |
| 200A | 1 | 3#3/0, 1#6 G. | 2" |
| 225A | 1 | 3#4/0, 1#4 G. | 2" |
| 250A | 1 | 3#250, 1#4 G. | 2 1/2" |
| 300A | 1 | 3#350, 1#4 G. | 2 1/2" |
| 350A | 1 | 3#500, 1#3 G. | 3" |
| 400A | 1 | 3#600, 1#3 G. | 3 1/2" |
| 450A | 2 | 3#4/0, 1#2 G. | 2" |
| 500A | 2 | 3#250, 1#2G. | 2 1/2" |
| 600A | 2 | 3#350, 1#1G. | 3" |
| 700A | 2 | 3#500, 1#1/0G. | 3 1/2" |
| 800A | 2 | 3#600, 1#1/0G. | 3 1/2" |
| 1000A | 3 | 3#500, 1#2/0G. | 3" |
| 1200A | 4 | 3#350, 1#3/0G. | 3" |
| 1600A | 4 | 3#600, 1#4/0G. | 3 1/2" |
| | 5 | 3#500, 1#4/0G. | 3" |
| 2000A | 5 | 3#600, 1#250G. | 3 1/2" |
| | 6 | 3#500, 1#250G. | 3" |
| 2500A | 6 | 3#600, 1#350G. | 3 1/2" |
| | 7 | 3#500, 1#350G. | 3 1/2" |
| 3000A | 8 | 3#500, 1#400G. | 3 1/2" |
| 3500A | 9 | 3#600, 1#500G. | 3 1/2" |
| | 10 | 3#500, 1#500G. | 3 1/2" |
| 4000A | 10 | 3#600, 1#500G. | 3 1/2" |
| | 11 | 3#500, 1#500G. | 3 1/2" |

1. ELECTRICAL CONTRACTOR SHALL PROVIDE THE NUMBER OF LUGS AND PROPER LUG SIZES TO ACCEPT CONDUCTOR SIZES SHOWN.
2. GROUND NOT REQUIRED AT SERVICE LATERAL.

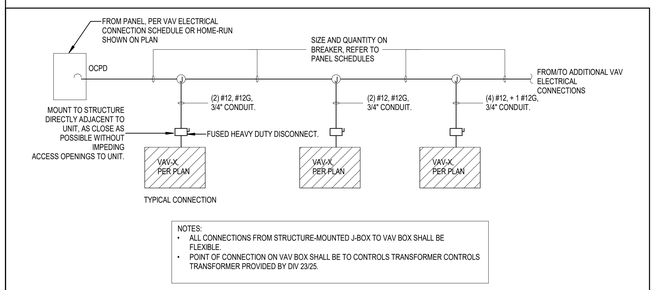



**11 TYPICAL DEVICE ELEVATIONS**
NOT TO SCALE
E11001

1. DUCT DETECTORS LISTED FOR THE VELOCITY PRESENT SHALL BE INSTALLED AT THE RETURN AIR OPENING WHERE THE RETURN AIR ENTERS THE COMMON RETURN AIR SYSTEM.
2. THE DETECTORS SHOULD BE INSTALLED UP TO 12" IN FRONT OF OR BEHIND THE OPENING AND SPACED ACCORDING TO THE FOLLOWING EQUIPMENT DIMENSIONS.
   a. WIDTH:
      - UP TO 36": ONE DETECTOR CENTERED IN THE OPENING.
      - UP TO 72": TWO DETECTORS LOCATED AT THE 1/4 POINTS OF THE OPENING
      - OVER 72": ONE ADDITIONAL DETECTOR FOR EACH FULL 24" OF ADDITIONAL OPENING WIDTH
   b. DEPTH: THE NUMBER AND SPACING OF DETECTORS IN THE VERTICAL DEPTH OF THE OPENING SHALL BE THE SAME AS THOSE GIVEN FOR THE HORIZONTAL WIDTH INDICATED ABOVE.
   c. ORIENTATION: DETECTORS SHALL BE ORIENTED IN THE MOST FAVORABLE POSITION FOR SMOKE ENTRY WITH RESPECT TO THE DIRECTION OF AIR FLOW.




**12 RETURN AIR OPENING SMOKE DETECTORS**
NOT TO SCALE
E12002




**13 TYPICAL VAV BOX ELECTRICAL CONNECTION DETAIL**
NOT TO SCALE
E13010


**CLIENT**
FORT BEND COUNTY
301 JACKSON ST.
RICHMOND, TX 77469
T 281-342-3411

**ARCHITECT**
PGAL
PGAL, Inc.
3131 Briarpark Dr.
Suite 200
Houston, TX 77042
T 713 622 1444
F 713 622 1444
www.pgal.com

**CONSULTANT**

**REGISTRATION**
ROMAN MATHUR 13116
10/17/2024


**DRAWING HISTORY**

| No. | DATE | DESCRIPTION |
|---|---|---|
| | 05/01/2024 | 100% DESIGN DEVELOPMENT |
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTUCTION DOCUMENTS |
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**PROJECT NAME**
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**
1007828.00

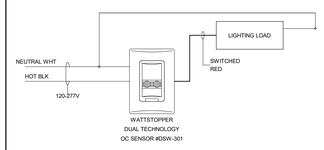
**SHEET TITLE**
ELECTRICAL DETAILS

**SHEET NUMBER**
E6.01


DBR
9990 Richmond Avenue
South Building, Suite 300
Houston, Texas 77042
713.914.0888 p 713.914.0886 f
TBPE Firm Registration No. 2234

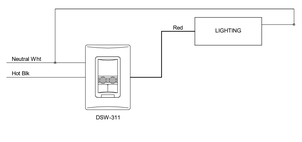

DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|



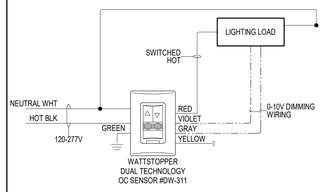

CONFIGURE SENSOR TO OCCUPANCY MODE (AUTO-ON/AUTO-OFF)

**1 LINE VOLTAGE WALL MOUNTED OCCUPANCY SENSOR**
NOT TO SCALE
EW25011



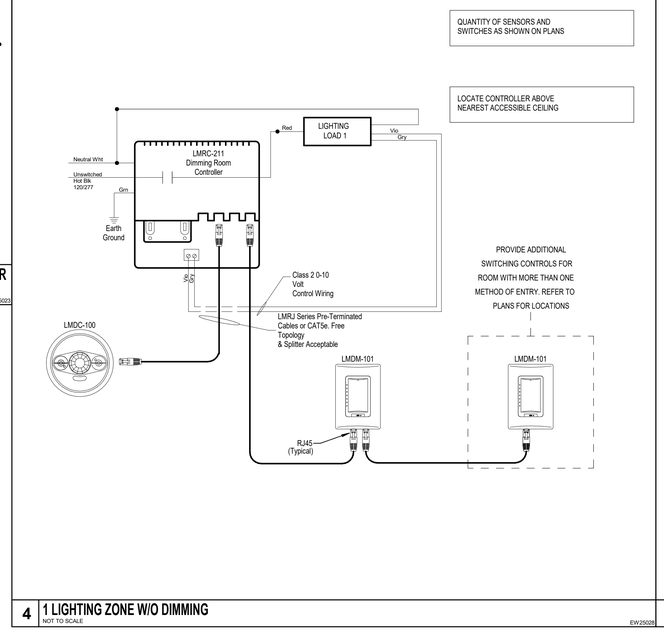

SENSOR SHALL BE SET TO OCCUPANCY MODE (AUTO ON/AUTO-OFF)

**2 WATTSTOPPER - LINE VOLTAGE DUAL TECHNOLOGY OC SENSOR DIMMING**
NOT TO SCALE
EW25012

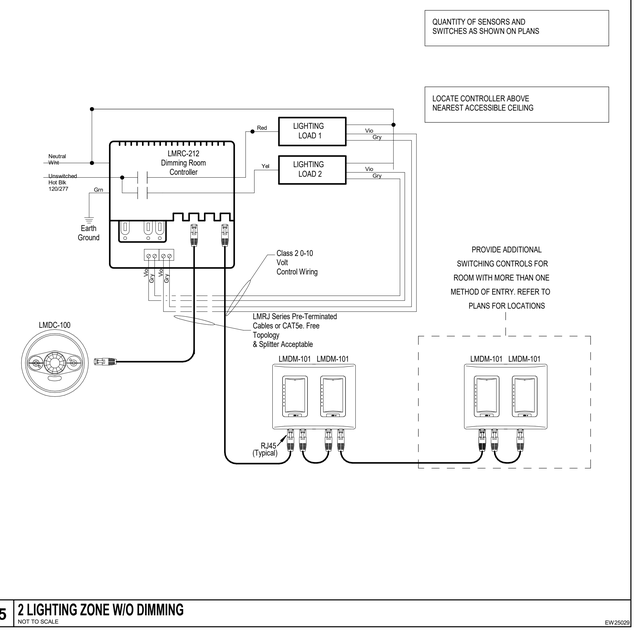



CONFIGURE SENSOR TO OCCUPANCY MODE (AUTO-ON/AUTO-OFF).
UN-USED WIRES SHALL BE CAPPED.
REQUIRES CLASS 1 WIRING FOR 0-10V DIMMING.

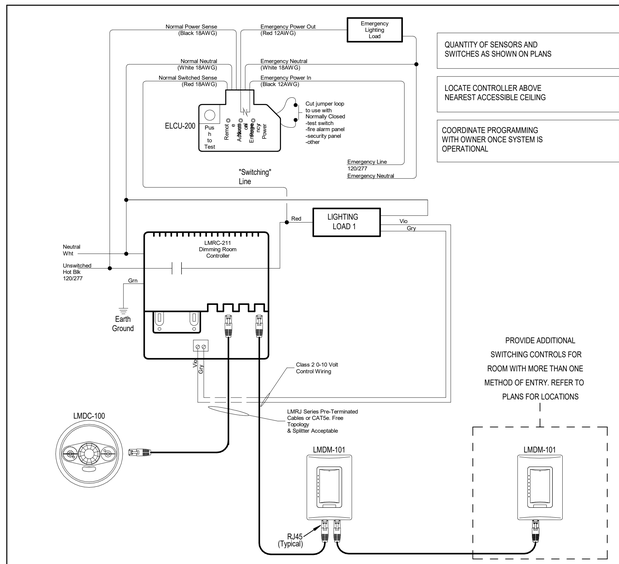
**3 LINE VOLTAGE WALL MOUNTED OCCUPANCY SENSOR W/DIMMING**
NOT TO SCALE
EW25023



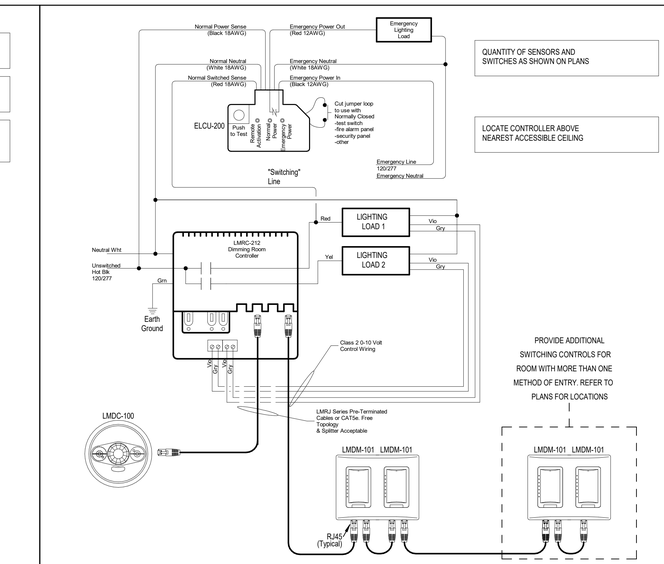

**4 1 LIGHTING ZONE W/O DIMMING**
NOT TO SCALE
EW25026



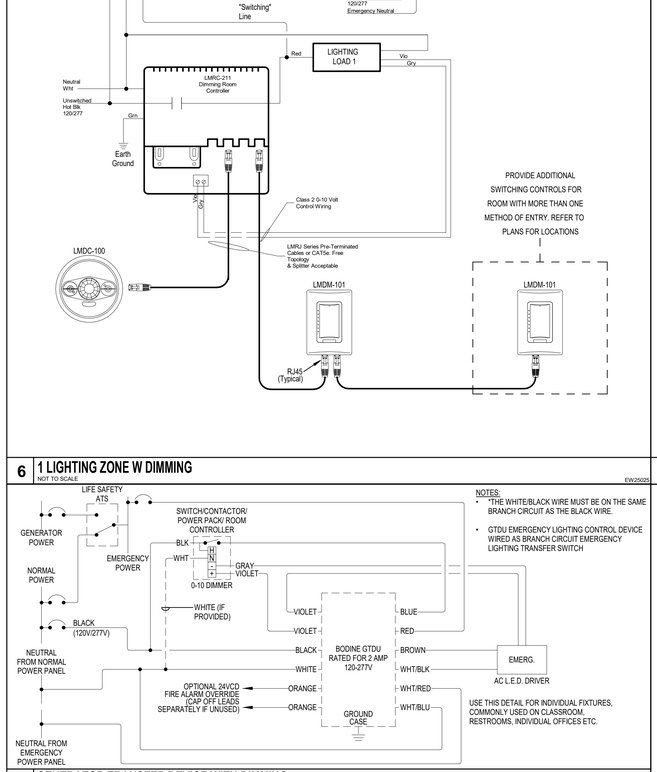

**5 2 LIGHTING ZONE W/O DIMMING**
NOT TO SCALE
EW25029



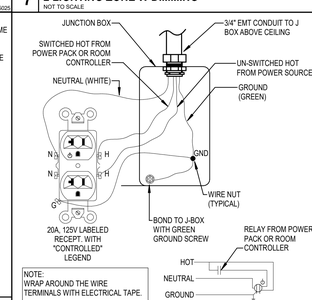

**6 1 LIGHTING ZONE W DIMMING**
NOT TO SCALE
EW25025



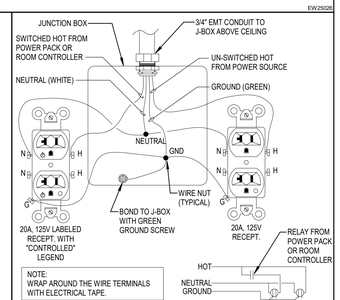

**7 2 LIGHTING ZONE W DIMMING**
NOT TO SCALE
EW25026



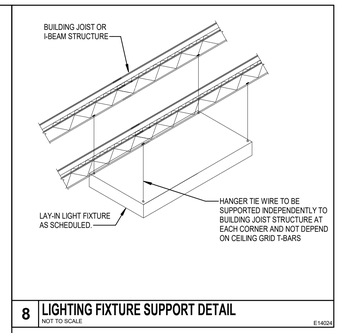

**9 GENERATOR TRANSFER DEVICE WITH DIMMING OVERRIDE, U.L. 1008.**
NOT TO SCALE
E14003




**10 SWITCHED RECEPTACLE DETAIL**
NOT TO SCALE
E13015




**11 CONTROLLED QUAD DETAIL**
NOT TO SCALE
E13028




**8 LIGHTING FIXTURE SUPPORT DETAIL**
NOT TO SCALE
E14024


**CLIENT**

THE STATE OF TEXAS
FORT BEND COUNTY

**FORT BEND COUNTY**

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**CONSULTANT**

**REGISTRATION**

STATE OF TEXAS
ROMAIN MATHUR
131169
LICENSED ARCHITECT

10/17/2024


**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 05/01/2024 | 100% DESIGN DEVELOPMENT |
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTUCTION DOCUMENTS |
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**PROJECT NAME**
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**
1007828.00

**SHEET TITLE**
ELECTRICAL DETAILS

**SHEET NUMBER**
E6.02

| EXISTING RELAY PANEL SCHEDULE - 1RPA | | | | |
|---|---|---|---|---|
| RELAY # | CIRCUIT # | CONTROL STATION INPUT | DESCRIPTION | NOTES |
| 1 | 1HA-1 | 1MA*, OR1 | SUPPORT CORRIDOR LIGHTS | 1,2 |
| 2 | 1HA-3 | 1MA2 | EAST COURTROOM | 1,2 |
| 3 | | | EXISTING SPARE | |
| 4 | 1HA-6 | 1MA*, 1MB*, 1MD*, OR1 | MAIN CORRIDOR LIGHTS | 1,2 |
| 5 | 1HA-8 | 1MA*, 1MB*, 1MD*, OR1 | MAIN CORRIDOR LIGHTS | 1,2 |
| 6 | 1HA-11 | PHOTOCELL | EXTERIOR LIGHTS | 3 |
| 7 | ***1HA-31*** | ***SLB7*** | ***COURT HOUSE*** | ***1,2*** |
| 8 | | | EXISTING SPARE | |

NOTES :
1.- RELAY TO BE SET FOR 6:00 AM "ON", 11:00 PM "OFF".
2.- PROGRAM OFF SWEEP WARNING TO BLINK LIGHTS 10 MINUTES PRIOR TO "OFF" SWEEP.
***BOLD ITALIC INDICATES NEW REQUIREMENT.***
***MAINTAIN ACTIVE CIRCUITS NOT INTENDED TO BE DEMOLISHED - FIELD CONFIRM.***

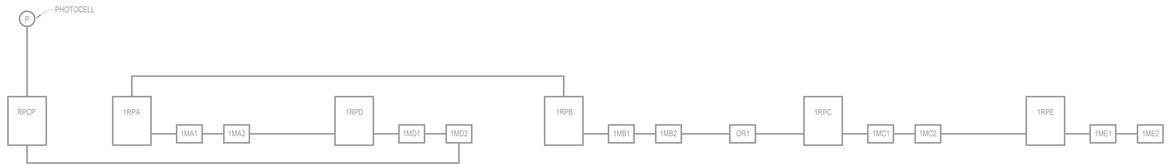
| EXISTING RELAY PANEL SCHEDULE - 1RPE | | | | |
|---|---|---|---|---|
| RELAY # | CIRCUIT # | CONTROL STATION INPUT | DESCRIPTION | NOTES |
| 1 | 1HE-6 | 1ME1, 1ME2, OR1 | CLERK AREA LIGHTS | 1,2 |
| 2 | 1HE-8 | 1ME1, 1ME2, OR1 | CLERK AREA LIGHTS | 1,2 |
| 3 | 1HE-10 | 1ME1, 1ME2, OR1 | CLERK AREA LIGHTS | 1,2 |
| 4 | 1HE-5 | 1ME1, 1ME2, OR1 | CLERK AREA LIGHTS | 1,2 |
| 5 | ***1HE-7*** | ***SLVB1b, SLVB2b, SLVB3b, SLVB4b*** | ***CORRIDOR*** | ***1,2*** |
| 6 | ***1EHA-9*** | ***SLVB1a, SLVB2a, SLVB3a, SLVB4a*** | ***CORRIDOR*** | ***1,2*** |
| 7 | ***1HE-21*** | ***SLVB5*** | ***COURT HOUSE*** | ***1,2*** |
| 8 | ***1HE-23*** | ***SLVB6*** | ***COURT HOUSE*** | ***1,2*** |

NOTES :
1.- RELAY TO BE SET FOR 6:00 AM "ON", 11:00 PM "OFF".
2.- PROGRAM OFF SWEEP WARNING TO BLINK LIGHTS 10 MINUTES PRIOR TO "OFF" SWEEP.
***BOLD ITALIC INDICATES NEW REQUIREMENT. MAINTAIN ACTIVE CIRCUITS NOT INTENDED TO BE DEMOLISHED - FIELD CONFIRM.***

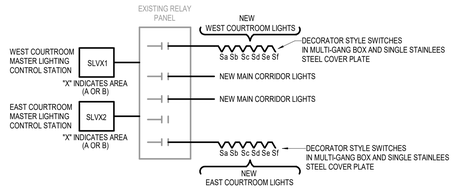
## LIGHTING CONTROLS DEVICE SCHEDULE

| TYPE | DESCRIPTION | COMMENTS |
|---|---|---|
| $S$ $S^{3}$ $S^{4}$ $S^{K}$ | LINE VOLTAGE SWITCH. | '3' INDICATES THREE WAY SWITCHING. '4' INDICATES FOUR WAY SWITCHING. 'K' INDICATES SWITCH SHALL BE KEYED SWITCH. |
| $S^{MC}$ | LINE VOLTAGE MOMENTARY CONTACT SWITCH. | |
| $S^{DR}$ | LINE VOLTAGE DIMMER SWITCH | DIMMER FOR USE IN DWELLING UNIT. COORDINATE DIMMING TYPE WITH FINAL FIXTURE AND LAMP SELECTION TO ENSURE COMPATIBILITY. |
| $S^{3,D}$ | LINE VOLTAGE DIMMER WITH 3-WAY SWITCH. | 3-WAY DIMMER FOR USE IN DWELLING UNIT. COORDINATE DIMMING TYPE WITH FINAL FIXTURE AND LAMP SELECTION TO ENSURE COMPATIBILITY. |
| $S^{F}$ | MULTI-SPEED FAN CONTROLLER WITH LINE VOLTAGE SWITCH. | |
| $S^{T}$ | LINE VOLTAGE TIMER SWITCH WITH DIGITAL TIMER. | RATED FOR 120/277VAC. PROVIDE WITH AUDIBLE & VISUAL ALERTS. USER PROGRAMMABLE FOR 5MIN-12HR TIME-OUT SETTINGS. |
| $S^{OC1}$ | LINE VOLTAGE WALL MOUNT DUAL TECHNOLOGY OCCUPANCY SENSOR | SENSOR SHALL BE SET TO OCCUPANCY MODE |
| $S^{OC2}$ | LINE VOLTAGE WALL MOUNT DUAL TECHNOLOGY OCCUPANCY SENSOR WITH DUAL RELAYS. | SENSOR SHALL BE SET TO OCCUPANCY MODE. ONE RELAY SHALL SERVE 120 VOLT LIGHTING IN AREA INDICATED, AND ONE RELAY SHALL SERVE 277 VOLT LIGHTING. |
| $S^{OCD}$ | LOW VOLTAGE OC SENSOR SWITCH WITH 0-10V DIMMER | SENSOR SHALL BE SET TO OCCUPANCY MODE |
| $S^{LV}$ $S^{LVK}$ | LOW VOLTAGE MANUAL CONTROL. | CONNECT TO RELAY PANEL OR TIME CLOCK FOR TIME OF DAY OVERRIDE AS NOTED ON PLANS. PROVIDE MULTI-BUTTON SWITCH AS NOTED ON PLANS. 'K' INDICATES SWITCH SHALL BE KEYED SWITCH. |
| $S^{D}$ | LOW VOLTAGE SWITCH WITH 0-10V DIMMER | PROVIDE MULTI-BUTTON SWITCH AS REQUIRED PER SWITCH LEGS SHOWN ON PLANS. PROVIDE POWER PACKS OR ROOM CONTROLLERS AS REQUIRED. |
| OC1 | CEILING MOUNTED DUAL TECH OCCUPANCY SENSOR. | SET TO OCCUPANCY MODE. PROVIDE POWER PACKS AS NEEDED. |
| OC2 | CEILING MOUNTED DUAL TECH OCCUPANCY SENSOR. | SET TO OCCUPANCY MODE. PROVIDE POWER PACKS AS REQUIRED. |
| OC3 | CEILING MOUNTED ULTRASONIC OR MICROPHONIC OCCUPANCY SENSOR. | SET TO OCCUPANCY MODE. PROVIDE POWER PACKS AS REQUIRED. |
| OC4 | CORNER MOUNTED DUAL TECH OCCUPANCY SENSOR. | SET TO VACANCY MODE. PROVIDE POWER PACKS AS REQUIRED. |
| OC5 | WET LOCATION PIR OCCUPANCY SENSOR. | CONNECT GARAGE OCCUPANCY SENSORS TO RELAY PANEL SERVING AREA. PROVIDE POWER PACKS FOR CONTROL WHERE NOT LOCATED IN THE GARAGE. |
| OC6 | CEILING MOUNTED DUAL TECH OCCUPANCY SENSOR FOR HIGH BAY APPLICATION. | SET TO VACANCY MODE. PROVIDE POWER PACKS AS REQUIRED. |
| PC | DIGITAL PHOTOSENSOR | CONNECT TO ROOM CONTROLLER OR RELAY PANEL AS NOTED ON PLANS. |
| DS | DAYLIGHT HARVESTING SENSOR | CONNECT TO ROOM CONTROLLER OR INDIVIDUAL LIGHT FIXTURE FOR DAYLIGHT HARVESTING DIMMING CONTROL. |

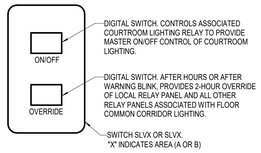
NOTES:
1. WATTSTOPPER IS THE BASIS OF DESIGN.
2. THE LIGHTING CONTROLS SCHEDULED ARE THE BASIS OF DESIGN. IT IS NOT INTENDED TO LIMIT COMPETITION FROM EQUAL MANUFACTURERS. ALL BIDDERS SHALL SUBMIT THEIR PROPOSED LIGHTING CONTROLS IN SUBMITTAL FORM A MINIMUM OF 10 BUSINESS DAYS PRIOR TO BID DATE FOR REVIEW. APPROVED LIGHTING CONTROL SYSTEMS WILL BE ISSUED IN AN ADDENDUM.
3. BASIS OF DESIGN SHALL BE A HARD-WIRED TYPE SYSTEM, UNLESS NOTED OTHERWISE.



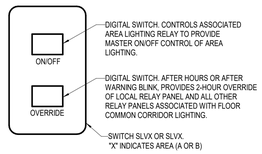

## 1 E6.03 EXISTING RELAY PANEL RISER DIAGRAM
1" = 1'-0"




## 2 E6.03 TYPICAL COURTROOM LIGHTING CONTROL DIAGRAM
1" = 1'-0"




## 3 E6.03 TYPICAL COURTROOM MASTER LIGHTING CONTROL STATION
1" = 1'-0"




## 4 E6.03 TYPICAL NON-COURTROOM MASTER LIGHTING CONTROL STATION
1" = 1'-0"

| STANDARD SEQUENCE OF OPERATIONS | AUTO ON1 | MANUAL ON (VACANCY) | AUTO OFF (20MIN MAX) | PARTIAL OFF AT NORMAL HOURS2 | AUTO OFF AFTER HOURS (30MIN MAX) | TIME ON | TIME OFF | ASTRONOMIC or PHOTOCELL ON/OFF | AUTO STEP CONTROL WITH OFF4 | AUTO CONTINUOUS DIM WITH OFF4, 5 | MANUAL BI-LEVEL REDUCTION CONTROL6 | MANUAL CONTINUOUS DIM CONTROL | MANUAL ON/OFF SWITCH | MANUAL DIMMER SWITCH | DISPLAY, ACCENT, TASK CONTROL7 | AUTOMATIC RECEPTACLE CONTROL | v1 - 05192022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ROOM TYPE | OCCUPANCY SENSOR | | | | | TIME SWITCH | | | DAYLIGHT CTL | | LT REDUCT | | MANUAL CONTROL | | | | SEQUENCE OF OPERATION |
| Spaces (≤ 300 sq ft) | 50% | | 20 min | | | | | | | D | I | D | I | D | | | Auto On 50%; Occupancy sensor Auto Off; Manual control and ≥50% light reduction with two on/off controls: Where >150W in daylight area, use continuous dimming daylighting control and dimmer switch. |
| Enclosed Offices | | | 20 min | | | | | | | D | I | D | I | D | | I | Manual control and ≥50% light reduction with two on/off controls Where >150W in daylight area, use continuous dimming daylighting control and dimmer switch. 50% of receptacles turn on when occupied, off within 20 minutes of occupants leaving the space. |
| Open Plan Office Areas ≤600SqFt zones | 100% | | 20 min | | | | | | | D | | D | I | D | I | I | Auto On 100% when zone occupied; Occupancy sensor Auto Off; Manaul control. Where >150W in daylight area, use continuous dimming daylighting control and dimmer switch. 50% of receptacles turn on when occupied, off within 20 minutes of occupants leaving the space. |
| Class/Lecture/Training Room | 50% | | 20 min | | | | | | | D | I | D | I | D | I | I | Auto On 50%; Occupancy sensor Auto Off; Manual control and ≥50% light reduction with two on/off controls Where >150W in daylight area, use continuous dimming daylighting control and dimmer switch. 50% of receptacles turn on when occupied, off within 20 minutes of occupants leaving the space. |
| Conference/Meeting Room | 50% | | 20 min | | | | | | | D | I | D | I | D | I | I | Auto On 50%; Occupancy sensor Auto Off; Manual control and ≥50% light reduction with two on/off controls; Where >150W in daylight area, use continuous dimming daylighting control and dimmer switch. 50% of receptacles turn on when occupied, off within 20 minutes of occupants leaving the space. |
| Copy/Print Room | 50% | | 20 min | | | | | | | D | I | D | I | D | | I | Auto On 50%; Occupancy sensor Auto Off; Manual control and ≥50% light reduction with two on/off controls; Where >150W in daylight area, use continuous dimming daylighting control and dimmer switch. 50% of receptacles turn on when occupied, off within 20 minutes of occupants leaving the space. |
| Electrical/Mech/Equip Room | | I | 20 min | | | | | | | | | | I | | | | Manual On; Occupancy sensor Auto Off; Manual control device. |
| Janitor Closet | | I | 20 min | | | | | | | | | | I | | | | Manual On; Occupancy sensor Auto Off; Manual control device. |
| Restroom | 100% | | 20 min | | | | | | | | | | I | | | | Auto On 100%. Occupancy sensor Auto Off; Manual control. |
| Lunch/Break Rooms/Lounges | 50% | | 20 min | | | | | | | D | I | D | I | D | I | I | Auto On 50%; Occupancy sensor Auto Off; Manual control and ≥50% light reduction with two on/off controls; Where >150W in daylight area, use continuous dimming daylighting control and dimmer switch. 50% of receptacles turn on when occupied, off within 20 minutes of occupants leaving the space. |
| Public Lobbies | 100% | | 20 min | | | | | | | D | | D | I | D | I | | Auto On 100%. Occupancy sensor Auto Off; Manual control device; Where >150W in daylight area, use continuous dimming daylighting control and dimmer switch. |
| Corridor | 100% | | 20 min | | | | | | | D | | D | I | D | I | | Time On 50%; Occupancy sensor Partial Off ≥50%; Local control device; After hour occupancy sensor Auto On/Off; Where >150W in daylight area, continuous dimming daylighting control. |
| Stairwell | 100% | | 20 min | | | | | | | D | | D | I | D | | | Auto On 100%; Occupancy sensor Auto Off; Manual control; Where >150W in daylight area, use continuous dimming daylighting control and dimmer switch. |
| Storage Room | 50% | | 20 min | | | | | | | D | I | D | I | D | | | Auto On 50%; Occupancy sensor Auto Off; Manual control and ≥50% light reduction with two on/off controls; Where >150W in daylight area, use continuous dimming daylighting control and dimmer switch. |
| Library Stacks | | I | | | | | close | | | D | I | D | I | D | | | Manual On; Time Off with closing hours. After hours 2 hour override from manual control device; Where >150W in daylight area, continuous dimming daylighting control with dimmer switch. |
| Multipurpose Rooms | 50% | | 20 min | | | | | | | D | I | D | I | D | | | Auto On 50%; Occupancy sensor Auto Off; Manual control and ≥50% light reduction with two on/off controls; Where >150W in daylight area, use continuous dimming daylighting control and dimmer switch. |
| Locker Room | 50% | | 20 min | | | | | | | D | I | D | I | D | | | Auto On 50%; Occupancy sensor Auto Off; Manual control and ≥50% light reduction with two on/off controls; Where >150W in daylight area, use continuous dimming daylighting control and dimmer switch. |

I= Designation for code compliant default control design for spaces without daylighting control
D = Where daylighting control is required, "D" designation indicates controls required in the space for code compliance design
CK = Captive Key Switch system for use in Hotel/Motel and Guest Suites

**NOTES:** 1 May be Manual On or Auto On to ≤50%. Full Auto On only permitted in Corridors, Interior Parking, Stairways, Lobbies, Restrooms, Open Office, Library Stacks, Locker Rooms.
2 Partial Auto Off must reduce lighting by ≥50% during normal operating hours in corridors, warehouse aisles and open areas. Each aisle must be independently controlled. Full Auto Off complies with Partial Auto Off.
3 Exterior / Parking / Site lighting must Auto Off during daylight hours, reduce by at least 50% between midnight and 6AM or from one hour after business closing until 6AM before business opening.
4Automatic daylight control required where >150W lighting power in toplight or sidelight daylight area. Continuous dimming with Off. Assumes 0-10V dimmable fixtures in daylight and non-daylight area unless otherwise specified.
5Code requires automatic continuous dimming with full Off capability in daylighting areas of all space types.
6Manual bilevel lighting reduction control must allow ≥50% of the general lighting to be manually turned off by a control device located in the space.
7Display, Accent and Task lighting must have manual control independent from general lighting. Auto Off with occupancy sensors or time switch control required. Exempt from automatic daylighting control.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| | 05/01/2024 | 100% DESIGN DEVELOPMENT |
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**PROJECT NAME**
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

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RICHMOND, TX 77469

**PROJECT NUMBER**
1007828.00

**SHEET TITLE**
ELECTRICAL DETAILS

**SHEET NUMBER**
E6.03

(NOT ALL ITEMS INDICATED APPLY TO THIS PROJECT)

# ABBREVIATIONS

## A

| | |
|---|---|
| A | AIR (COMPRESSED) |
| AFF | ABOVE FINISHED FLOOR |
| AFG | ABOVE FINISHED GRADE |
| AHU | AIR HANDLING UNIT |
| AL | ALUMINUM |
| AP | ACCESS PANEL |
| ARCH | ARCHITECT, ARCHITECTURAL |
| AS | AIR SEPARATOR |
| ASME | AMERICAN SOCIETY OF MECHANICAL ENGINEERS |
| ASTM | AMERICAN SOCIETY OF TESTING AND MATERIALS |
| AV | ACID VENT |
| AW | ACID WASTE |
| AUX | AUXILIARY |

## B

| | |
|---|---|
| B | BOILER |
| BFF | BELOW FINISH FLOOR |
| BFV | BUTTERFLY VALVE |
| BM | BENCHMARK |
| BOF | BOTTOM OF FOOTING |
| BOS | BOTTOM OF STRUCTURE |
| BT | BATH TUB |
| BTU | BRITISH THERMAL UNIT |
| BV | BALL VALVE |
| BWV | BACK WATER VALVE |

## C

| | |
|---|---|
| C | CELSIUS |
| CAB | CABINET |
| CB | CATCH BASIN |
| CD | CONDENSATE DRAIN LINE |
| CFM | CUBIC FEET PER MINUTE |
| CFS | CUBIC FEET PER SECOND |
| CH | CHILLER |
| CP | CIRCULATING PUMP |
| CI | CAST IRON |
| CIRC | CIRCULATING |
| CL | CENTERLINE |
| CMU | CONCRETE MASONRY UNIT |
| CPI | CAST IRON PIPE INSTITUTE |
| CPVC | CHLORINATED POLYVINYL CHLORIDE |
| CO | CLEAN OUT |
| COL | COLUMN |
| CONC | CONCRETE, CONCENTRIC |
| CONN | CONNECTION |
| CRAC | COMPUTER ROOM A/C UNIT |
| CW | COLD WATER |

## D

| | |
|---|---|
| DF | DRINKING FOUNTAIN |
| DIA | DIAMETER |
| DIM | DIMENSION |
| DISC | DISCONNECT |
| DN | DOWN |
| DS | DOWNSPOUT |
| DW | DISHWASHER |
| DWG | DRAWING |
| DWH | DOMESTIC WATER HEATER |
| DBP | DOMESTIC BOOSTER PUMP |

## E

| | |
|---|---|
| ECC | ECCENTRIC |
| EDF | ELECTRIC DRINKING FOUNTAIN |
| ET | EXPANSION TANK |
| ETR | EXISTING TO REMAIN |

## F

| | |
|---|---|
| F | FARENHEIT, FIRE |
| FBO | FURNISHED BY OTHERS |
| FCO | FLOOR CLEAN OUT |
| FCS | FLOOR CONTROL STATON |
| FD | FLOOR DRAIN, FIRE DAMPER |
| FDC | FIRE DEPARTMENT CONNECTION |
| FH | FIRE HYDRANT |
| FHC | FIRE HOSE CABINET |
| FHR | FIRE HOSE RACK |
| FHV | FIRE HOSE VALVE |
| FXT | FIXTURE |
| FLEX | FLEXIBLE |
| FL | FLOW LINES |
| FLR | FLOOR |
| FP | FIRE PUMP |
| FS | FLOW SWITCH, FIRE SPRINKLER |
| FS | FLOOR SINK |
| FT | FOOT, FEET |
| FW | FORCE WASTE |

## G

| | |
|---|---|
| G | GAS |
| GA | GAUGE |
| GAL | GALLON |
| GALV | GALVANIZED |
| GC | GENERAL CONTRACTOR |
| GCO | GRADE CLEANOUT |
| GLV | GLOBE VALVE |
| GPD | GALLONS PER DAY |
| GPH | GALLONS PER HOUR |
| GPM | GALLONS PER MINUTE |
| GV | GATE VALVE |

## H

| | |
|---|---|
| HB | HOSE BIBB |
| HD | HEAD, HUB DRAIN |
| HP | HORSEPOWER |
| HKP | HOUSEKEEPING PAD |
| HSC | HORIZONTAL SPLIT CASE |
| HT | HEIGHT |
| HTR | HEATER |
| HW | HOT WATER |
| HWR | HOT WATER RETURN |
| HWS | HOT WATER SUPPLY |
| HZ | HERTZ |

## I

| | |
|---|---|
| ID | INSIDE DIAMETER |
| IE | INVERT ELEVATION |
| IN | INCH |
| INSUL | INSULATION |
| IW | INDIRECT WASTE |

## J

| | |
|---|---|
| JP | JOCKEY PUMP |

## K

| | |
|---|---|
| KEC | KITCHEN EQUIPTMENT CONTRACTOR |
| KVA | KILOVOLT- AMPS |
| KW | KILOWATT |

## L

| | |
|---|---|
| L | LENGTH, LAVATORY |
| LAV | LAVATORY |
| LF | LINEAR FEET |
| LT | LINT |
| LP | LOW PRESSURE |
| LRA | LOCKED ROTOR AMPS |
| LVL | LEVEL |

## M

| | |
|---|---|
| MAX | MAXIMUM |
| MBTUH | THOUSAND OF BTU'S |
| MECH | MECHANICAL |
| MFR | MANUFACTURER |
| MH | MANHOLE |
| MI | MALLEABLE IRON |
| MS | MOP SINK |
| MTD | MOUNTED |
| MUW | MAKE-UP WATER |

## N

| | |
|---|---|
| N.C. | NORMALLY CLOSED |
| NFPA | NATIONAL FIRE PROTECTION ASSOCIATION |
| NIC | NOT IN CONTRACT |
| N.O. | NORMALLY OPEN |
| NTS | NOT TO SCALE |

## O

| | |
|---|---|
| OC | ON CENTER |
| OD | OUTSIDE DIAMETER, OVERFLOW DRAIN |
| OS&Y | OPEN STEM AND YOLK |
| O | MEDICAL OXYGEN |

## P

| | |
|---|---|
| PC | PLUMBING CONTRACTOR |
| PH | PHASE |
| PIV | POST INDICATOR VALVE |
| PNEU | PNEUMATIC |
| PNL | PANEL |
| PP | POLYPROPYLENE |
| PPM | PART PER MILLION |
| PRS | PRESSURE REDUCING STATION |
| PRV | PRESSURE REDUCING VALVE |
| PSF | POUNDS PER SQUARE FOOT |
| PSI | POUNDS PER SQUARE INCH |
| PSIG | POUNDS PER SQUARE INCH GAUGE |
| PVC | POLYVINYL CHLORIDE |

## Q

| | |
|---|---|
| QTY | QUANTITY |

## R

| | |
|---|---|
| RCP | REFLECTED CEILING PLAN, REINFORCED CONCRETE PIPE |
| RD | ROOF DRAIN |
| RE | REFERENCE,REFER |
| RECIRC | RECIRCULATE |
| REFR | REFRIGERATOR |
| REINF | REINGFORCING |
| RM | ROOM |
| RPM | REVOLUTIONS PER MINUTE ROOF TOP UNIT |
| RTU | ROOFTOP UNIT |
| RV | RELIEF VALVE |

## S

| | |
|---|---|
| SD | STORM DRAIN |
| SEC | SECONDARY |
| SECT | SECTION |
| SF | SQUARE FEET |
| SH | SHOWER |
| SIM | SIMILAR |
| SK | SINK |
| SP | SUMP PUMP, STATIC PRESSURE |
| SPEC | SPECIFICATION |
| SPR | SPRINKLER |
| SQ | SQUARE |
| SS | SERVICE SINK |
| SSD | SUBSURFACE DRAIN |
| STD | STANDARD |
| STL | STEEL |
| STR | STRAINER |
| SV | SANITARY VENT |
| SW | SOFT WATER |
| SOV | SHUT-OFF VALVE |

## T

| | |
|---|---|
| TD | TRENCH DRAIN |
| TDH | TOTAL DYNAMIC HEAD |
| TDL | TOTAL DEVELOPED LENGTH |
| TP | TRAP PRIMER |
| TPD | TRAP PRIMER DEVICE |
| TYP | TYPICAL |

## U

| | |
|---|---|
| U | URINAL |
| UCD | |
| UG | UNDERGROUND |
| UH | UNIT HEATER |
| UL | UNDERWRITERS LABORATORIES, INC. |
| UNO | UNLESS NOTED OTHERWISE |
| UF | UNDERFLOOR |
| US | UNDERSLAB |

## V

| | |
|---|---|
| V | VOLT, VENT |
| VAC | VACUUM(MEDICAL) |
| VB | VALVE BOX, VACUUM BREAKER |
| VCP | VITRIFIED CLAY PIPE |
| VEL | VELOCITY |
| VP | VACUUM PUMP |
| VTR | VENT THRU ROOF |

## W

| | |
|---|---|
| W | WATT, WASTE, WIDTH, WASHER |
| W/ | WITH |
| W/O | WITHOUT |
| WC | WATER CLOSET |
| WCO | WALL CLEANOUT |
| WH | WALL HYDRANT |
| WM | WATER METER |
| WP | WEATHERPROOF |
| WPD | WATER PRESSURE DROP |
| WWF | WELDED WIRE FABRIC |
| WT | WATERTIGHT, WEIGHT |

## Y

| | |
|---|---|
| Y | YARD HYDRANT |

## Z

| | |
|---|---|
| Z | ZONE |

# SYMBOLS

## PLUMBING SYSTEMS

- SANITARY DRAIN BELOW FLOOR
- EXISTING SOIL OR WASTE PIPING B.G.
- SANITARY DRAIN ABOVE FLOOR
- EXISTING SOIL OR WASTE PIPING A.G.
- PIPE DEMO
- SANITARY VENT
- EXISTING VENT PIPING
- GW — GREASE WASTE(ABOVE CEILING)
- GW — GREASE WASTE(BELOW FLOOR)
- SD — STORM DRAIN(ABOVE CEILING)
- SD — STORM DRAIN(BELOW FLOOR)
- OD — OVERFLOW DRAIN(ABOVE CEILING)
- OD — OVERFLOW DRAIN(BELOW FLOOR)
- AW — ACID WASTE(ABOVE CEILING)
- AW — EXISTING ACID WASTE PIPING A.G.
- AW — ACID WASTE(BELOW FLOOR)
- AW — EXISTING ACID WASTE PIPING B.G.
- AV — ACID VENT(ABOVE CEILING OR BELOW FLOOR)
- AV — EXISTING ACID VENT PIPING AV
- COLD WATER CW
- EXISTING DOMESTIC COLD WATER
- HOT WATER HW
- EXISTING DOMESTIC HOT WATER
- HOT WATER RECIRCULATION
- EXISTING DOMESTIC HOT WATER RETURN HWR
- G — NATURAL GAS
- T — TEMPERED WATER
- CA — COMPRESSED AIR
- A — MEDICAL AIR
- O — MEDICAL OXYGEN
- V — MEDICAL VACUUM
- F — FIRE STANDPIPE, FIRE LINE
- FS — WET AUTOMATIC FIRE SPRINKLER
- FW — FORCE WASTE
- TP — TRAP PRIMER
- D — DRAIN LINE
- SW — SOFT WATER
- LT — LINT WASTE

## PIPING FITTINGS

- CAP ON END OF PIPE
- ELBOW UP
- ELBOW DOWN
- VALVE IN DROP
- VALVE IN RISE
- DIRECTION OF FLOW
- DIRECTION OF SLOPE DOWN
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- TEE OUTLET UP
- TEE OUTLET DOWN
- UNION
- FLANGE
- STRAINER WITH BLOWDOWN VALVE
- GATE VALVE, HVAC BALANCING/STOP VALVE
- GLOBE VALVE
- BALL VALVE
- BALANCING VALVE WITH DIFFERENTIAL PRESSURE TAPS
- OS&Y VALVE
- CHECK VALVE
- BUTTERFLY VALVE
- TWO-WAY MODULATING CONTROL VALVE
- THREE-WAY MODULATING CONTROL VALVE
- SOLENOID VALVE
- PRESSURE REDUCING VALVE
- GAS REGULATOR
- GAS COCK
- SPRINKLER FLOOR CONTROL STATION
- MANUAL AIR VENT
- AUTOMATIC AIR VENT
- T&P RELIEF VALVE
- LINE CLEANOUT/ WALL CLEANOUT
- FLOOR CLEANOUT
- GRADE CLEANOUT
- PRESSURE GAUGE WITH GAUGE COCK
- THERMOMETER
- FLOW VENTURI
- VACUUM BREAKER
- VACUUM RELIEF VALVE
- BACKFLOW PREVENTOR
- CIRCULATING PUMP
- M — WATER SUB-METER

## MISCELLANEOUS

- DRAIN(TYPE AND SIZE AS NOTED ON PLANS)
- ROOF DRAIN OR OVERFLOW DRAIN
- ROOF DRAIN OR OVERFLOW DRAIN(FROM ABOVE)
- HOSE BIBB
- WALL HYDRANT
- PLUMBING FIXTURES
- EXISTING PLUMBING FIXTURES
- POINT OF NEW CONNECTION TO EXISTING PIPING
- PX.X — PLUMBING DRAWING NOTE REFERENCE
- 2 / P2.1 — DETAIL NUMBER OR PLAN / SHEET WHERE DETAIL OR PLAN IS SHOWN
- FS — FLOW SWITCH
- TS — TAMPER SWITCH
- ACCESS PANEL (AP)
- FIRE DEPARTMENT SIAMESE CONNECTION(WALL MOUNTED)
- FIRE DEPARTMENT SIAMESE CONNECTION(FREE STANDING)
- 2 / P7.1 — PLUMBING RISER DIAGRAM NUMBER / SHEET WHERE PLUMBING RISER DIAGRAM IS SHOWN

# GENERAL PLUMBING NOTES

1. UNLESS NOTED OTHERWISE, GRAVITY DRAINAGE PIPING 3" AND SMALLER SHALL BE PROVIDED AT NO LESS THAN 1/4" PER FOOT UNIFORM SLOPE AND GRAVITY DRAINAGE PIPING 4" AND LARGER SHALL BE PROVIDED AT NO LESS 1/8" PER FOOT UNIFORM SLOPE.
2. WHERE THE PREVAILING CODE ALLOWS FOR A SHALLOWER SLOPE FOR GRAVITY DRAINAGE PIPING THAN INDICATED ABOVE, THIS SHALL BE ALLOWED IF REQUIRED PER PROJECT CONDITIONS.
3. WHERE THE PREVAILING CODE REQUIRES A STEEPER SLOPE FOR GRAVITY DRAINAGE PIPING THAN INDICATED ABOVE (SUCH AS FOR GREASE WASTE PIPING) THEN SUCH REQUIREMENT(S) SHALL CONTROL.
4. UNLESS NOTED OTHERWISE, GRAVITY STORM DRAINAGE AND SECONDARY (OVERFLOW) PIPING SHALL BE PROVIDED AT NO LESS THAN 1/8" PER FOOT UNIFORM SLOPE.
5. FUEL GAS PIPING SHALL BE PROVIDED IN ACCORDANCE WITH THE PREVAILING GAS CODE OR NFPA 54, WHICHEVER REQUIREMENTS ARE MORE STRINGENT.
6. THE INSTALLATION OF THE BUILDING PLUMBING SYSTEMS SHALL BE COORDINATED ACCORDINGLY WITH THE WORK OF ALL OTHER TRADES.

# GENERAL FIRE PROTECTION NOTE

AN APPROPRIATELY STATE REGISTERED FIRE PROTECTION COMPANY SHALL PROVIDE A FULLY COMPLIANT AND FUNCTIONAL AUTOMATIC FIRE SPRINKLER SYSTEM TO PROTECT THE BUILDING IN ACCORDANCE WITH NFPA 13, THE PROJECT SPECIFICATIONS, AND THE REQUIREMENTS OF THE OWNER AND THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ). THE MOST STRINGENT REQUIREMENTS SHALL GOVERN.

# PLUMBING CODES

| | |
|---|---|
| 2021 | UPC |
| 2024 | IPC |
| 2024 | IFC |
| 2021 | IFGC |
| 2021 | IECC |


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TBPE Firm Registration No. 2234


**REGISTRATION**

STATE OF TEXAS — MIKE L. ASHCRAFT — 56590 — LICENSED PROFESSIONAL ENGINEER

10/17/2024

**DRAWING HISTORY**

| No. | DATE | DESCRIPTION |
|---|---|---|
| | 05/01/2024 | 100% DESIGN DEVELOPMENT |
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTUCTION DOCUMENTS |
| | 09/20/2024 | 100% CONSTRUCTION DOCUMENTS |
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

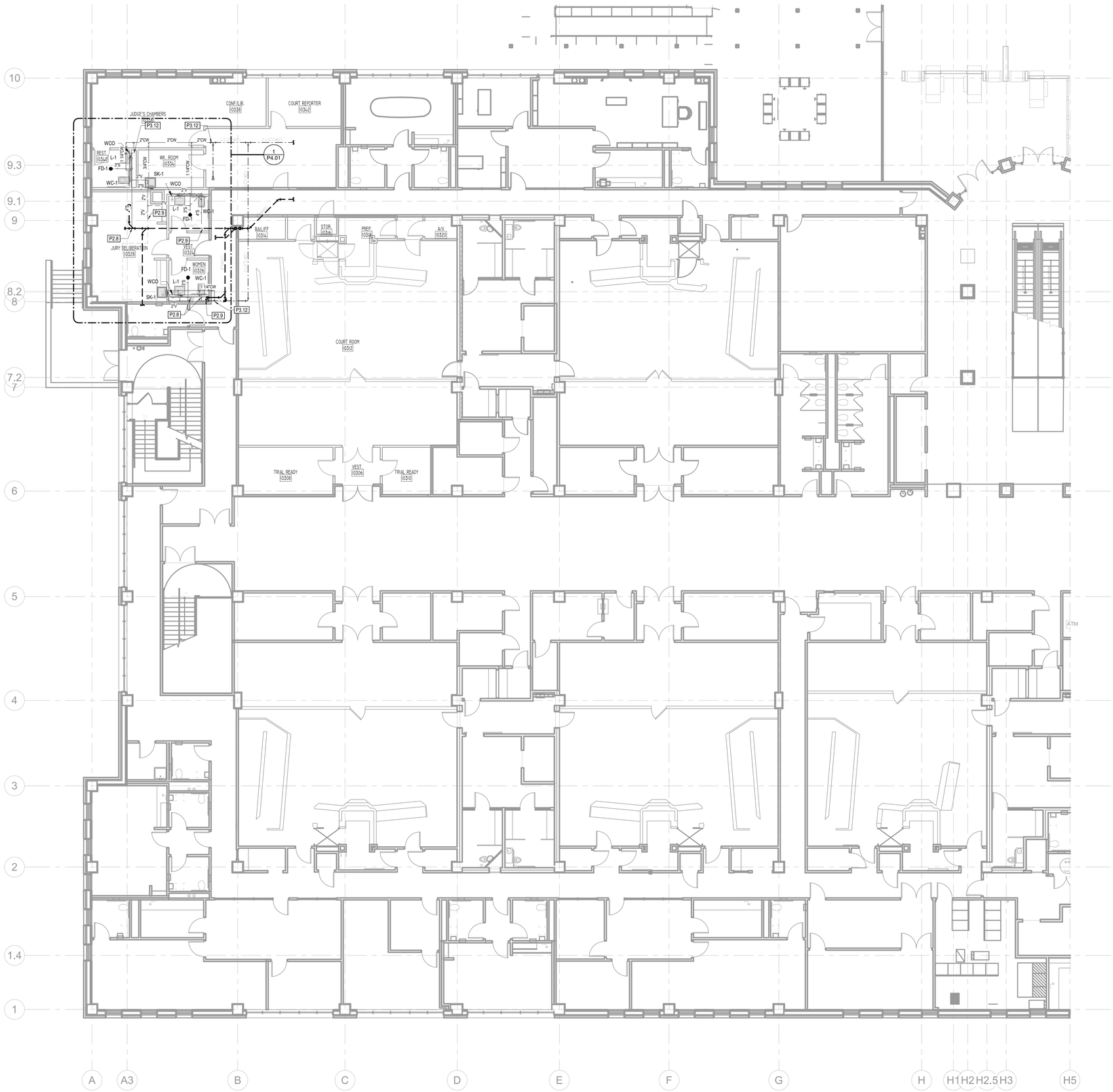
1007828.00

**SHEET TITLE**

PLUMBING SYMBOL LEGEND

**SHEET NUMBER**

P0.01




A P2.11 **LEVEL 1 PARTIAL PLUMBING PLAN A**
1/8" = 1'-0"

## PLUMBING KEYED NOTES

P2.8 CONNECT NEW SANITARY WASTE LINE TO EXISTING SANITARY WASTE LINE AT APPROXIMATE LOCATION TO SANITARY VERTICAL. SIZE AS NOTED ON THE PLAN. CONTRACTOR TO VERIFY EXACT SIZE AND LOCATION OF EXISTING SANITARY WASTE LINE IN THE FIELD

P2.9 CONNECT NEW SANITARY VENT TO EXISTING SANITARY VENT. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION AND COORDINATE ROUTING WITH ALL TRADES TO AVOID INTERFERENCE

P3.12 CONNECT NEW COLD WATER TO EXISTING COLD WATER. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION AND COORDINATE ROUTING WITH ALL TRADES TO AVOID INTERFERENCE

TN PN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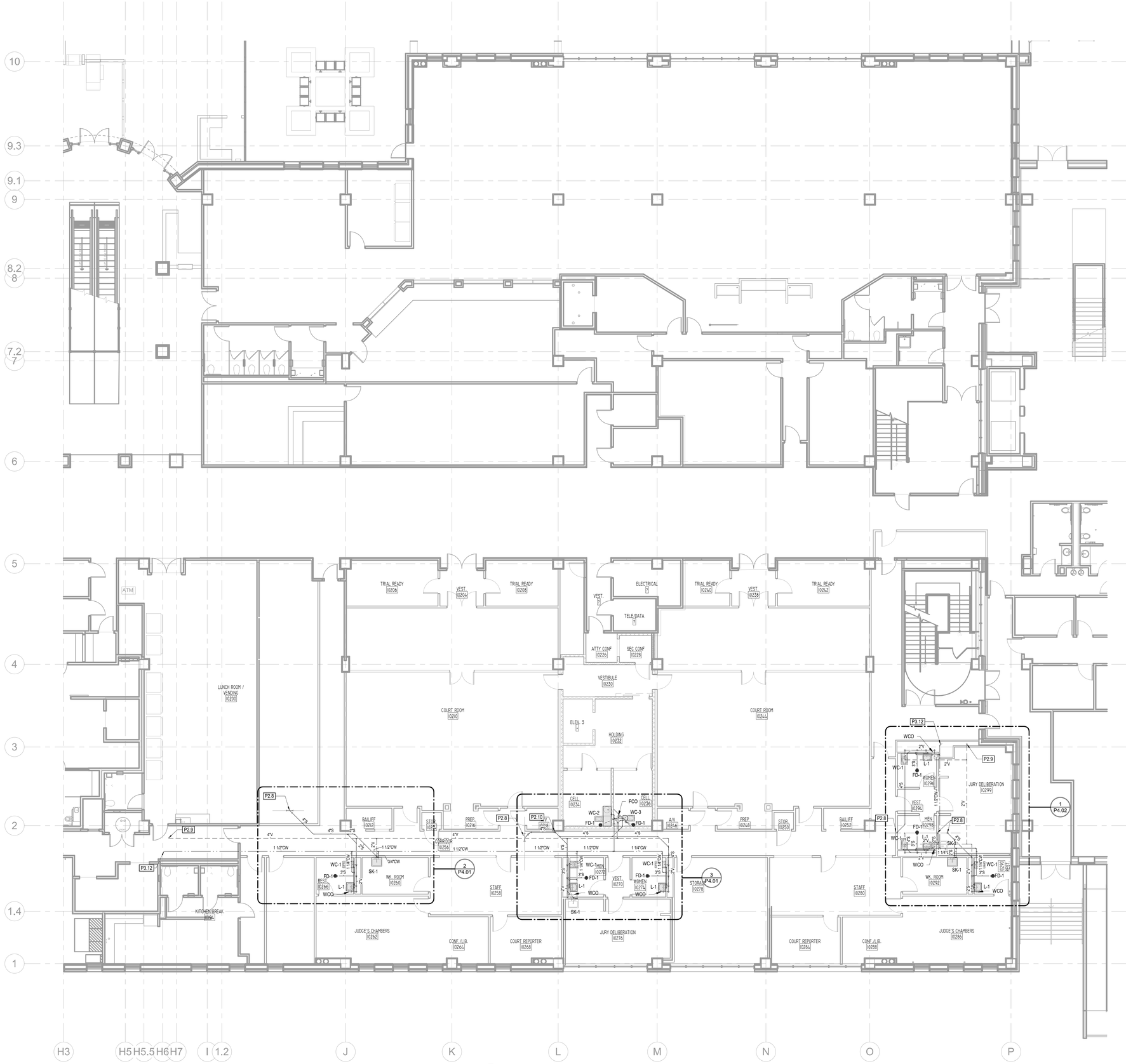


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P2.9 CONNECT NEW SANITARY VENT TO EXISTING SANITARY VENT. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION AND COORDINATE ROUTING WITH ALL TRADES TO AVOID INTERFERENCE

P2.10 NEW SANITARY SEWER LINE GO TO THE BASEMENT AND CONNECTS TO THE EXISTING SANITARY LINE ON SITE. SIZE AS INDICATED ON THE PLAN. THE CONTRACTOR MUST VERIFY THE EXACT SIZE AND LOCATION OF THE EXISTING SANITARY SEWER LINE IN THE FIELD.

P3.12 CONNECT NEW COLD WATER TO EXISTING COLD WATER. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION AND COORDINATE ROUTING WITH ALL TRADES TO AVOID INTERFERENCE

## 1 P2.12 LEVEL 1 PARTIAL PLUMBING PLAN B

1/8" = 1'-0"

TN PN


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**SHEET TITLE**

LEVEL 1 PARTIAL PLUMBING PLAN B

**SHEET NUMBER**

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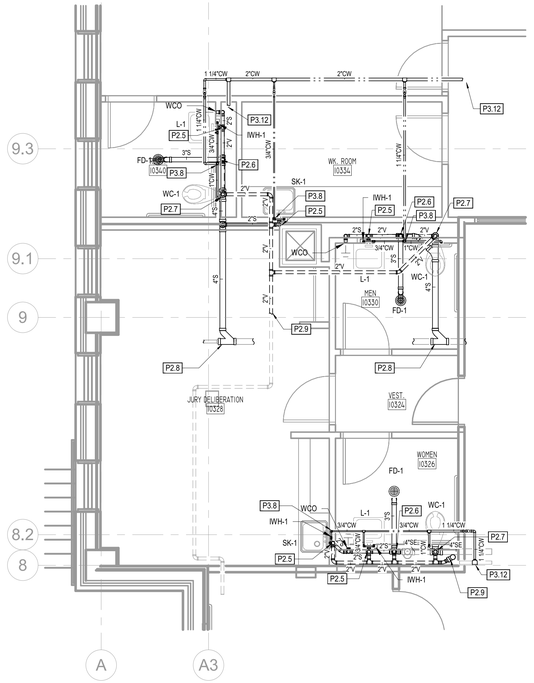
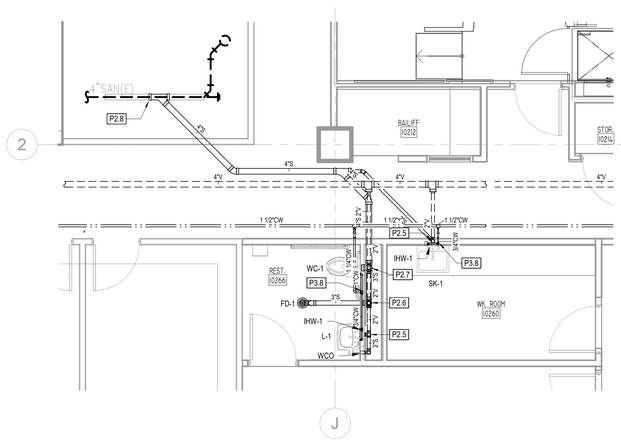


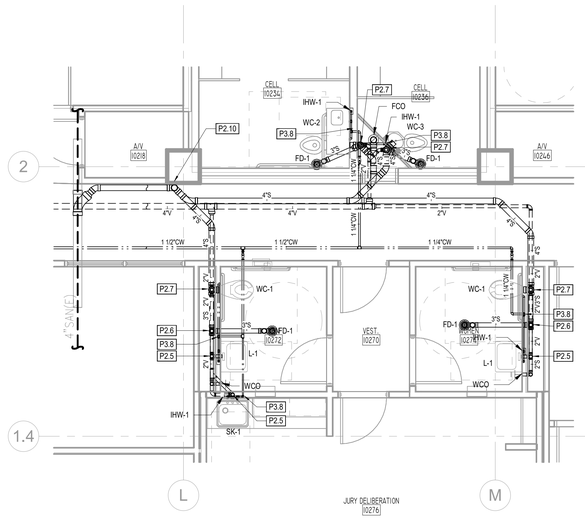

## 1 P4.01 ENLARGED RESTROOM A - PLUMBING PLAN A

1/4" = 1'-0"




## 2 P4.01 ENLARGED RESTROOM B - PLUMBING PLAN B

1/4" = 1'-0"




## 3 P4.01 ENLARGED RESTROOM C - PLUMBING PLAN B

1/4" = 1'-0"

## PLUMBING KEYED NOTES

P2.5 2" WASTE DOWN, 2" VENT UP.

P2.6 3" WASTE DOWN, 2" VENT UP.

P2.7 4" WASTE DOWN, 2" VENT UP.

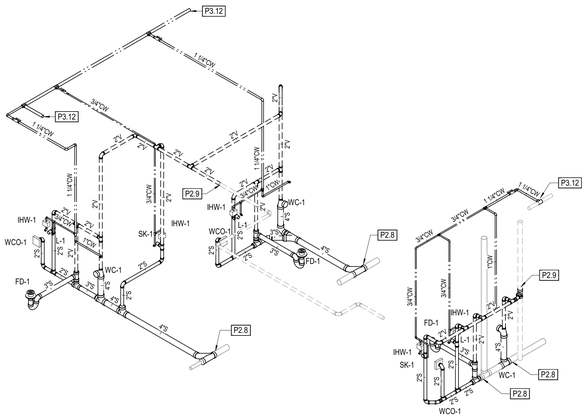
P2.8 CONNECT NEW SANITARY WASTE LINE TO EXISTING SANITARY WASTE LINE AT APPROXIMATE LOCATION TO SANITARY VERTICAL. SIZE AS NOTED ON THE PLAN. CONTRACTOR TO VERIFY EXACT SIZE AND LOCATION OF EXISTING SANITARY WASTE LINE IN THE FIELD

P2.9 CONNECT NEW SANITARY VENT TO EXISTING SANITARY VENT. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION AND COORDINATE ROUTING WITH ALL TRADES TO AVOID INTERFERENCE

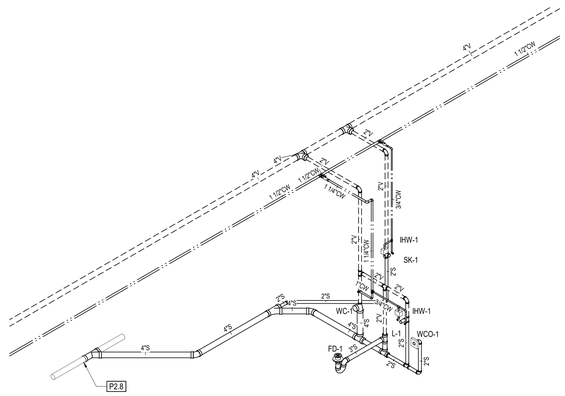
P2.10 NEW SANITARY SEWER LINE GO TO THE BASEMENT AND CONNECTS TO THE EXISTING SANITARY LINE ON SITE. SIZE AS INDICATED ON THE PLAN. THE CONTRACTOR MUST VERIFY THE EXACT SIZE AND LOCATION OF THE EXISTING SANITARY SEWER LINE IN THE FIELD.

P3.8 DROP COLD WATER DOWN INSIDE CHASE/WALL AND EXTEND TO SERVE ADJACENT FIXTURE(S). SIZE AS NOTED.

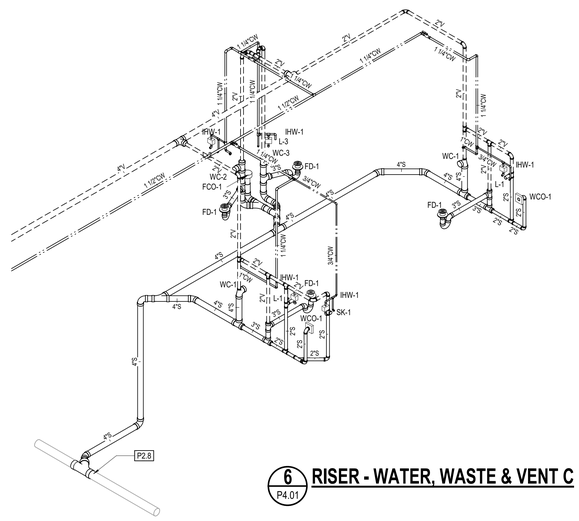
P3.12 CONNECT NEW COLD WATER TO EXISTING COLD WATER. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION AND COORDINATE ROUTING WITH ALL TRADES TO AVOID INTERFERENCE




## 4 P4.01 RISER - WATER, WASTE & VENT A




## 5 P4.01 RISER - WATER, WASTE & VENT B




## 6 P4.01 RISER - WATER, WASTE & VENT C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| DBR Project Number | 243028 |
|---|---|

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| | 10/17/2024 | ISSUE FOR PERMIT & BID |

PROJECT NAME

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

PROJECT LOCATION

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

PROJECT NUMBER

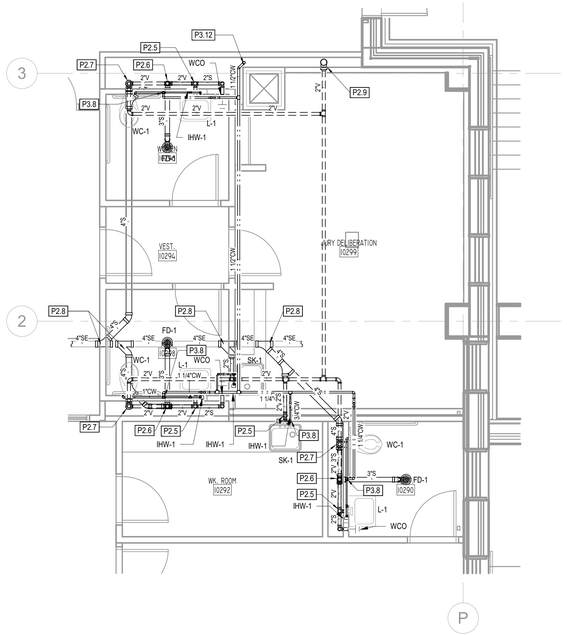
1007828.00

SHEET TITLE

PLUMBING RISERS AND SCHEMATICS

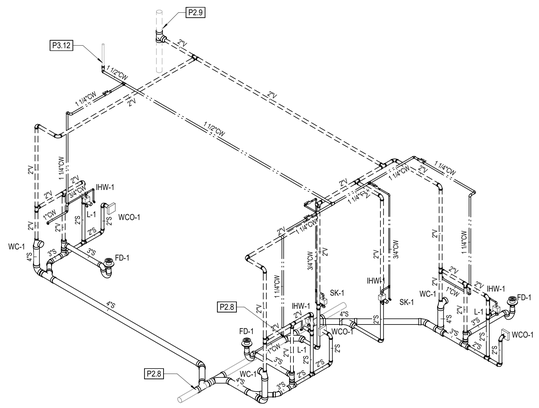
SHEET NUMBER

P4.01




1 P4.02 **ENLARGED RESTROOM D - PLUMBING PLAN B**

1/4" = 1'-0"




2 P4.02 **RISER - WATER, WASTE & VENT D**

## PLUMBING KEYED NOTES

P2.5 2" WASTE DOWN, 2" VENT UP.

P2.6 3" WASTE DOWN, 2" VENT UP.

P2.7 4" WASTE DOWN, 2" VENT UP.

P2.8 CONNECT NEW SANITARY WASTE LINE TO EXISTING SANITARY WASTE LINE AT APPROXIMATE LOCATION TO SANITARY VERTICAL. SIZE AS NOTED ON THE PLAN. CONTRACTOR TO VERIFY EXACT SIZE AND LOCATION OF EXISTING SANITARY WASTE LINE IN THE FIELD

P2.9 CONNECT NEW SANITARY VENT TO EXISTING SANITARY VENT. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION AND COORDINATE ROUTING WITH ALL TRADES TO AVOID INTERFERENCE

P3.8 DROP COLD WATER DOWN INSIDE CHASE/WALL AND EXTEND TO SERVE ADJACENT FIXTURE(S). SIZE AS NOTED.

P3.12 CONNECT NEW COLD WATER TO EXISTING COLD WATER. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION AND COORDINATE ROUTING WITH ALL TRADES TO AVOID INTERFERENCE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**REGISTRATION**

STATE OF TEXAS
MIKE L. ASHCRAFT
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PROFESSIONAL ENGINEER
10/17/2024


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**SHEET NUMBER**

P4.02


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TBPE Firm Registration No. 2234


| DBR Project Number | 243028 |
|---|---|

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

## PLUMBING FIXTURE SCHEDULE

| PLAN MARK | MINIMUM ROUGH -IN SIZES | | | | | DESCRIPTION |
|---|---|---|---|---|---|---|
| | WST & VENT | | DRAIN | CW | HW | |
| WATER CLOSET WC-1 | 4" | 2" | 4" | 1" | - | KOHLER No. K-84325-0 "KINGSTON ULTRA" WALL HUNG, VITREOUS CHINA, ELONGATED, SIPHON JET, SLOAN OPTIMA PLUS No. 8111-1.28 BATTERY OPERATED ELECTRONIC FLUSH VALVE. KOHLER No. K-4670-SC SOLID PLASTIC OPEN FRONT SEAT LESS COVER. WALL MOUNTED CARRIER, MOUNTED AT APPROVED ADA HEIGHT. |
| WATER CLOSET WC-2 | 4" | 2" | 4" | 1" | 1/2" | ACORN No. 1415-AL(AR)-2-BP-04-M-FV1.28-PH(C)-LW1-FVT-SW ADA LAVATORY / TOILET COMBINATION FIXTURE, ALL STAINLESS STEEL, AIR CONTROLLED PNEUMATICALLY OPERATED PUSH BUTTON VALVE THAT REQUIRES LESS THAN 5 PSI TO OPERATE, BLOWOUT TYPE TOILET, 1.28 GPF/0.5 GPM, SECURE TO WALL, STAINLESS STEEL PIN IN WASTE OUTLET AND FLOOR-TROL OPTION.PROVIDE WH-1 FOR WC-2 INSIDE OF 'CHASE (10510)' SHOWN ON PLAN P2.12. |
| WATER CLOSET WC-3 | 4" | 2" | 4" | 1" | 1/2" | ACORN No. 1449-RO-2-04-M-FVH1.28-PH-LWE-FVT-SW ADA LAVATORY/TOILET COMBINATION FIXTURE, ALL STAINLESS STEEL, AIR CONTROLLED PNEUMATICALLY OPERATED PUSH BUTTON VALVE THAT REQUIRES LESS THAN 5 PSI TO OPERATE, BLOWOUT TYPE TOILET, 1.28 GPF/0.5 GPM, SECURE TO WALL, STAINLESS STEEL PIN IN WASTE OUTLET AND FLOOR-TROL OPTION. PROVIDE WH-1 FOR WC-3 INSIDE OF 'CHASE (10510)' SHOWN ON PLAN P2.12. |
| LAVATORY L-1 | 2" | 2" | 2" | 3/4" | 3/4" | KOHLER No. K-2007-0 "KINGSTON" WALL HUNG WHITE VITREOUS CHINA, 21"x18" WITH 8" FAUCET CENTERS, FRONT OVERFLOW AND CONCEALED ARMS. SLOAN OPTIMA PLUS No. EBF-615-4 (0.5 GPM), BATTERY OPERATED ELECTRONIC ADA COMPLIANT FAUCET, 1-1/4" CHROME PLATED BRASS TAILPIECE WITH FLAT PERFORATED OPEN GRID STRAINER BRASS SPOUT AND WATER CONSERVING. McGUIRE No. 8872C CAST BRASS P-TRAP WITH CAST BRASS NUTS AND CLEANOUT PLUG. McGUIRE No. 170-LK LOOSE KEY ANGLE STOPS. WALL MOUNTED CARRIER. P-TRAP AND SUPPLIES TO BE WRAPPED WITH TRUEBRO INSULATION KIT. |
| SINK SK-1 | 2" | 2" | 2" | 1/2" | 1/2" | ELKAY No. LRAD-2522603 "LUSTERTONE" 25"x22"x9" DEEP SINGLE COMPARTMENT STAINLESS STEEL SELF RIMMING. DRILL FOR 3 FAUCET HOLES, No. LK-335 STAINLESS STEEL GRID STRAINER SPEAKMAN No. SC-3004-8-LD DUAL HANDLE FAUCET (1.5 GPM) WITH SWIVEL/RIGID GOOSENECK SPOUT, 4" WRIST BLADE HANDLES. McGUIRE No. 152 CHROME PLATED BRASS PERFORATED GRID STRAINER WITH 1 1/2" TAILPIECE. McGUIRE No. 167-LK SUPPLY ASSEMBLY WITH LOOSE KEY ANGLE VALVES. P-TRAP AND SUPPLIES TO BE WRAPPED WITH TRUEBRO INSULATION KIT. |
| INSTANTANEOUS WATER HEATER WH-1 | - | - | - | 1/2" | - | EEMAX No. MB0042777 POINT-OF-USE, TANKLESS UNIT WITH 4.1 KW OPERATION AT 277V/1PH POWER AND 56°F TEMPERATURE RISE. UNIT SHALL BE SET TO DELIVER A MAXIMUM OF 105°F TEMPERATURE AND BE INSTALLED BELOW THE FIXTURE BEHIND REMOVABLE ADA ACCESS PANEL OR WITHIN A VANDAL PROOF ENCLOSURE. |
| FLOOR DRAIN FD-1 | 3" | 2" | - | 1/2" | - | ZURN No. ZN-415B-P1/2" CAST IRON DRAIN WITH 6" DIAMETER TYPE 'B' STRAINER AND 1/2" IPS TRAP PRIMER CONNECTION |
| TRAP PRIMER TP-1 | - | - | - | 1/2" | - | PRESICION PLUMBING PRODUCTS No. FVP-1V8 FLUSH VALVE TRAP PRIMER WITH 1/2" TRAP PRIMER LINE AFFIX UNIT TO WATER CLOSET NEAREST TO THE FLOOR DRAIN SUPPLIED. ALL EXPOSED TO BE CHROME PLATED; CONCEALED DRAIN TUBING SHALL BE 1/2" TYPE 'K' SOFT COPPER. |
| TRAP PRIMER TP-2 | - | - | - | 1/2" | - | PRECISION PLUMBING No. DUALFLOW PRESSURE DROP ACTIVATED FULLY AUTOMATIC TRAP PRIMER VALVE WITH FOUR HOLE INTEGRAL AIR GAP/VACUUM BREAKER AND REPLACEABLE INLET FILTER SCREEN. INSTALL TRAP PRIMER IN CONCEALED, ACCESSIBLE LOCATION BEHIND APPROVED ACCESS PANEL OR EXPOSED IN MECHANICAL EQUIPMENT AREAS WITH APPROVED TRAP PRIMER DISTRIBUTION UNIT(S). INSTALL AT MINIMUM 15" A.F.F. |
| FLOOR CLEANOUT FCO | - | - | - | - | - | ZURN No. ZN-1400-HD HEAVY DUTY DURO-COATED CAST IRON CLEANOUT WITH WATERTIGHT ABS TAPERED THREAD PLUG AND ROUND SCORIATED CAST IRON ESTRA-HEAVY-DUTY SECURED TOP. INSTALL IN 18" X 18" THICK CONCRETE PAD. PROVIDE WITH HEAVY DUTY TOP AND BODY RATED FOR TRAFFIC LOADS. |
| WALL CLEANOUT WCO | - | - | - | - | - | ZURN No. ZB-1446-VP, CLEANOUT TEE, DURA-COATED CAST IRON BODY, WATERTIGHT ABS TAPERED THREADED PLUG, AND ROUND, SMOOTH STAINLESS STEEL WALL ACCESS COVER WITH VANDAL PROOF SCREWS. |

## PLUMBING PIPE MATERIALS SCHEDULE

| PIPING SYSTEM | PIPING MATERIAL |
|---|---|
| SANITARY DRAIN AND VENTS INSIDE BUILDING BELOW GRADE | SCHEDULE 40 PVC (UP TO 18") |
| SANITARY DRAIN AND VENTS INSIDE BUILDING ABOVE GRADE | CAST IRON NO-HUB |
| FIRE SPRINKLER ABOVE GROUND - 2 1/2" AND LARGER | BLACK STEEL SCHEDULE 10 |
| FIRE SPRINKLER ABOVE GROUND - 2" AND SMALLER | BLACK STEEL SCHEDULE 40 |
| DOMESTIC COLD WATER ABOUVE GROUND | COPPER, TYPE "L" HARD DRAWN |

## PLUMBING GENERAL NOTES:

A. PROVIDE COMPLETE PLUMBING SYSTEM AS REQUIRED FOR THE SCOPE OF THIS CONTRACT. FINAL SYSTEM DESIGN SHALL BE BUILT TO COMPLY WITH CURRENT PLUMBING, LOCAL CODE DEPARTMENT OF HEALTH, NFPA, AND OSHA REQUIREMENTS.

B. ALL CONSTRUCTION DEBRIS SHALL BE DISPOSED OF BY THE CONTRACTOR,UNLESS NOTED OTHERWISE.

C. THERE SHALL BE NOTHING ABANDONED IN PLACE, UNLESS SPECIFICALLY IDENTIFIED AS SUCH.

D. THESE PLANS ARE DIAGRAMMATIC IN NATURE, CONTRACTORS SHALL INCLUDE APPROPRIATE ALLOWANCES FOR OFFSETS AS REQUIRED TO ACCOMMODATE VERTICAL AND HORIZONTAL VARIATIONS IN THE LOCATIONS AND ELEVATIONS OF DUCTWORK, PIPING AND EXISTING CONDITIONS.

E. EACH TRADE SHALL COORDINATE THE ROUTING AND INSTALLATION OF HIS WORK WITH THAT OF ALL OTHER TRADES THROUGH THE GENERAL CONTRACTOR. IN ANY INSTANCES OF CONFLICT, SYSTEMS REQUIRING "GRADE" OR "SLOPE" FOR DRAINAGE (SANITARY SEWER, SANITARY VENT, EQUIPMENT DRAINS, ETC...) SHALL HAVE PRIORITY.

F. PENETRATIONS OF WALLS OR FLOORS FOR THE PASSAGE OF PIPING, OR OTHER EQUIPMENT SHALL BE PROPERLY SEALED AFTER INSTALLATION OF EQUIPMENT. FIELD VERIFY EXISTING WALL PENETRATIONS AND PROPERLY SEAL AS REQUIRED TO MAINTAIN WALL OR FLOOR RATING.

G. PROVIDE ALL EQUIPMENT, MATERIAL, LABOR, SUPERVISION, COSTS AND SERVICES REQUIRED TO INSTALL COMPLETE AND WORKING SYSTEMS,INCLUDING ALL ITEMS AND APPURTENANCES NECESSARY, REASONABLE, INCIDENTAL OR CUSTOMARILY INCLUDED, EVEN THOUGH EACH AND EVERY ITEM IS NOT SPECIFIED OR SHOWN ON DRAWINGS.

H. ALL WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, INCLUDING ADDENDA, AND APPLICABLE CODES AND STANDARDS.

I. PROVIDE ACCESS TO ALL CONCEALED EQUIPMENT AND VALVES. COORDINATE LOCATION OF ACCESS PANELS WITH ARCHITECT.

J. ALL FLOOR DRAINS, FLOOR SINKS, HUB DRAINS, OR INDIRECT CONNECTIONS SHALL BE PROVIDED WITH JR SMITH QUAD CLOSE IN LIEU OF TRAP PRIMER.

K. PROVIDE PVC SLEEVE FOR ANY PORTION OF THE GAS PIPING THAT IS ROUTED IN BUILDING, UNDER CONCRETE SLAB OR WALKWAY (TYPICAL)

L. EXTEND SANITARY SEWER, DOMESTIC WATER, FIRE, STORM AND GAS PIPING AS REQUIRED IN ORDER TO CONNECT TO STUB-OUT PROVIDED BY CIVIL.

M. ALL UTILITIES TO VENDOR EQUIPMENT SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS.

N. COORDINATE ALL FLOOR DRAIN, FLOOR SINK, HUB DRAIN, WALL AND FLOOR CLEANOUT LOCATIONS WITH ARHICTECT/OWNER AND EQUIPMENT VENDOR BOOK PRIOR TO INSTALLATION.

O. PROVIDE AND INSTALL BACKFLOW PREVENTERS ON SUPPLY LINES SERVING OWNER FURNISHED EQUIPMENT IN ACCORDANCE WITH LOCAL AND STATE CODES. REFER TO SPECIFICATIONS. ROUTE DRAIN LINE FROM RPZ TO AN APPROVED LOCATION.

P. DURING INSTALLATION FIELD MODIFICATIONS TO ROUTING MAY BE REQUIRED.

Q. CONTRACTOR TO VERIFY ALL INVERT ELEVATIONS FOR NEW PIPING CONNECTING TO CIVIL. NOTIFY ENGINEER OF ANY DISCREPANCIES.

R. NO PIPING SHALL RUN EXPOSED IN FINISHED AREAS.

S. PROVIDE WALL CLEANOUTS ON ALL FLOOR DRAINS, FLOOR SINKS, HUB DRAINS, FIXTURES, AND AT THE BASE OF ALL RISERS. MOUNT MINIMUM 12" A.F.F. TO KEEP WALL CLEANOUT OUT OF BASEBOARDS.

T. PROVIDE CHECK VALVES ON HOT AND COLD WATER SIDE BEFORE ALL THERMOSTATIC MIXING VALVES.

U. PROVIDE SHOCK ARRESTOR'S AT ALL QUICK CLOSING VALVES PER PLUMBING CODE AND LOCAL CODE.

V. ANY PIPING LOCATED IN RETURN AIR PLENUM SHALL BE PLENUM RATED PER TDH, PLUMBING AND LOCAL CODE.

W. VERIFY FINAL VENDOR EQUIPMENT DRAWINGS WITH OWNER PRIOR TO INSTALLATION.

X. PROVIDE FUNNEL DRAINS ON BACKFLOW DEVICES.


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**CLIENT**

THE STATE OF TEXAS FORT BEND COUNTY

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**REGISTRATION**

STATE OF TEXAS
MIKE L. ASHCRAFT
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10/17/2024

**DRAWING HISTORY**

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RICHMOND, TX 77469

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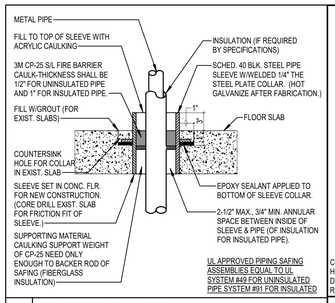
1007828.00

**SHEET TITLE**

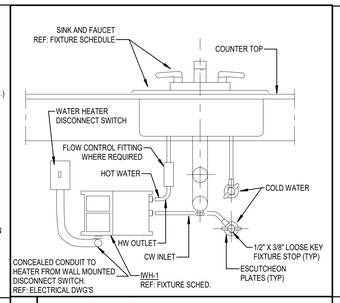
PLUMBING SCHEDULES

**SHEET NUMBER**

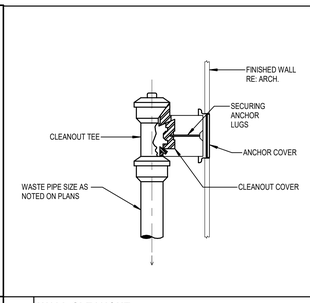
P5.01



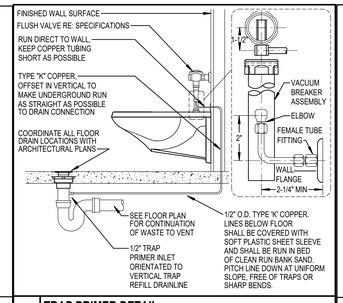

**1 PIPE PENETRATION DETAIL**
NOT TO SCALE
PTP-03



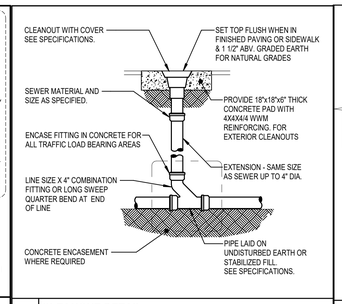

**2 WATER HEATER DETAIL**
NOT TO SCALE
PWHE-31



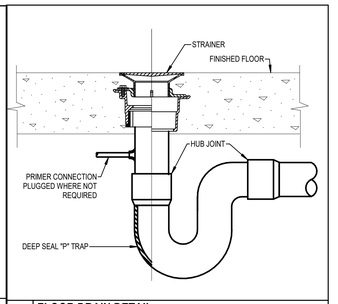

**3 WALL CLEANOUT**
NOT TO SCALE
PTP-21




**4 TRAP PRIMER DETAIL**
NOT TO SCALE
PTP-25




**5 CLEANOUT DETAIL**
NOT TO SCALE
PTP-09




**6 FLOOR DRAIN DETAIL**
NOT TO SCALE
PTP-06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**SHEET TITLE**

PLUMBING DETAILS

**SHEET NUMBER**

P6.01

## TECHNOLOGY LEGEND

| GROUP | SYMBOL | DESCRIPTION |
|---|---|---|
| DEVICES | ▽ | INDICATES THE LOCATION OF A NEW TECHNOLOGY OUTLET. CONTRACTOR TO PROVIDE FACEPLATE WITH A MINIMUM OF 4-PORTS AT EACH LOCATION UNLESS OTHERWISE NOTED. ELECTRICAL CONTRACTOR TO PROVIDE A DOUBLE GANG BACK BOX WITH A SINGLE GANG REDUCER RING AND A 1" EMT CONDUIT FROM THE BOX TO THE NEAREST ACCESSIBLE CEILING. SOME EXISTING BUILDINGS MAY REQUIRE SURFACE MOUNTED RACEWAY. ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL RACEWAY AS SPECIFIED AND DESIGNATE IN THE ELECTRICAL CONTRACT DOCUMENTS. SYSTEM INSTALLER TO PROVIDE AND INSTALL A PLASTIC PROTECTIVE BUSHING, ON EACH CONDUIT STUB-OUT, TO PREVENT CABLE DAMAGE. |
| | ▽ | INDICATES THE LOCATION OF A FLOOR MOUNTED TECHNOLOGY OUTLET. ELECTRICAL CONTRACTOR TO PROVIDE AND INSTALL A FLOOR BOX WITH (1) 1" CONDUIT PER EVERY (6) CABLES INSTALLED. ALL CONDUITS SHALL ROUT FROM THE FLOOR BOX, DIRECTLY TO THE WALL INDICATED AND STUB-UP INTO THE NEAREST ACCESSIBLE PLENUM CEILING |
| | ⌖ | INDICATES THE LOCATION OF A CEILING MOUNTED OUTLET. CONTRACTOR SHALL MOUNT THIS OUTLET AT +12" ABOVE THE CEILING AND COORDINATE ALL FINAL LOCATIONS WITH OTHER TRADES ON THE PROJECT TO VERIFY THAT THE LOCATION OF THE OUTLET MAINTAINS 12" OF CLEARANCE FROM THE FRONT OF THE FACEPLATE FOR OWNER ACCESS. ELECTRICAL CONTRACTOR SHALL ROUTE (1) 1" CONDUIT FROM THE BUILDING STRUCTURE TO A SINGLE GANG BACK BOX MOUNTED AT 5' OR LESS ABOVE THE FINISHED CEILING. SECURE CONDUIT AND BACK BOX TO INSURE MINIMAL SWAY MOVEMENT. |
| | 'D#' | DESIGNATES THAT THE ASSOCIATED TECHNOLOGY OUTLET IS INTENDED FOR THE USE OF A NETWORK CONNECTION. THE '#' SHALL BE REPLACED WITH NUMERIC TEXT THAT IDENTIFIES THE TOTAL NUMBER OF CATEGORY 6, NETWORK CABLES THAT ARE TO BE INSTALLED AT THE TECHNOLOGY OUTLET LOCATION. CONTRACTOR TO PROVIDE AND INSTALL CATEGORY 6 NETWORK CABLES, CATEGORY 6 CONNECTORS, STAINLESS STEEL FACEPLATES WITH IDENTIFICATION WINDOWS, LABELS, BLANK INSERTS, AND ANY OTHER MATERIALS REQUIRED TO FURNISH A COMPLETE FUNCTIONAL AND TESTED OUTLET LOCATION. ALL FACEPLATES PROVIDED SHALL CONTAIN A MIMIMUM 4-PORTS AND SHALL BE APPROPRIATELY SIZED TO ACCOMMODATE THE NUMBER OF CIRCUITS BEING INSTALLED AT THIS TECHNOLOGY OUTLET LOCATION. MAXIMUM OF SIX(6) DATA CABLES PER OUTLET. |
| | 'W' | DESIGNATES THAT THE ASSOCIATED TECHNOLOGY OUTLET IS INTENDED FOR THE USE OF A WALL MOUNTED TELEPHONE CONNECTION. CONTRACTOR TO PROVIDE AND INSTALL (1) CATEGORY 6 NETWORK CABLE, (1) CATEGORY 6 CONNECTOR, STAINLESS STEEL WALL TELEPHONE FACEPLATE, LABELS, AND ANY OTHER MATERIALS REQUIRED TO FURNISH A COMPLETE FUNCTIONAL AND TESTED CIRCUIT AT EACH LOCATION SHOWN. CONTRACTOR SHALL MOUNT THIS OUTLET AT +42" AFF AND COORDINATE ALL FINAL LOCATIONS WITH OTHER TRADES ON THE PROJECT TO VERIFY THAT THE LOCATION OF THE OUTLET MAINTAINS 8" OF CLEARANCE ON ALL FOUR SIDES OF THE BACK BOX. OUTLETS SHALL REMAIN CLEAR OF ROOM DOORS, CABINET DOORS, APPLIANCE DOORS, AND SLIDING DRAWERS. |
| | 'AP' | DESIGNATES THAT THE ASSOCIATED TECHNOLOGY OUTLET IS INTENDED FOR THE USE OF A WIRELESS ACCESS POINT CONNECTION. CONTRACTOR TO PROVIDE AND INSTALL (1) CATEGORY 6 NETWORK CABLE, (1) CATEGORY 6 CONNECTOR, STAINLESS STEEL FACEPLATE WITH IDENTIFICATION WINDOWS, LABELS, AND ANY OTHER MATERIALS REQUIRED TO FURNISH A COMPLETE FUNCTIONAL AND TESTED CIRCUIT AT EACH LOCATION SHOWN. REFERENCE SPECIFICATIONS FOR PATCH CABLE REQUIREMENTS. |
| | ●◀ ●◀ | INDICATES THE LOCATION OF AN IP VIDEO SURVEILLANCE CAMERA. CONTRACTOR TO PROVIDE AND INSTALL CATEGORY 6 NETWORK CABLES, CATEGORY 6 CONNECTORS, STAINLESS STEEL FACEPLATES WITH IDENTIFICATION WINDOWS, LABELS, BLANK INSERTS, AND ANY OTHER MATERIALS REQUIRED TO FURNISH A COMPLETE FUNCTIONAL AND TESTED OUTLET LOCATION. ALL FACEPLATES PROVIDED SHALL SHALL BE APPROPRIATELY SIZED TO ACCOMMODATE THE NUMBER OF CIRCUITS BEING INSTALLED AT THIS OUTLET LOCATION. REFERENCE SPECIFICATIONS FOR PATCH CABLE REQUIREMENTS. |
| | 'B' | INDICATES THAT THE ASSOCIATED TECHNOLOGY OUTLET IS INTENDED FOR FUTURE USE. CONTRACTOR TO PROVIDE STAINLESS STEEL, SINGLE-GANG WALL PLATE AT ALL LOCATIONS. |

NOTES:
REFERENCE TECHNOLOGY GENERAL NOTES, PLAN KEYED NOTES, AND ALL OTHER SYSTEM LEGENDS/NOTES. THE STRUCTURED CABLING SYSTEM,CONTRACTOR SHALL PROVIDE AND INSTALL CATEGORY 6 CABLE TO ALL SYSTEMS' EQUIPMENT REQUIRING NETWORK CONNECTIVITY.

## VIDEO SURVEILLANCE LEGEND

| GROUP | SYMBOL | DESCRIPTION |
|---|---|---|
| DEVICES | ●◀ | INTERIOR VIDEO SURVEILLANCE CAMERA. |
| | ●◀ | VANDAL RESISTANT, WEATHER PROOF, EXTERIOR SECURITY CAMERA. |
| | VRS | VIDEO RECORDING SERVER. REFERENCE SPECIFICATIONS FOR INFORMATION CONCERNING ANALOG OR IP-BASED TYPE SYSTEM. |
| | #MU | INDICATES THE LOCATION OF A VIDEO SURVEILLANCE MAIN |

NOTES:
1. REFERENCE VIDEO SURVEILLANCE SCHEDULE AND DIVISION 28 SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS

## INTRUSION DETECTION LEGEND

| GROUP | SYMBOL | DESCRIPTION |
|---|---|---|
| DEVICES | IDP | DESIGNATES THE LOCATION OF THE INTRUSION DETECTION SYSTEM, CONTROL PANEL, ELECTRICAL CONTRACTOR TO PROVIDE 120V POWER TO PANEL |
| | DC | FLUSH MOUNTED MAGNETIC DOOR CONTACT. |
| | SDC | SURFACE MOUNTED MAGNETIC DOOR CONTACT. |
| | ODC | OVERHEAD DOOR, SURFACE MOUNTED DOOR CONTACT. |
| | KP | INTRUSION DETECTION SYSTEM ARM/DISARM KEYPAD. |
| | M | STANDARD RANGE WALL MOUNTED MOTION DETECTOR. |
| | M | MEDIUM RANGE WALL MOUNTED MOTION DETECTOR. |
| | M | LONG RANGE WALL MOUNTED MOTION DETECTOR. |
| | M | CEILING MOUNTED, 360° MOTION DETECTOR. |
| | R | RELAY/MONITOR MODULE |
| | DB | DURESS BUTTON |
| | WSR | WIRELESS SECURITY RECEIVER. ELECTRICAL CONTRACTOR TO PROVIDE ONE (1) SINGLE GANG BACK BOX WITH A 1" CONDUIT ROUTING TO THE NEAREST ACCESSIBLE CEILING. MOUNT AT 12" BELOW THE FINISHED CEILING, BUT DO NOT EXCEED 12'-0" AFF. |
| | GB | CEILING MOUNTED GLASS BREAK DETECTOR |

NOTES:
1. REFERENCE ACCESS CONTROL SCHEDULE, DIVISION 8 AND DIVISION 28 SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS

## ACCESS CONTROL LEGEND

| GROUP | SYMBOL | DESCRIPTION |
|---|---|---|
| DEVICES | CR | WALL OR MULLION MOUNTED ACCESS CONTROL PROXIMITY CARD READER. |
| | CR | ACCESS CONTROL PROXIMITY CARD READER THAT IS INTEGRATED INTO THE DOOR HARDWARE. |
| | DR | DOOR RELEASE BUTTON |
| | PIR | MOTION REQUEST TO EXIT DEVICE |
| | ACP | DESIGNATES THE LOCATION OF THE ACCESS CONTROL SYSTEM, CONTROL PANEL. ELECTRICAL CONTRACTOR TO PROVIDE 120V POWER TO PANEL. PROVIDE NETWORK CABLE TO PANEL AND COORDINATE WITH THE OWNER'S TECHNOLOGY DEPARTMENT ON ACQUIRING AN IP ADDRESS. |
| | DS | WALL OR MULLION MOUNTED, 2-WAY AUDIO/VIDEO INTERCOM DOOR STATION. |
| | DS | DOOR MOUNTED, 2-WAY AUDIO/VIDEO INTERCOM DOOR STATION. |
| | MS | 2-WAY AUDIO/VIDEO INTERCOM MASTER STATION. |
| | PB | ADA AUTO DOOR OPEN BUTTON. SHOWN FOR REFERENCE ONLY, BUTTON AND AUTO DOOR OPERATOR PROVIDED AND INSTALLED BY THE DOOR SYSTEM INSTALLER. |
| | DO | AUTO DOOR OPERATOR. OPERATOR TO BE PROVIDED AND INSTALLED BY THE DOOR SYSTEM INSTALLER. |
| | LA | WALL MOUNTED, LOCAL ALARM SOUNDER. |
| | DC | DPDT MAGNETIC DOOR CONTACT/DOOR POSITION SENSOR. FLUSH MOUNTED IN DOOR FRAME, UNLESS NOTED OTHERWISE |

NOTES:
1. REFERENCE ACCESS CONTROL SCHEDULE, DETAILS, AND DIVISION 28 SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS

## AUDIO/VIDEO LEGEND

| GROUP | SYMBOL | DESCRIPTION |
|---|---|---|
| DEVICES | #MP | INDICATES THE LOCATION OF A VIDEO PROJECTOR # TO BE REPLACED WITH "C" OR "W". "C" INDICATES THAT THE DEVICE IS A CEILING MOUNTED DEVICE AND "W" INDICATES IT IS TO BE WALL MOUNTED. CONTRACTOR TO PROVIDE AND INSTALL A PROJECTOR, CEILING OR WALL MOUNTING KIT, AND PATCH CABLES AS REQUIRED TO CONNECT AT BOTH ENDS. |
| | 'AV-*#' | INDICATES THAT THE DESIGNATED TECHNOLOGY OUTLET IS INTENDED FOR AN AUDIO/VIDEO (A/V) INPUT. CONTRACTOR TO PROVIDE AND INSTALL A FLOOR MOUNTED OR WALL MOUNTED BOX AS INDICATED. (2) 1.25" CONDUITS FROM THE BOX TO THE NEAREST, PLENUM ACCESSIBLE CEILING WITHIN THE SAME ROOM. ALL FLOOR AND WALL MOUNTED BOXES SHALL BE A MINIMUM OF 2-GANGS.<br>*# - WHEN REPLACED WITH A '1' (AV-1) ONLY, THE OUTLET SHALL BE A STANDALONE, LOCAL INPUT TIED TO A LOCAL VIDEO DISPLAY (FSD, CMP, WMP, AV-2, ETC.). THIS OUTLET WILL NOT BE ASSOCIATED WITH ANY SYSTEM FOR ROUTING TO DISPLAYS LOCATED IN ANY OTHER PORTION OF THE PROJECT. IF NOT REPLACED WITH A '1' SEE THE NOTES AT THE BOTTOM OF THE LEGEND FOR ADDITIONAL INSTRUCTIONS. |
| | 'FSD-*#' | INDICATES THE LOCATION OF A FLAT PANEL VIDEO DISPLAY. CONTRACTOR TO PROVIDE AND INSTALL TWO (2) CATEGORY 6 UTP NETWORK CABLE TO ALL LOCATIONS SHOWN ON THE ENTIRE PROJECT.<br>*# - WHEN REPLACED WITH A '1' (FSD-1) ONLY, THE OUTLET SHALL BE A STANDALONE AND ONLY HAVE THE CATEGORY 6 CABLE ROUTED TO IT, FROM THE MDF/IDF SERVING THE DEVICES AREA ROOM.<br>*# - WHEN REPLACED WITH A '2' (FSD-2) ONLY, THE OUTLET SHALL HAVE THE CATEGORY 6 CABLE ROUTED TO IT, FROM THE MDF/IDF SERVING THE DEVICES AREA, AND THE CABLING FROM THE ASSOCIATED AV-1.<br>EACH FSD OUTLET SHALL BE A 2-GANG BOX AND TWO (2) 1.25" CONDUITS STUBBING INTO THE ROOMS ACCESSIBLE CEILING. PROVIDE ONE DOUBLE-GANG FACEPLATE WITH TWO (2) DECORA PORTS. PROVIDE A DECORA STYLE INSERT THAT ACCEPTS THE STYLE OF DATA JACK BEING USED FOR STRUCTURED CABLING. WHEN THERE IS A LOCAL A/V INPUT ASSOCIATED WITH THE DISPLAY, PROVIDE A DECORA INSERT THAT CONFORMS WITH THE SYSTEMS SPECIFIED. OTHERWISE PROVIDE A BLANK INSERT IN THE SECOND PORT. |
| | 'IVD' | INDICATES THE LOCATION OF A WALL MOUNTED, INTERACTIVE VIDEO DISPLAY. PROVIDE AND INSTALL A/V CABLE FROM THE ASSOCIATED AV-1 AS PER SYSTEM SPECIFICATIONS. RACEWAY SHALL CONSIST OF A 2-GANG BOX AND TWO (2) 1.25" CONDUITS STUBBING INTO THE ROOMS ACCESSIBLE CEILING. PROVIDE ONE DOUBLE-GANG FACEPLATE WITH TWO (2) DECORA PORTS. PROVIDE A DECORA STYLE INSERT THAT ACCEPTS THE STYLE OF DATA JACK BEING USED FOR STRUCTURED CABLING. WHEN THERE IS A LOCAL A/V INPUT ASSOCIATED WITH THE DISPLAY, PROVIDE A DECORA INSERT THAT CONFORMS WITH THE SYSTEMS SPECIFIED. OTHERWISE PROVIDE A BLANK INSERT IN THE SECOND PORT. |
| | 'USB-T' | INDICATES THE LOCATION OF A USB INPUT PLATE THAT SHALL TRANSMIT USB SIGNAL TO THE ASSOCIATED USB OUTPUT PLATE. RACEWAY SHALL CONSIST OF ONE (1) 1" CONDUIT AND A SINGLE GANG BACK BOX. |
| | 'USB-R' | INDICATES THE LOCATION OF A USB OUTPUT PLATE THAT SHALL RECEIVE USB SIGNAL FROM THE USB ASSOCIATED INPUT PLATE. RACEWAY SHALL CONSIST OF ONE (1) 1" CONDUIT AND A SINGLE GANG BACK BOX. |
| | S *# | INDICATES THE LOCATION OF A LOCAL SOUND REINFORCEMENT/PRESENTATION SPEAKER.<br>*# - WHEN REPLACED WITH AN 'L', THE SPEAKER SHALL BE FOR LOCAL INSTRUCTIONAL PRESENTATION AUDIO AND POWERED BY THE SPECIFIED CLASSROOM PRESENTATION AMPLIFIER.<br>*# - WHEN REPLACED WITH 'SM', THE SPEAKER SHALL BE DEDICATED TO A SPEECH PRIVACY/SOUND MASKING SYSTEM. |
| | AVC *# | INDICATES THE LOCATION OF AN AUDIO/VIDEO CONTROL PLATE. RACEWAY SHALL CONSIST OF ONE (1) A BACK BOX WITH A 1" CONDUIT ROUTING INTO THE ACCESSIBLE CEILING SPACE WITHIN THE SAME ROOM. AV SYSTEM INSTALLER TO COORDINATE THE CONTROL BACK BOX SIZE REQUIREMENT WITH THE PROJECT'S ELECTRICAL CONTRACTOR. |

NOTES:
A. IN THE EVENT THAT "#" IS NOT DEFINED IN THE OUTLET DESCRIPTION, THE DEVICE SHALL BE CONSIDERED A STANDALONE DEVICE, SERVING THE SYSTEM WITHIN THE SAME SPACE OR THE FOLLOWING SHALL APPLY:
'*# - UNLESS SPECIFICALLY NOTED OTHERWISE, THE FOLLOWING SHALL APPLY TO EACH DEVICE SHOWN ON THE ENTIRE PROJECT:
* SHALL BE REPLACED WITH ALPHABETICAL CHARACTERS THAT SHALL INDICATE THE SPECIFIC VENUE THAT THE DEVICE IS ASSOCIATED WITH.
# SHALL BE REPLACED WITH A NUMERIC VALUE THAT SHALL IDENTIFY THE SPECIFIC DEVICE WITHIN THE SPECIFIC VENUE.
B. THE AUDIO/VIDEO SYSTEM INTEGRATOR SHALL COORDINATE ALL BOX AND CONDUIT SIZE REQUIREMENTS PRIOR TO ROOUGH-IN BY THE PROJECTS ELECTRICAL CONTRACTOR.
C. REFERENCE SCOPE MATRIX AND PROJECT SPECIFICATIONS FOR INSTRUCTIONS REGARDING THE PROVIDING AND INSTALLATION OF VIDEO DISPLAYS, PROJECTORS, SCREENS, MOUNTS, AND LIFTS.

## TYPICAL SUBSCRIPTS LEGEND

| TEXT | DESCRIPTION |
|---|---|
| 'WM' | INDICATES THAT THE DESIGNATED DEVICE IS TO BE WALL MOUNTED AT SPECIFIED HEIGHT OR IN COMPLIANCE WITH CODE REQUIREMENTS. ALL WALL MOUNTED HEIGHTS ARE TO BE CONFIRMED WITH THE PROJECT'S ARCHITECT PRIOR TO ROUGH-IN. |
| 'WP' | INDICATES THAT THE DESIGNATED DEVICE SHALL BE WEATHER PROOF AND RATED FOR EXTERIOR CONDITIONS INSTALLATION. |
| 'AC' | INDICATES THAT THE DESIGNATED DEVICE IS TO BE INSTALLED ABOVE THE COUNTERTOP. A NUMERIC VALUE SHALL REPLACE THE '#' SYMBOL AND SHALL DESIGNATE THE SPECIFIC HEIGHT ABOVE COUNTER. ALL HEIGHTS ARE TO BE CONFIRMED WITH THE PROJECT'S ARCHITECT PRIOR TO ROUGH-IN. |
| 'AFF' | INDICATES THAT THE DESIGNATED DEVICE IS TO BE INSTALLED ABOVE THE FINISHED FLOOR. A NUMERIC VALUE SHALL REPLACE THE '#' SYMBOL AND SHALL DESIGNATE THE SPECIFIC HEIGHT ABOVE FINISHED FLOOR. ALL HEIGHTS ARE TO BE CONFIRMED WITH THE PROJECT'S ARCHITECT PRIOR TO ROUGH-IN. |
| 'AG' | INDICATES THAT THE DESIGNATED DEVICE IS TO BE INSTALLED ABOVE THE GRADE LEVEL. A NUMERIC VALUE SHALL REPLACE THE '#' SYMBOL AND SHALL DESIGNATE THE SPECIFIC HEIGHT ABOVE GRADE. ALL HEIGHTS ARE TO BE CONFIRMED WITH THE PROJECT'S ARCHITECT PRIOR TO ROUGH-IN. |
| 'SM' | INDICATES THAT THE DESIGNATED DEVICE IS TO BE SURFACE MOUNTED. CONTRACTOR TO PROVIDE ALL MATERIALS REQUIRED FOR A COMPLETE, SURFACE MOUNTED SOLUTION. ALL SURFACE MOUNTED PRODUCTS SHALL BE APPROVED BY THE PROJECT'S ARCHITECT PRIOR TO PROCUREMENT AND/OR INSTALLATION. |
| 'UC' | INDICATES THAT THE DESIGNATED DEVICE IS TO BE MOUNTED ON THE UNDERSIDE OF THE ELEVATED CANOPY. |
| 'UF' | INDICATES THAT THE DESIGNATED DEVICE IS TO BE INSTALLED UNDER A RAISED FLOOR SYSTEM. |
| 'CM' | INDICATES THAT THE DESIGNATED DEVICE IS TO BE CORNER MOUNTED AT SPECIFIED HEIGHT. ALL WALL MOUNTED HEIGHTS ARE TO BE CONFIRMED WITH THE PROJECT'S ARCHITECT PRIOR TO ROUGH-IN. |

## GENERAL NOTES

1. ALL 120V POWER REQUIRED FOR THE FUNCTIONALITY OF EACH SYSTEM SHALL BE A DEDICATED CIRCUIT AND ON EMERGENCY POWER WHEN AVAILABLE. PROJECTS ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL POWER TO MAIN CONTROL PANELS, REMOTE POWER SUPPLIES AND ALL HEAD END EQUIPMENT. SYSTEM INSTALLERS SHALL COORDINATE LOCATIONS AND CONNECTIONS WITH THE PROJECT'S ELECTRICAL CONTRACTOR.
2. THE PROJECT'S ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL IN CONDUITS, BACK BOXES, JUNCTION BOXES, RACEWAYS, AND SLEEVES REQUIRED TO ESTABLISH CLEAR PATHWAYS FOR ALL SYSTEMS. ALL CONDUITS, SLEEVES, BOXES, AND RACEWAYS SHALL BE PROPERLY SIZED TO MAINTAIN A 40% MAXIMUM FILL RATIO.
3. ALL EXPOSED SYSTEM'S WIRING OR WIRING ROUTING ACROSS NON ACCESSIBLE CEILINGS SHALL BE ROUTED IN CONDUIT, PROVIDED AND INSTALLED BY THE PROJECT'S ELECTRICAL CONTRACTOR. SIZE CONDUIT AS REQUIRED TO ROUTE SYSTEMS WITH 40% CABLE FILL RATIO. MINIMUM CONDUIT SIZE SHALL BE 3/4".
4. EACH SYSTEM INSTALLER SHALL BE RESPONSIBLE FOR ENSURING ALL EXTERIOR WALL PENETRATIONS ARE PROPERLY SEALED TO PREVENT ANY MOISTURE FROM ENTERING BUILDING.
5. NO CONDUITS SHALL BE INSTALLED ON THE EXTERIOR OF THE BUILDING. IF EXTERIOR CONDUITS ARE REQUIRED FOR A COMPLETE INSTALLATION, EACH SYSTEM CONTRACTOR SHALL COORDINATE WITH THE PROJECTS CONSULTANT PRIOR TO ANY ROUGH-IN.
6. EACH SYSTEM INSTALLER SHALL PROVIDE AND INSTALL PROTECTIVE BUSHINGS ON ALL CONDUIT STUB OUTS AND SLEEVES TO PREVENT CABLE DAMAGE. BUSHING TO BE INSTALLED PRIOR TO CABLE INSTALLATION. CUTTING BUSHING AND INSTALLING AFTER CABLE IS INSTALLED WILL NOT BE EXCEPTED.
7. ALL CABLE SHALL BE ROUTED DOWN CORRIDORS, PARALLEL AND PERPENDICULAR TO THE BUILDING WALLS AND STRUCTURE. CABLE TO EACH DEVICE SHALL BRANCH OFF OF A MAIN CORRIDOR TRUNK. ROUTING CABLES THROUGH CLASSROOMS, OFFICES, STORAGE ROOMS, RESTROOMS OR ANY TYPE OF ROOM OTHER THAN A CORRIDOR WILL NOT BE ACCEPTED. ENTER ALL ROOMS ABOVE THE ASSOCIATED ROOM DOORWAY.

## LOCAL SOUND SYSTEM LEGEND

| GROUP | SYMBOL | DESCRIPTION |
|---|---|---|
| DEVICES | S *# | VENUE SPECIFIC LOCAL SOUND SYSTEM SPEAKER. '#' TO BE REPLACED WITH ALPHANUMERIC TEXT INDICATING THE ASSOCIATED VENUE AND SPEAKER NUMBER. |
| | LSC *# | VENUE SPECIFIC LOCAL SOUND SYSTEM CONTROL PLATE. '#' TO BE REPLACED WITH ALPHANUMERIC TEXT INDICATING THE ASSOCIATED VENUE AND CONTROL PLATE NUMBER. |
| | M *# | VENUE SPECIFIC LOCAL SOUND SYSTEM MICROPHONE INPUT. '#' TO BE REPLACED WITH ALPHANUMERIC TEXT INDICATING THE ASSOCIATED VENUE AND MIC INPUT NUMBER. |
| | H *# | VENUE SPECIFIC LOCAL SOUND SYSTEM HANGING MICROPHONE. '#' TO BE REPLACED WITH ALPHANUMERIC TEXT INDICATING THE ASSOCIATED VENUE AND MIC NUMBER. |
| | ABM *# | VENUE SPECIFIC LOCAL SOUND SYSTEM 3.5MM AUXILIARY INPUT AND BLUETOOTH MIXER. '#' TO BE REPLACED WITH ALPHANUMERIC TEXT INDICATING THE ASSOCIATED VENUE AND MIXER NUMBER. CONTRACTOR TO PROVIDE AND INSTALL A RECESSED ENCLOSURE WITH FLUSH MOUNTED, LOCKABLE DOOR. DEVICE TO BE MOUNTED AT +42" AFF. |
| | RACK | INDICATED THE LOCATION OF THE VENUE SPECIFIC LOCAL SOUND SYSTEM HEAD END RACK. AMPLIFIERS, DSPS, AND ALL OTHER HEAD END EQUIPMENT SHALL BE INSTALLED IN THIS RACK/CABINET. |
| | WA | WIRELESS MICROPHONE ANTENNA. REFERENCE SPECIFICATIONS FOR MORE INFORMATION. |
| | ALA | ASSISTED LISTENING ANTENNA. REFERENCE SPECIFICATIONS FOR MORE INFORMATION. |

NOTES:
1. REFERENCE SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS

## SUBSCRIPTS LEGEND - EXISTING DEVICES

| TEXT | DESCRIPTION |
|---|---|
| 'E' | INDICATES THAT THE DEVICE IS EXISTING TO REMAIN. CONTRACTOR TO REMOVE DEVICE AND PLACE IN THE SAME LOCATION AS NEEDED. |
| 'D' | INDICATES THAT THE DEVICE IS EXISTING AN IS TO BE REMOVED. CONTRACTOR TO REMOVE THE DEVICE AND RETURN TO OWNER. |
| 'R' | INDICATES THAT THE DEVICE IS EXISTING AND SHALL BE REPLACED. REFERENCE NEW SYSTEM LAYOUT FOR EXACT LOCATIONS. |
| 'RR' | INDICATES THAT THE DEVICE IS EXISTING AND SHALL BE REMOVED AND RELOCATED TO A LOCATION INDICATED ON THE DRAWINGS. REFERENCE NEW SYSTEM LAYOUT FOR EXACT LOCATIONS. |

## COMMUNICATIONS

HS DS SCHOOL INTERCOMMUNICATION SYSTEM HANDSET.

DEFAULT ELEVATION (UNLESS INDICATED OTHERWISE) TO CENTER OF ROUGH-IN: 42" AFF

VC VOLUME CONTROL - WALL MOUNTED
CB INTERCOM/PA SYSTEM CALL-IN OR CALL-BACK DEVICE

DEFAULT ELEVATION (UNLESS INDICATED OTHERWISE) TO CENTER OF ROUGH-IN: 120" AFF OR 12" BELOW CEILING, WHICHEVER IS LOWER

S L INTERCOM/PA SPEAKER.
"L" LOCAL SOUND REINFORCEMENT

CEILING MOUNTED DEVICES:
S VC INTERCOM/PA SPEAKER
"VC" INDICATES VOLUME CONTROL ON SPEAKER.

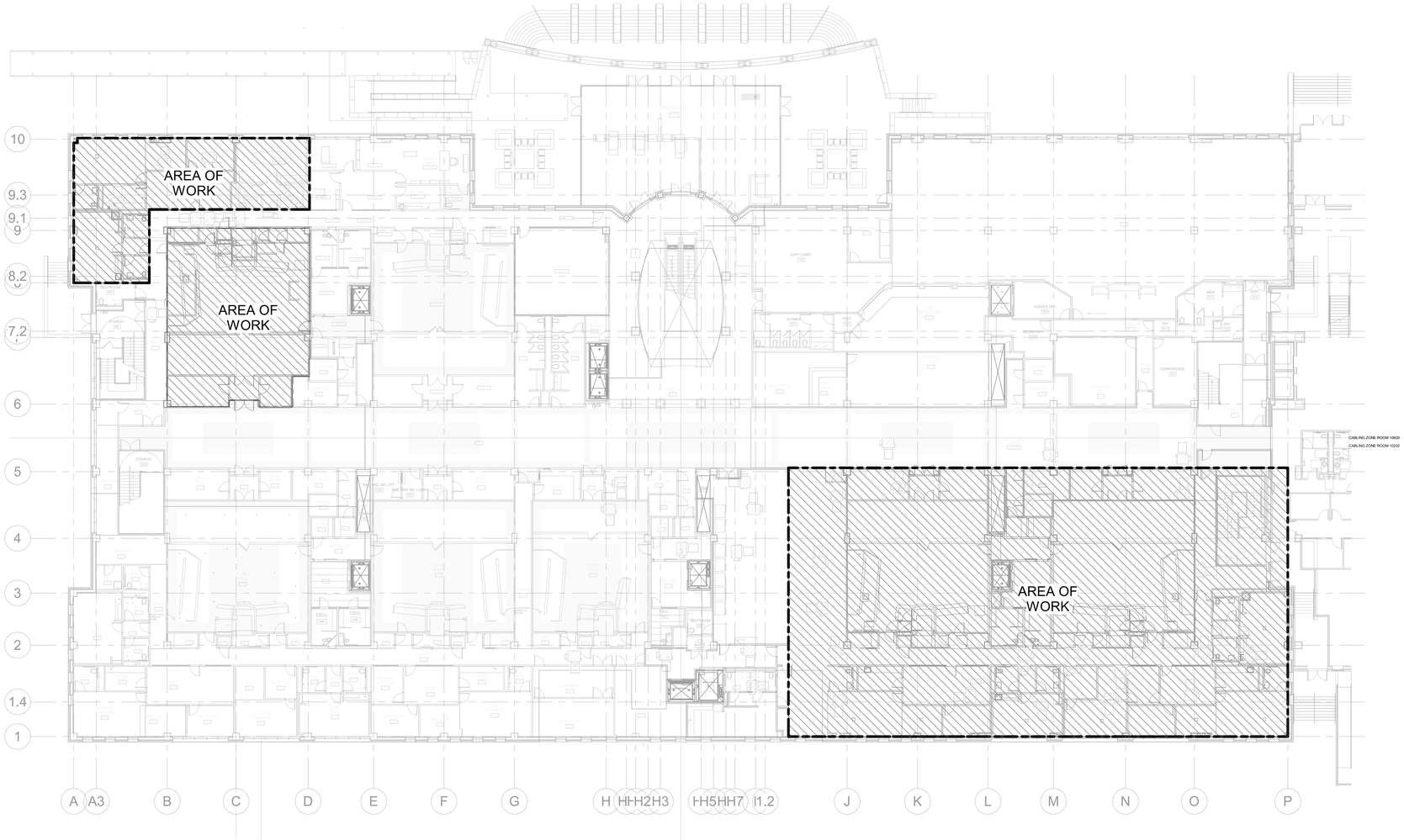
## TECHNOLOGY GENERAL NOTES

1. CONTRACTOR SHALL COORDINATING WITH DBR ENGINEERING PRIOR TO THE INSTALLATION OF RACKS AND RACK EQUIPMENT. NO RACKS SHALL BE PERMANENTLY INSTALLED WITHOUT WRITTEN APPROVAL OF THE PROPOSED LOCATIONS.
2. THE SELECTED, INSTALLING CONTRACTOR MUST BE A CERTIFIED INTEGRATOR/ INSTALLER AUTHORIZED BY THE SPECIFIED SYSTEM MANUFACTURER TO INSTALL THE CABLE PLANT AND CONNECTIVITY PRODUCTS. REFER TO SPECIFICATIONS FOR PRODUCT TYPE AND DESCRIPTION.
3. SYSTEM WIRING AND EQUIPMENT INSTALLATION SHALL BE IN ACCORDANCE WITH GOOD ENGINEERING PRACTICES AS ESTABLISHED BY ANSI/EIA/TIA, BICSI, AND THE NEC.
4. ALL WIRING SHALL MEET ALL STATE AND LOCAL ELECTRICAL CODES.
5. ALL TELECOMMUNICATIONS SYSTEMS EQUIPMENT AND MOUNTING LOCATIONS SHALL BE IN COMPLIANCE WITH ADA ACCESSIBILITY STANDARDS.
6. ALL INDUSTRY STANDARD CATEGORY 6 CABLING PRACTICES MUST BE FOLLOWED FOR ALL DATA CABLING.
7. ALL DATA CABLES ARE TO BE INSTALLED WITH A MINIMUM OF 12 INCHES OF SEPARATION FROM AC POWER CABLES, INTERCOM, FIRE ALARM, SECURITY CABLES IN ANY PARALLEL OPEN WIRE RUN.
8. ALWAYS CROSS OTHER SYSTEM CABLES AT A 90 DEGREE ANGLE.
9. ALL CABLES AND TERMINATION COMPONENTS SHALL BE MACHINE LABELED AT BOTH ENDS. LABEL ALL CABLES PER TS DRAWINGS AND/OR SPECIFICATIONS. FINAL CABLE/OUTLET IDENTIFICATION LABELS SHALL BE COORDINATED WITH THE OWNER AND DBR.
10. CONTRACTOR TO PROVIDE LIGHTNING PROTECTION ON ALL COMMUNICATION CABLE BETWEEN BUILDINGS.
11. ALL EXPOSED CABLING ROUTED IN PLENUM SHALL BE PLENUM-RATED. ALL NON PLENUM-RATED CABLING INSTALLED IN PLENUM SPACES SHALL BE INSTALLED IN CONDUIT.
12. NO TERMINATION OR SPLICES SHALL BE INSTALLED IN OR ABOVE CEILINGS UNLESS NOTED NOTED OTHERWISE.
13. CONTRACTOR SHALL MAINTAIN WALL RATING WITH PROPER FIRE BLOCKING.
14. ALL CABLE INSTALLED SHALL ROUTE TO THE CENTER OF THE ROOM IN WHICH IT SERVES AND THEN TO THE OUTLET LOCATION IT IS INTENDED FOR. EACH CABLE SHALL HAVE A 10' SERVICE LOOP AT THE CENTER OF EACH ROOM AND A 3' SERVICE LOOP ABOVE EACH OUTLET LOCATION.
15. THE SYSTEM INSTALLER SHALL PROPERLY SUPPORT ALL INSTALLED SYSTEM CABLING FROM A PANDUIT J-MOD CABLE SUPPORT SYSTEMS AS DETAILED IN SPECIFICATIONS. NO CABLING SHALL BE ROUTED AND TIED DIRECTLY TO BUILDING STEEL, CEILING GRID SUPPORT, CONDUIT, PIPING, OR DUCTWORK. PANDUIT J-MOD SUPPORT SYSTEM SHALL BE DIRECTLY CONNECTED TO THE BUILDING'S STEEL JOIST. IN LOCATION WHERE THE BOTTOM OF THE JOIST IS MORE THAN 5' ABOVE THE CEILING, THE SYSTEM INSTALLER SHALL PROVIDE AND INSTALL THREADED ROD AND ALL REQUIRED MATERIALS TO CONNECT THE THREADED ROD TO THE BUILDING STEEL AND THE CABLE SUPPORT SYSTEM TO THE THREADED ROD. CABLE PATHWAY SHALL NOT BE HIGHER THAN 5' ABOVE THE CEILING AT ANY LOCATIONS.
16. CONTRACTOR TO PROVIDE AND INSTALL ALL REQUIRED CABLING AND COMPONENTS TO FURNISH TWO (2) ANALOG TELEPHONE CABLES TO THE FIRE ALARM SYSTEM. CONTRACTOR TO COORDINATE WITH THE SYSTEM INSTALLER FOR EXACT LOCATIONS AND TERMINATION INSTRUCTIONS PRIOR TO INSTALLATION.
17. CONTRACTOR TO PROVIDE AND INSTALL (1) CATEGORY 6 CABLE TO THE BUILDING'S ACCESS CONTROL HEAD END PANEL. TERMINATION OF THIS CABLE SHALL BE COORDINATED WITH THE SYSTEM INSTALLER.
18. CONTRACTOR TO PROVIDE AND INSTALL (1) CATEGORY 6 CABLE TO THE BUILDING'S INTRUSION DETECTION PANEL. TERMINATION OF THIS CABLE SHALL BE COORDINATED WITH THE SYSTEM INSTALLER.
19. PROVIDE AND INSTALL ONE (1) CATEGORY 6 CABLE TO EACH LIGHTING CONTROL HUB ON THE ENTIRE PROJECT. COORDINATE EXACT QUANTITY AND LOCATIONS WITH THE LIGHTING CONTROL SYSTEM INSTALLER. CONTRACTOR TO ASSUME A MINIMUM OF FIVE (5) PER PROJECT.
20. CONTRACTOR TO PROVIDE AND INSTALL ONE (1) CATEGORY 6 DATA CIRCUITS TO EACH PROJECTOR AND LCD ON THE ENTIRE PROJECT.
21. PROVIDE AND INSTALL ONE (1) CATEGORY 6 DATA CIRCUIT TO THE LOCAL AIR UNIT CONTROLLER IN EACH MDF AND IDF.
22. PROVIDE AND INSTALL ONE (1) CATEGORY 6 DATA CIRCUIT TO EACH ACCESS CONTROL VIDEO DOOR STATION ON THE ENTIRE PROJECT. COORDINATE EXACT LOCATION AND TERMINATION REQUIREMENTS WITH THE DOOR STATION INSTALLER, PRIOR TO INSTALLATION. 22.

## SECURITY GENERAL NOTES

1. THE SECURITY SYSTEM INSTALLERS SHALL BE RESPONSIBLE FOR CONNECTING ALL APPLICABLE SYSTEM EQUIPMENT TO THE OWNER'S NETWORK.
2. HE SYSTEM INSTALLER SHALL PROPERLY SUPPORT ALL INSTALLED SYSTEM CABLING FROM AN APPROVED CABLE SUPPORT SYSTEM AS DETAILED IN SPECIFICATIONS. NO CABLING SHALL BE ROUTED AND TIED DIRECTLY TO BUILDING STEEL, CEILING GRID SUPPORT, CONDUIT, PIPING, OR DUCTWORK. THE CABLE SUPPORT SYSTEM SHALL BE DIRECTLY CONNECTED TO THE BUILDING'S STEEL JOIST. AT LOCATIONS WHERE THE BOTTOM OF THE JOIST IS MORE THAN 5' ABOVE THE CEILING, THE SYSTEM INSTALLER SHALL PROVIDE AND INSTALL THREADED ROD AND ALL REQUIRED MATERIALS TO CONNECT THE THREADED ROD TO THE BUILDING STEEL AND THE CABLE SUPPORT SYSTEM TO THE THREADED ROD. CABLE PATHWAY SHALL NOT BE HIGHER THAN 5' ABOVE THE CEILING AT ANY LOCATIONS.
3. ECURITY CAMERA SYSTEM INSTALLER SHALL PROVIDE A CEILING MOUNTED INSTALLATION KIT RECOMMENDED BY THE MANUFACTURER OF THE CAMERA. EACH CEILING MOUNTED CAMERA KIT SHALL HAVE A SUPPORT WIRE ATTACHED TO THE BUILDING'S STRUCTURE TO PREVENT THE CAMERA FROM DROPPING TO THE FLOOR AT ANY TIME. AT NO POINT SHALL THE WEIGHT OF THE CEILING MOUNTED SECURITY CAMERA BE SUPPORTED BY THE CEILING GRID SYS

☐ TECHNOLOGY KEYED NOTES




1 T2.10 **LEVEL 1 COMPOSITE TECHNOLOGY PLAN**
1/16" = 1'-0"


**CLIENT**

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**REGISTRATION**

STATE OF TEXAS
MIKE L. ASHCRAFT
56590
LICENSED
PROFESSIONAL ENGINEER
10/17/2024


**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 05/01/2024 | 100% DESIGN DEVELOPMENT |
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTUCTION DOCUMENTS |
| | 09/20/2024 | 100% CONSTRUCTION DOCUMENTS |

**KEY PLAN**

D

**PROJECT NAME**
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**
1007828.00

**SHEET TITLE**
LEVEL 1 COMPOSITE TECHNOLOGY PLAN

**SHEET NUMBER**
T2.10


DBR
9990 Richmond Avenue
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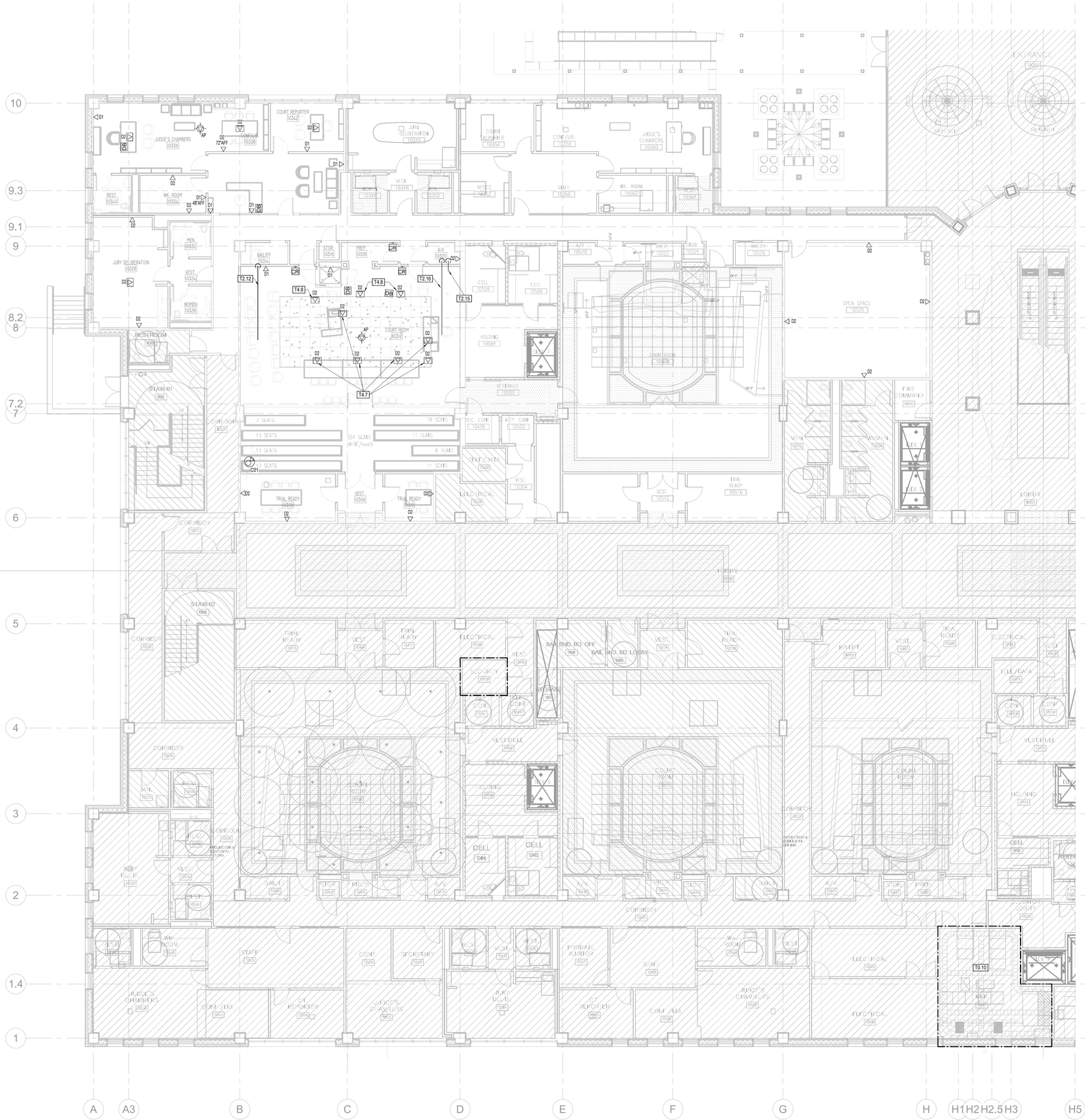
TBPE Firm Registration No. 2234


DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

TN PN




## TECHNOLOGY KEYED NOTES

T0.10 NEW STRUCTURED CABLING SHOWN ON THIS PAGE SHALL ORIGINATE IN THIS ROOM.

T2.12 PROVIDE TWO (2) 1-1/2 INCH CONDUIT STUBBED OUT IN ACCESSIBLE CEILING FOR DATA AND AV.

T2.15 PROVIDE TWO (2) 2" SLEEVES FROM AV RACK INTO COURTROOM.

T2.16 PROVIDE TWO (2) 2" CONDUITS FROM AV ROOM RAIN INTO RAISED FLOOR. COORDINATE FINAL TERMINATION WITH IT INSTALLER.

T4.7 FLOOR BOX TO HAVE (4) FOUR SINGLE GANG BOX (1) ONE FOR POWER, (1) ONE FOR DATA (2 PORT), (1) ONE FOR AV NETWORK AND (1) ONE FOR AV AUDIO. PATHWAYS TO ACCESSIBLE CEILING OR RAISED FLOOR.

T4.8 FLOOR BOX TO HAVE (3) THREE SINGLE GANG BOX (1) ONE FOR POWER, (1) ONE FOR AV, (1) FOR DATA. PATHWAYS TO ACCESSIBLE CEILING OR RAISED FLOOR.

## GENERAL FLOOR PLAN NOTES:

1. ALL TECHNOLOGY DEVICES, OUTLETS AND CABLE/CONDUIT PATHWAYS SHOWN ARE DIAGRAMMATIC ONLY AND ARE NOT MEANT TO SHOW THE EXACT LOCATION OR ROUTE. CONTRACTOR SHALL VERIFY WITH ARCHITECT AND OWNER FOR EXACT ROUTE, MOUNTING HEIGHT, AND LOCATION BEFORE INSTALLATION, AND SHALL COORDINATE WITH OTHER TRADES TO MAKE ANY FIELD ADJUSTMENTS AS NECESSARY TO AVOID COLLISIONS AND MEET THE PROJECT REQUIREMENTS.
2. CONDUITS AND BACKBOXES, SIZED PER DIV 27/28 SPECIFICATIONS, SHALL BE PROVIDED (BY DIV 26) FOR ALL TECHNOLOGY SYSTEM DEVICES MOUNTED ON WALL, FLOOR, AND OPEN OR SOLID FINISH CEILING. CONDUITS/SLEEVES SHALL BE PROVIDED FOR ALL CABLES ROUTED IN WALLS, OR THROUGH FULL HEIGHT PARTITIONS, OR THROUGH INACCESSIBLE CEILING PLENUM, OR THROUGH SPACES WITH EXPOSED CEILING DECK.
3. CABLES FOR DIFFERENT APPLICATIONS (DATA, AUDIO, VIDEO, SECURITY, ETC.) OR OF DIFFERENT MEDIA TYPE (COAX, UTP, ETC.) SHALL BE ROUTED IN SEPARATE PATHWAYS IN J-HOOKS, CONDUITS, SLEEVES, CORES, ETC. THROUGHOUT THE ENTIRE PATHWAY.
4. BUSHINGS SHALL BE INSTALLED AT EACH END OF THE CONDUITS BEFORE CABLES BEING PULLED THROUGH. PROVIDE PULL STRING IN EACH CONDUIT INSTALLED AND LEAVE ONE FOR FUTURE PULLING AFTER CABLE INSTALLATION IS COMPLETE.
5. NO NETWORK DATA CABLE RUN SHALL EXCEED 295 FEET IN TOTAL LENGTH INCLUDING UP/DOWN AND SERVICE LOOPS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT AND ENGINEER. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR PROPER PATHWAY PLANNING.
6. NEW DATA, SECURITY AND INTERCOM DROPS SHALL TIE INTO EXISING SYSTEMS AND HOMERUN BACK TO IT/SEC/MER ROOM 10044 THROUGH EXISTING PATHWAYS.

1 T2.11 **LEVEL 1 PARTIAL TECHNOLOGY PLAN A**
1/8" = 1'-0"

TN PN


DBR
9990 Richmond Avenue
South Building, Suite 300
Houston, Texas 77042
713.914.0888 p 713.914.0886 f
TBPE Firm Registration No. 2234


| DBR Project Number | 243028 | | | |
|---|---|---|---|---|
| RH | DR | RR | MR | AD |

**CLIENT**

THE STATE OF TEXAS FORT BEND COUNTY

**FORT BEND COUNTY**

301 JACKSON ST.
RICHMOND, TX 77469
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**ARCHITECT**

PGAL


PGAL, Inc.
3131 Briarpark Dr.
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**CONSULTANT**

**REGISTRATION**

STATE OF TEXAS
MIKE L. ASHCRAFT
56590
LICENSED
PROFESSIONAL ENGINEER
10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 05/01/2024 | 100% DESIGN DEVELOPMENT |
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTUCTION DOCUMENTS |
| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**KEY PLAN**

D

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

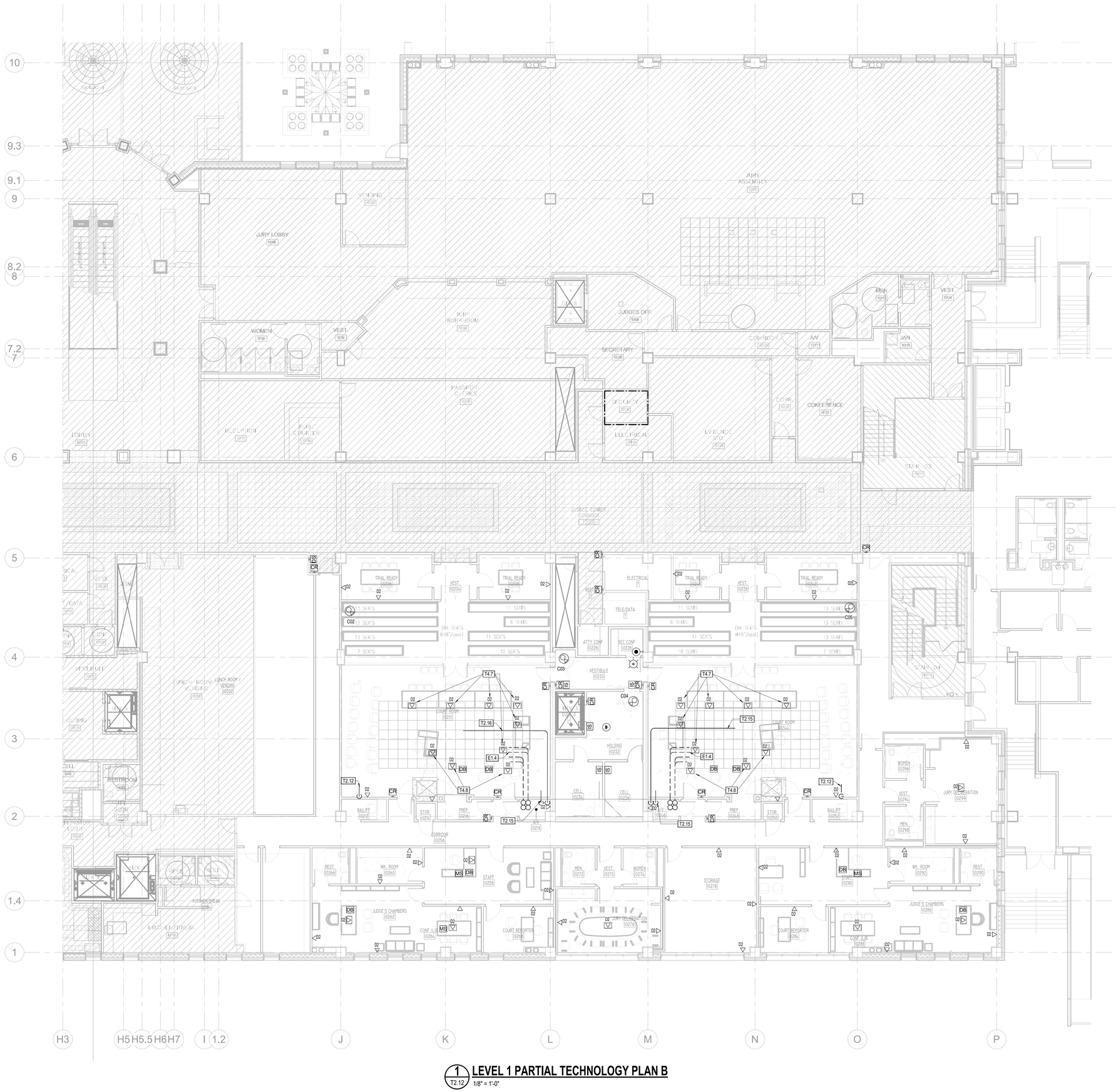
1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL TECHNOLOGY PLAN A

**SHEET NUMBER**

T2.11




## TECHNOLOGY KEYED NOTES

T2.12 PROVIDE TWO (2) 1-1/2 INCH CONDUIT STUBBED OUT IN ACCESSIBLE CEILING FOR DATA AND AV.

T2.15 PROVIDE TWO (2) 2" SLEEVES FROM AV RACK INTO COURTROOM.

T2.16 PROVIDE TWO (2) 2" CONDUITS FROM AV ROOM RAIN INTO RAISED FLOOR. COORDINATE FINAL TERMINATION WITH IT INSTALLER.

T4.7 FLOOR BOX TO HAVE (4) FOUR SINGLE GANG BOX (1) ONE FOR POWER, (1) ONE FOR DATA (2 PORT), (1) ONE FOR AV NETWORK AND (1) ONE FOR AV AUDIO. PATHWAYS TO ACCESSIBLE CEILING OR RAISED FLOOR.

T4.8 FLOOR BOX TO HAVE (3) THREE SINGLE GANG BOX (1) ONE FOR POWER, (1) ONE FOR AV, (1) FOR DATA. PATHWAYS TO ACCESSIBLE CEILING OR RAISED FLOOR.

## GENERAL FLOOR PLAN NOTES:

1. ALL TECHNOLOGY DEVICES, OUTLETS AND CABLE/CONDUIT PATHWAYS SHOWN ARE DIAGRAMMATIC ONLY AND ARE NOT MEANT TO SHOW THE EXACT LOCATION OR ROUTE. CONTRACTOR SHALL VERIFY WITH ARCHITECT AND OWNER FOR EXACT ROUTE, MOUNTING HEIGHT, AND LOCATION BEFORE INSTALLATION, AND SHALL COORDINATE WITH OTHER TRADES TO MAKE ANY FIELD ADJUSTMENTS AS NECESSARY TO AVOID COLLISIONS AND MEET THE PROJECT REQUIREMENTS.
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3. CABLES FOR DIFFERENT APPLICATIONS (DATA, AUDIO, VIDEO, SECURITY, ETC.) OR OF DIFFERENT MEDIA TYPE (COAX, UTP, ETC.) SHALL BE ROUTED IN SEPARATE PATHWAYS IN J-HOOKS, CONDUITS, SLEEVES, CORES, ETC. THROUGHOUT THE ENTIRE PATHWAY.
4. BUSHINGS SHALL BE INSTALLED AT EACH END OF THE CONDUITS BEFORE CABLES BEING PULLED THROUGH. PROVIDE PULL STRING IN EACH CONDUIT INSTALLED AND LEAVE ONE FOR FUTURE PULLING AFTER CABLE INSTALLATION IS COMPLETE.
5. NO NETWORK DATA CABLE RUN SHALL EXCEED 295 FEET IN TOTAL LENGTH INCLUDING UP/DOWN AND SERVICE LOOPS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT AND ENGINEER. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR PROPER PATHWAY PLANNING.
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1 T2.12 **LEVEL 1 PARTIAL TECHNOLOGY PLAN B**
1/8" = 1'-0"

TN PN


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DBR Project Number 243028

| RH | DR | RR | MR | AD |
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**CLIENT**

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STATE OF TEXAS
MIKE L. ASHCRAFT
56590
LICENSED
PROFESSIONAL ENGINEER
10/17/2024

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| | 10/17/2024 | ISSUE FOR PERMIT & BID |

**KEY PLAN**

D

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX
77469

**PROJECT NUMBER**

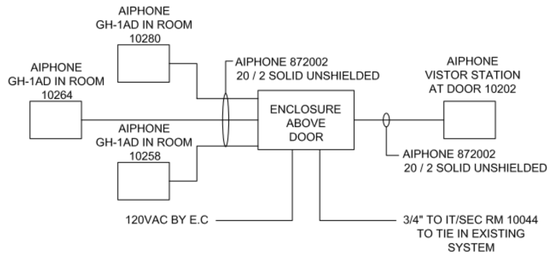
1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL TECHNOLOGY PLAN B

**SHEET NUMBER**

T2.12




## AIPHONE INTERCOM SYSTEM RISER DIAGRAM

## SECURITY CAMERA SYSTEM RISER DIAGRAM

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9090 Richmond Avenue
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TBPE Firm Registration No. 2234

| | |
|---|---|
| DBR Project Number | 243028 |

| | | | | |
|---|---|---|---|---|
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RICHMOND, TX 77469

**PROJECT NUMBER**

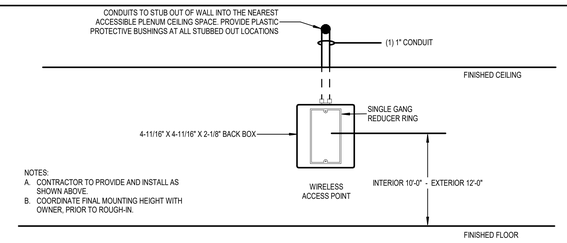
1007828.00

**SHEET TITLE**

TECHNOLOGY RISER DIAGRAMS

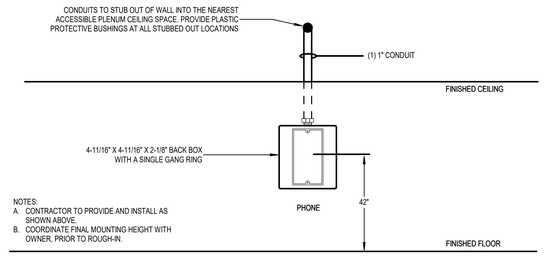
**SHEET NUMBER**

T4.01

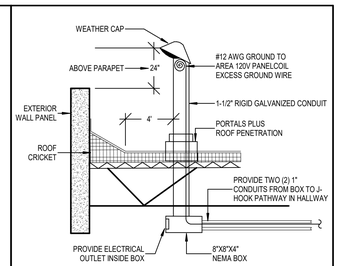



(TYPICAL LAYOUT FOR WALL MOUNTED WIRELESS ACCESS POINT)

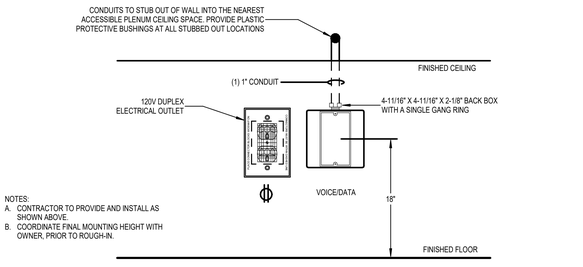
**8 RACEWAY DETAIL - WALL MOUNTED WIRELESS AP**
NOT TO SCALE



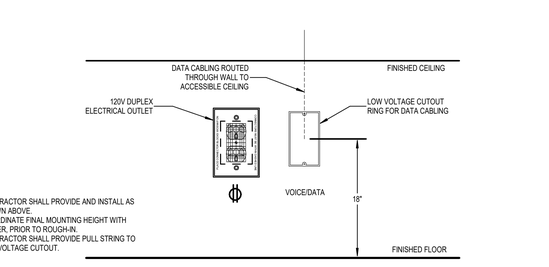

**9 RACEWAY DETAIL - WALL MOUNTED TELEPHONE**
NOT TO SCALE



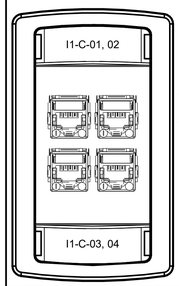

**10 LOW VOLTAGE - TYPICAL ROOF PENETRATION**
NOT TO SCALE




**4 RACEWAY DETAIL - TYPICAL VOICE/DATA OUTLET**
NOT TO SCALE

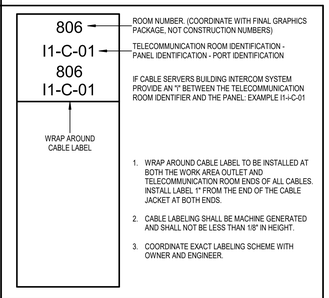



**5 TYPICAL VOICE/DATA OUTLET - RING AND STRING**
NOT TO SCALE



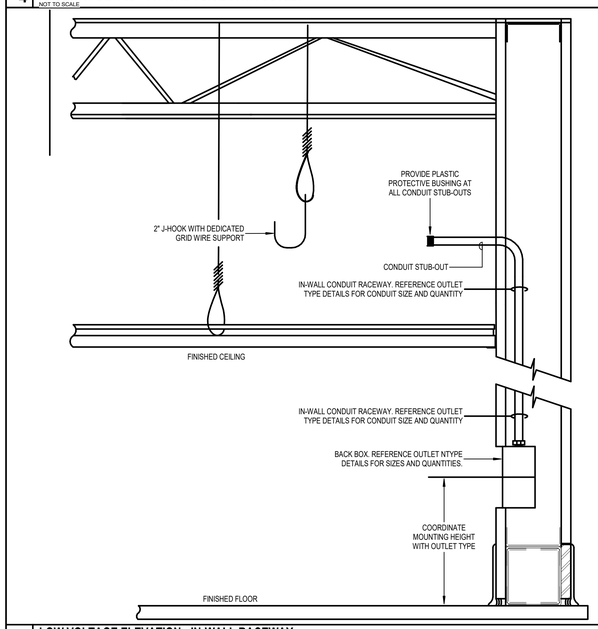

1. FACEPLATE LABELING SHALL BE MACHINE GENERATED AND SHALL NOT BE LESS THEN 1/4" IN HEIGHT.
2. PROVIDE BLANK INSERTS FOR ANY UNUSED PORTS.
3. COORDINATE EXACT LABELING SCHEME WITH OWNER AND ENGINEER.

**6 FACEPLATE LABEL DETAIL**
NOT TO SCALE

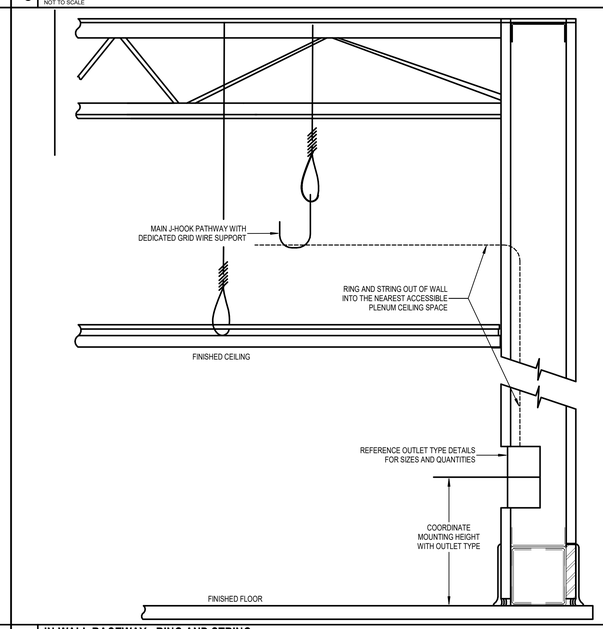



1. WRAP AROUND CABLE LABEL TO BE INSTALLED AT BOTH THE WORK AREA OUTLET AND TELECOMMUNICATION ROOM ENDS OF ALL CABLES. INSTALL LABEL 1" FROM THE END OF THE CABLE JACKET AT BOTH ENDS.
2. CABLE LABELING SHALL BE MACHINE GENERATED AND SHALL NOT BE LESS THAN 1/8" IN HEIGHT.
3. COORDINATE EXACT LABELING SCHEME WITH OWNER AND ENGINEER.

**7 CABLE LABEL DETAIL**
NOT TO SCALE




**1 LOW VOLTAGE ELEVATION - IN-WALL RACEWAY**
NOT TO SCALE




**2 IN-WALL RACEWAY - RING AND STRING**
NOT TO SCALE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TBPE Firm Registration No. 2234


DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

**CLIENT**

FORT BEND COUNTY

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**ARCHITECT**

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**CONSULTANT**

**REGISTRATION**

STATE OF TEXAS
MIKE L. ASHCRAFT
56590
LICENSED PROFESSIONAL ENGINEER
10/17/2024

**DRAWING HISTORY**

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| | 09/20/2024 | 100% CONSTRUCTION DOCUMENTS |

**KEY PLAN**

D

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

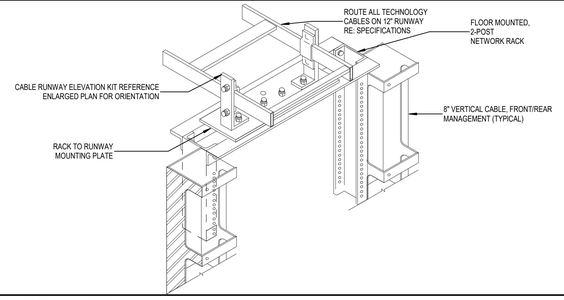
1007828.00

**SHEET TITLE**

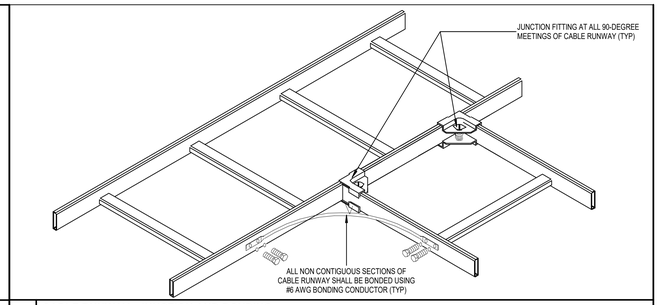
TECHNOLOGY DETAILS

**SHEET NUMBER**

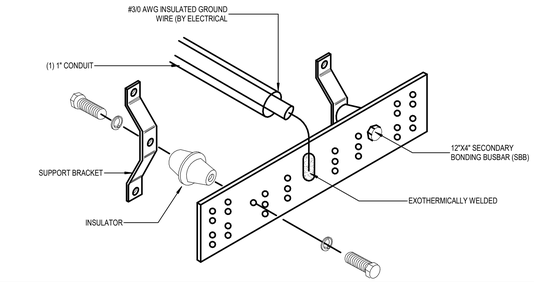
T6.01



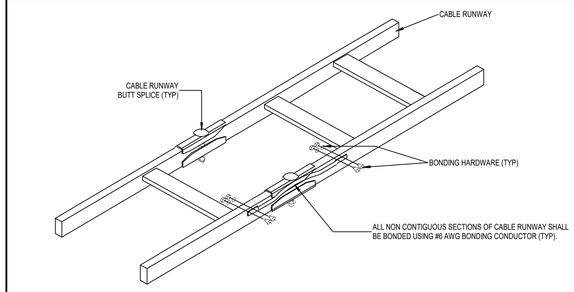

**5 RACK TO RUNWAY DETAIL**
NOT TO SCALE



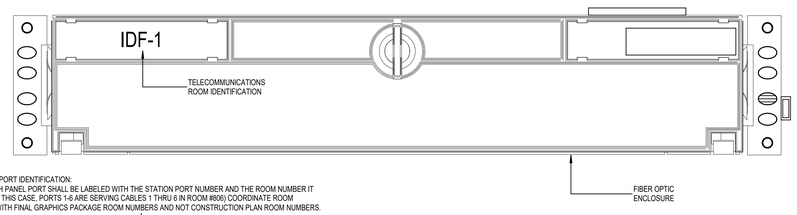

**6 CABLE RUNWAY - JUNCTION AND BONDING**
NOT TO SCALE




**3 LOW VOLTAGE - GROUNDING BUS DETAIL**
NOT TO SCALE

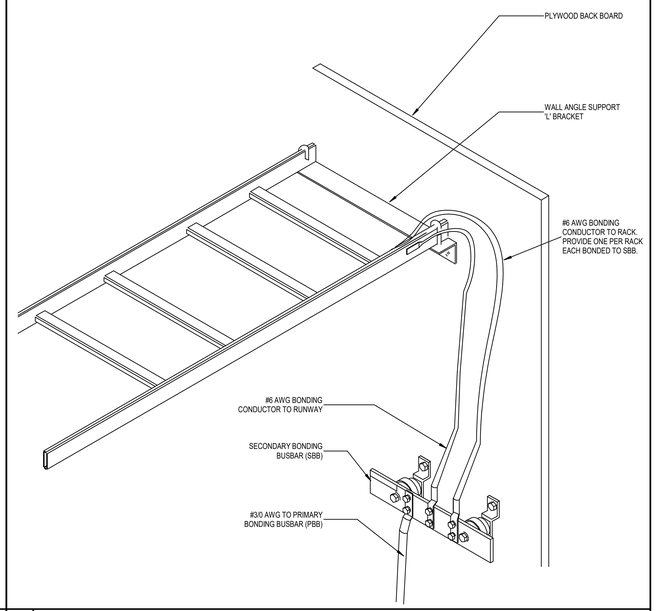



**4 CABLE RUNWAY - BONDING AND BUTT SPLICE**
NOT TO SCALE




1. PATCH PANEL PORT LABELING SHALL BE GENERATED AND SHALL NOT BE LESS THEN 1/4" IN HEIGHT.
2. PATCH PANEL AND TELECOMMUNICATIONS ROOM IDENTIFICATION LABEL SHALL BE MACHINE GENERATED AND SHALL NOT BE LESS THEN 1/8" HEIGHT.
3. COORDINATE EXACT LABELING SCHEME WITH OWNER AND ENGINEER.

**1 FIBER ENCLOSURE/ COPPER PATCH PANEL LABELING**
NOT TO SCALE




**2 CABLE RUNWAY - GROUNDING AND BONDING**
NOT TO SCALE


**CLIENT**

FORT BEND COUNTY

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**KEY PLAN**

D

**PROJECT NAME**
FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**
1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

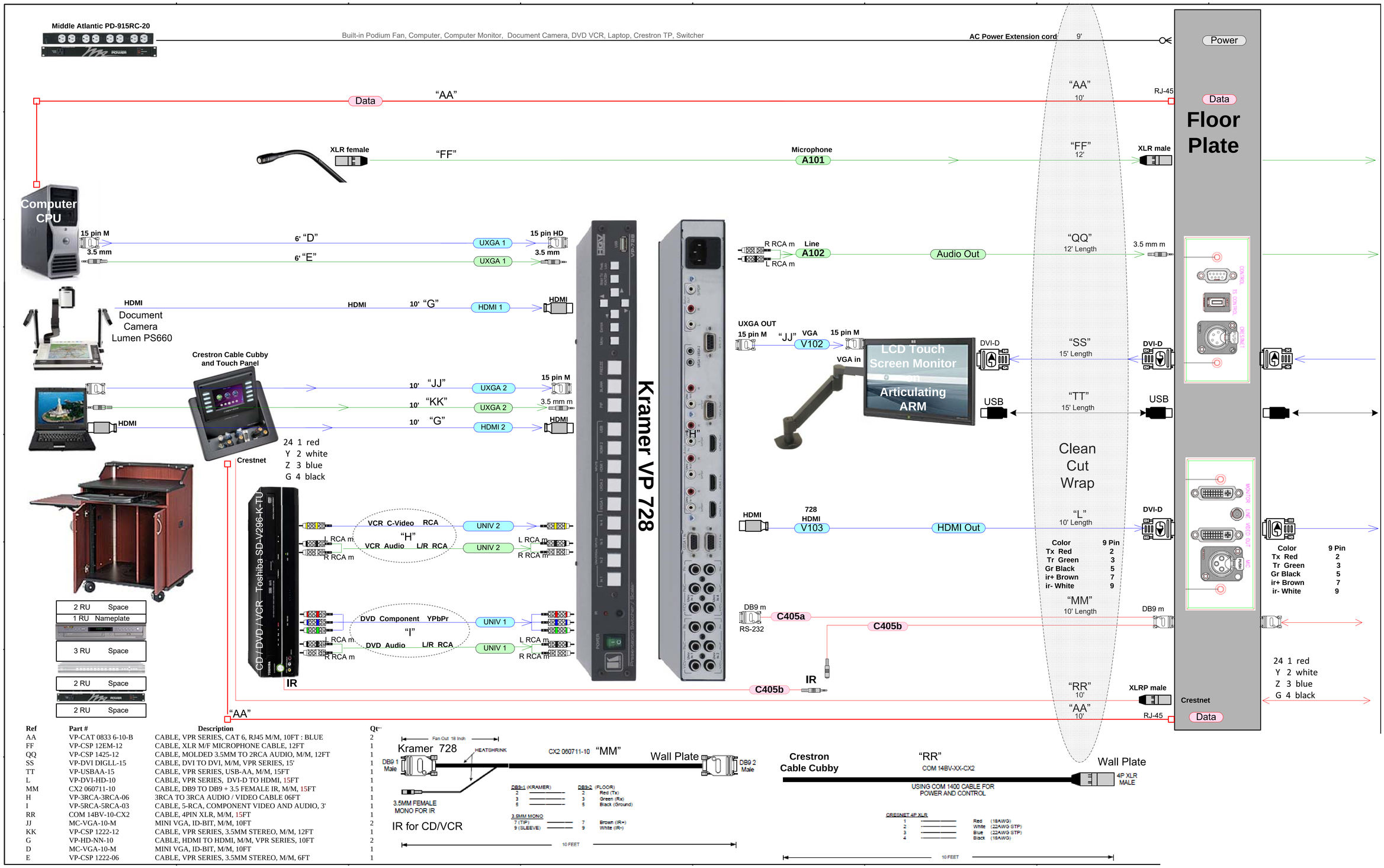
**PROJECT NUMBER**
1007828.00

**SHEET TITLE**
TECHNOLOGY DETAILS

DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

**SHEET NUMBER**
T6.02




| Ref | Part # | Description | Qty |
|---|---|---|---|
| AA | VP-CAT 0833 6-10-B | CABLE, VPR SERIES, CAT 6, RJ45 M/M, 10FT : BLUE | 2 |
| FF | VP-CSP 12EM-12 | CABLE, XLR M/F MICROPHONE CABLE, 12FT | 1 |
| QQ | VP-CSP 1425-12 | CABLE, MOLDED 3.5MM TO 2RCA AUDIO, M/M, 12FT | 1 |
| SS | VP-DVI DIGLL-15 | CABLE, DVI TO DVI, M/M, VPR SERIES, 15' | 1 |
| TT | VP-USBAA-15 | CABLE, VPR SERIES, USB-AA, M/M, 15FT | 1 |
| L | VP-DVI-HD-10 | CABLE, VPR SERIES, DVI-D TO HDMI, 15FT | 1 |
| MM | CX2 060711-10 | CABLE, DB9 TO DB9 + 3.5 FEMALE IR, M/M, 15FT | 1 |
| H | VP-3RCA-3RCA-06 | 3RCA TO 3RCA AUDIO / VIDEO CABLE 06FT | 1 |
| I | VP-5RCA-5RCA-03 | CABLE, 5-RCA, COMPONENT VIDEO AND AUDIO, 3' | 1 |
| RR | COM 14BV-10-CX2 | CABLE, 4PIN XLR, M/M, 15FT | 1 |
| JJ | MC-VGA-10-M | MINI VGA, ID-BIT, M/M, 10FT | 2 |
| KK | VP-CSP 1222-12 | CABLE, VPR SERIES, 3.5MM STEREO, M/M, 12FT | 1 |
| G | VP-HD-NN-10 | CABLE, HDMI TO HDMI, M/M, VPR SERIES, 10FT | 2 |
| D | MC-VGA-10-M | MINI VGA, ID-BIT, M/M, 10FT | 1 |
| E | VP-CSP 1222-06 | CABLE, VPR SERIES, 3.5MM STEREO, M/M, 6FT | 1 |







CLIENT

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10/17/2024

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PROJECT NUMBER

1007828.00

SHEET TITLE

AV DETAILS

SHEET NUMBER

T6.03

DBR

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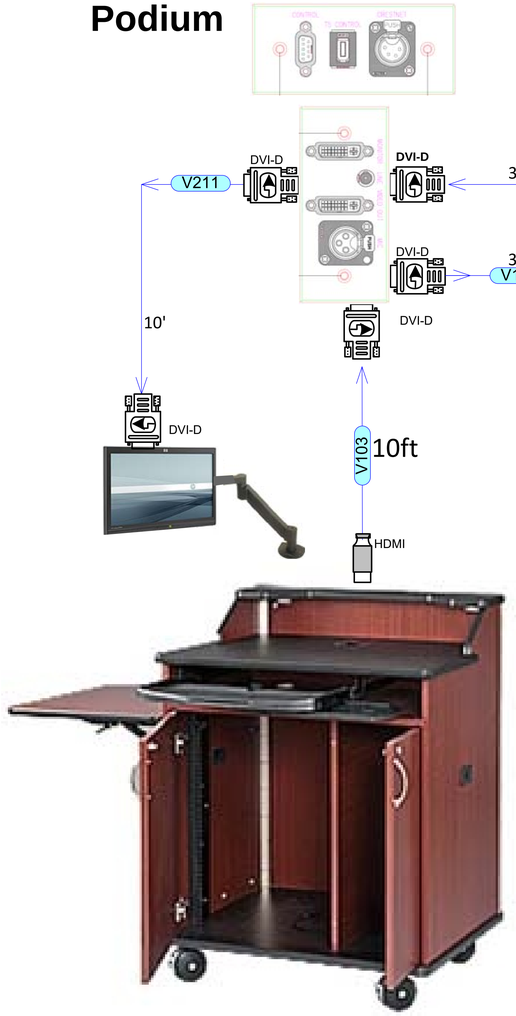
# Podium

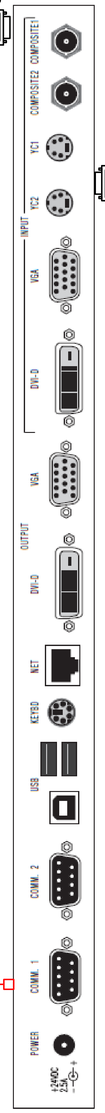




DVI-D
V211
DVI-D
35'
DVI-D
35'
V104
DVI-D
10'
DVI-D
V103
10ft
HDMI

# Equipment Rack

HDMI
DVI-D




Data

DVI-D
6'
DVI-D
V105

# Displays

DVI-D
HDMI
V201
Podium
on Articulating Arm
39'

DVI-D
HDMI
V202
50'
6'
HDMI
HDMI Extender
HDMI
6'
V212
DVI-D
Judge

DVI-D
HDMI
V203
50'
6'
HDMI
HDMI Extender
HDMI
6'
V213
DVI-D
Prosecution

DVI-D
HDMI
V204
50'
6'
HDMI Extender
6'
V214
DVI-D
Defense

DVI-D
HDMI
V205
50'
6'
HDMI Extender
HDMI
6'
V215
DVI-D
Witness

DVI-D
V206
Projector
in ceiling
75'
Reclocker
DVI-D
Vivitec 6010

Note: The projector must be on output 1 for EDID reference

The standard zoom lens on the 6010 is a 1.8- 2.38.

The closest is 1.8 x 96 = 172.8" or 14.4'

The furthest is 2.38 x 96 = 228.48" or 19.04'


CLIENT

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301 JACKSON ST.
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CONSULTANT

REGISTRATION

MIKE L. ASHCRAFT
56590
LICENSED PROFESSIONAL ENGINEER
10/17/2024


DRAWING HISTORY

| № | DATE | DESCRIPTION |
|---|---|---|
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTUCTION DOCUMENTS |
| | 09/20/2024 | 100% CONSTRUCTION DOCUMENTS |

KEY PLAN

D

PROJECT NAME

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

PROJECT LOCATION

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

PROJECT NUMBER

1007828.00

SHEET TITLE

AV DETAILS


DBR
9990 Richmond Avenue
South Building, Suite 300
Houston, Texas 77042
713.914.0888 p 713.914.0886 f
TBPE Firm Registration No. 2234


DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

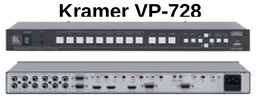
SHEET NUMBER

T6.04

# Equipment Rack

## Podium

Kramer VP-728



XLR — Pin 1 Ground, Pin 2 Red +, Pin 3 Black - → **Podium** → Microphone **A101** → Ground, + Red, - Black — 1

**Podium** → Line **A102** → 600 ohm resistors → + Red, - Black, Ground — 2

**Behind Wall Plate**

Foreign Language Translation Feed → **Location TBA** → Microphone **A103** → Ground, + Red, - Black — 3

Pin 1 Ground, Pin 2 Red +, Pin 3 Black - → **Wireless Microphone** → Microphone **A104** → Ground, + Red, - Black — 4

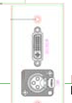
XLR

Pin 1 Ground, Pin 2 Red +, Pin 3 Black - → **Judge** → Microphone **A105** → Ground, + Red, - Black — 5

XLR

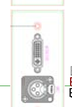
Pin 1 Ground, Pin 2 Red +, Pin 3 Black - → **Judge Sidebar Boundary** → Microphone **A106** → Ground, + Red, - Black — 6

XLR

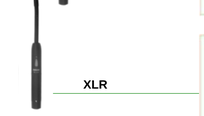


Pin 1 Ground, Pin 2 Red +, Pin 3 Black - → **Prosecution** → Microphone **A107** → Ground, + Red, - Black — 7

XLR



Pin 1 Ground, Pin 2 Red +, Pin 3 Black - → **Defense** → Microphone **A108** → Ground, + Red, - Black — 8

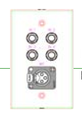


XLR

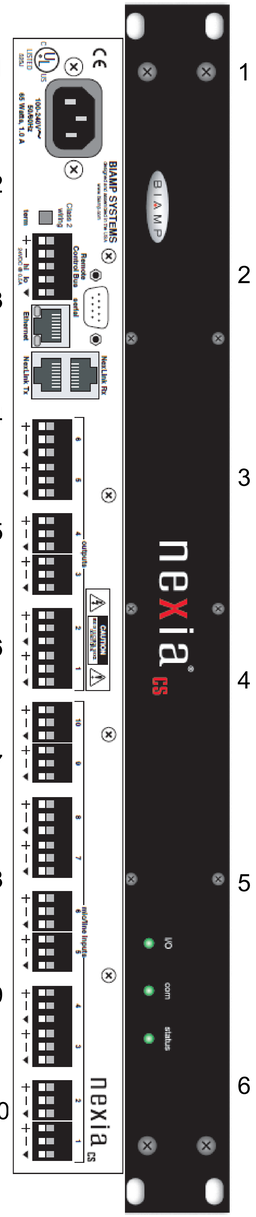
Pin 1 Ground, Pin 2 Red +, Pin 3 Black - → **Witness** → Microphone **A109** → Ground, + Red, - Black — 9



XLR



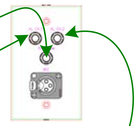
Pin 1 Ground, Pin 2 Red +, Pin 3 Black - → **Court Reporter** → Microphone **A110** → Ground, + Red, - Black — 10




1 → **A211** — Combined Audio feed → QSC ISA 300Ti

- S1 — Parameter 8 — Front
- S2 — Center 4

**A221** — Translation Headset



**A222** — Assisted Listening Channel 1

2 → **A212** — Foreign Language Translation Feed Channel 2

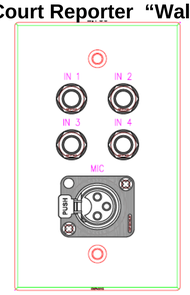
3 → **A213** — Court Reporters Feed — Judge & Court Reporter → **In 1**

4 → **A214** — Court Reporters Feed — Podium, 902 & Boundary Mic → **In 2**

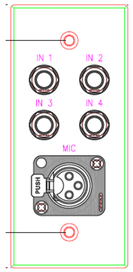
5 → **A215** — Court Reporters Feed — Prosecution & Defense → **In 3**

6 → **A216** — Court Reporters Feed — Witness → **In 4**

**Court Reporter "Wall"**




**Court Reporter "Floor"**



CLIENT

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CONSULTANT

REGISTRATION

STATE OF TEXAS — MIKE L. ASHCRAFT — 56590 — LICENSED PROFESSIONAL ENGINEER — 10/17/2024

DRAWING HISTORY

| № | DATE | DESCRIPTION |
|---|---|---|
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
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KEY PLAN

D

PROJECT NAME

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

PROJECT LOCATION

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

PROJECT NUMBER

1007828.00

SHEET TITLE

AV DETAILS

SHEET NUMBER

T6.05

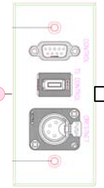
DBR
9090 Richmond Avenue
South Building, Suite 300
Houston, Texas 77042
713.914.0888 p 713.914.0886 f
TBPE Firm Registration No. 2234

DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

## Podium

USB — 10' — C401a



40' — C401 — USB

Crestnet

RS-232 — C405a

| KRAMER | Color | 9 Pin Floor |
|---|---|---|
| 2 | Tx Red | 2 |
| 3 | Tr Green | 3 |
| 5 | Gr Black | 5 |

| Toshiba | Color | 9 Pin Floor |
|---|---|---|
| 7 | ir+ Brown | 7 |
| 9 | ir- White | 9 |

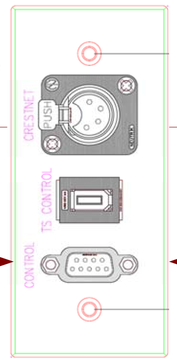
IR Sensor — C405b

## Judges Bench

Video and Audio Mute Mushroom — C402a

Crestnet — C403b

24 1 red
Y 2 white
Z 3 blue
G 4 black




24 1 red
Y 2 white
Z 3 blue
G 4 black — C403d

C403a — C403c

## Equipment Rack

USB — C406

Crestron IR-B — C414

D411 — Data

L:ogic input 1 and ground — C402

24 1 red
Y 2 white
Z 3 blue
G 4 black



Crestnet — C403

RS-232 - B — C404a

| KRAMER | Color | 9 Pin |
|---|---|---|
| 2 Tx | Red | 3 |
| 3 Tr | Grn | 2 |
| 5 Gr | Blk | 5 |

IR-A — C405b

| Toshiba | Color | 9 Pin |
|---|---|---|
| 7 | ir+ Brown | 7 |
| 9 | ir- White | 9 |

Relay A
Relay B
Down
Up
Red / Shield
Black/Shield
C407

RS-232-A — C408

2 – 2 Red
3 – 3 Black
5 – 5 Shield

C414 — IR-B one way RS-232 — PointMaker

IP: xxx.xxx.xxx.xxx
D412

## Displays

Data

USB — C406

Witness Stand — 10' — C406a — USB

on Articulating Arm mounted thru slate

Screen

IP: xxx.xxx.xxx.xxx
Data — D413

D413 — Data

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1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

PROJECT NUMBER

1007828.00

SHEET TITLE

AV DETAILS

SHEET NUMBER

T6.06

DBR
9990 Richmond Avenue
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Houston, Texas 77042
713.914.0888 p 713.914.0886 f
TBPE Firm Registration No. 2234

DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

## Judges Bench

Video and
Audio Mute
Mushroom

## Equipment Rack

## Podium

DBR
9990 Richmond Avenue
South Building, Suite 300
Houston, Texas 77042
713.914.0888 p 713.914.0886 f
TBPE Firm Registration No. 2234


| DBR Project Number | 243028 |
|---|---|

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

CLIENT

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STATE OF TEXAS
MIKE L. ASHCRAFT
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LICENSED
PROFESSIONAL ENGINEER
10/17/2024

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FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

PROJECT LOCATION

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

PROJECT NUMBER

1007828.00

SHEET TITLE

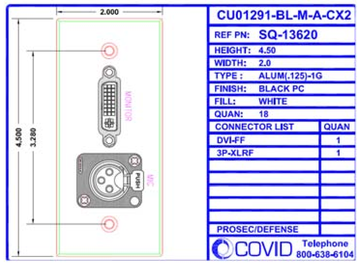
AV DETAILS

SHEET NUMBER

T6.07

# Typical Courtroom Floor and Wall Plates

### Prosecution & Defense Floor Plates (34)

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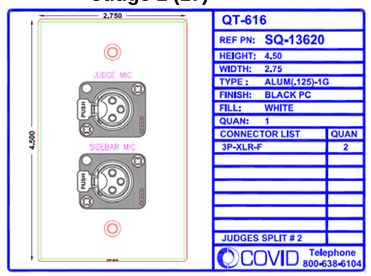
| WIDTH: 2.0 | |
| TYPE : ALUM.(.125)-1G | |
| FINISH: BLACK PC | |
| FILL: WHITE | |
| QUAN: 18 | |
| CONNECTOR LIST | QUAN |
| DVI-FF | 1 |
| 3P-XLRF | 1 |
| PROSEC/DEFENSE | |

COVID Telephone 800-638-6104

### Judge 1 (17)




| QT-616 | |
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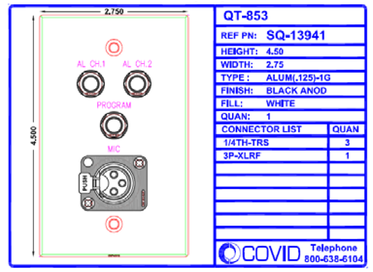
| TYPE : ALUM.(.125)-1G | |
| FINISH: BLACK PC | |
| FILL: WHITE | |
| QUAN: 1 | |
| CONNECTOR LIST | QUAN |
| 3P-XLR-F | 2 |
| JUDGES SPLIT # 2 | |

COVID Telephone 800-638-6104

### Court Clerk (17)




| QT-853 | |
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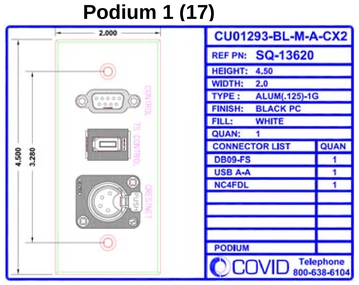
| FILL: WHITE | |
| QUAN: 1 | |
| CONNECTOR LIST | QUAN |
| 1/4TH-TRS | 3 |
| 3P-XLRF | 1 |

COVID Telephone 800-638-6104

### Podium 1 (17)

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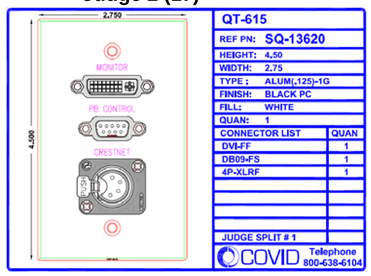
| QUAN: 1 | |
| CONNECTOR LIST | QUAN |
| DB09-FS | 1 |
| USB A-A | 1 |
| NC4FDL | 1 |
| PODIUM | |

COVID Telephone 800-638-6104

### Judge 2 (17)

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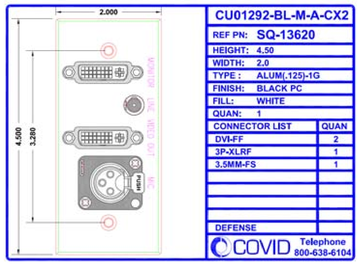
| QUAN: 1 | |
| CONNECTOR LIST | QUAN |
| DVI-FF | 1 |
| DB09-FS | 1 |
| 4P-XLRF | 1 |
| JUDGE SPLIT # 1 | |

COVID Telephone 800-638-6104

### Podium 2 (17)

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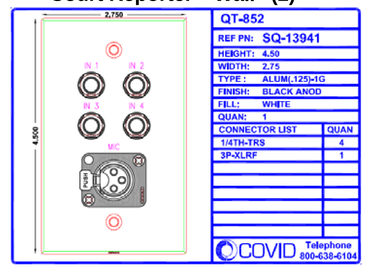
| FILL: WHITE | |
| QUAN: 1 | |
| CONNECTOR LIST | QUAN |
| DVI-FF | 2 |
| 3P-XLRF | 1 |
| 3.5MM-FS | 1 |
| DEFENSE | |

COVID Telephone 800-638-6104

### Court Reporter "Wall" (2)




| QT-852 | |
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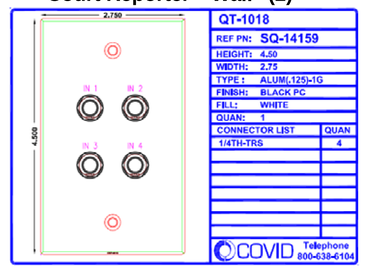
| FILL: WHITE | |
| QUAN: 1 | |
| CONNECTOR LIST | QUAN |
| 1/4TH-TRS | 4 |
| 3P-XLRF | 1 |

COVID Telephone 800-638-6104

### Court Reporter "Wall" (2)




| QT-1018 | |
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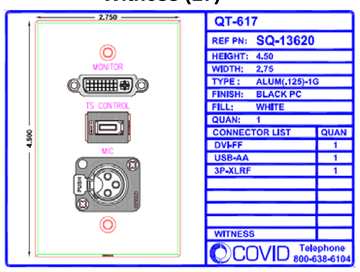
| QUAN: 1 | |
| CONNECTOR LIST | QUAN |
| 1/4TH-TRS | 4 |

COVID Telephone 800-638-6104

### Witness (17)




| QT-617 | |
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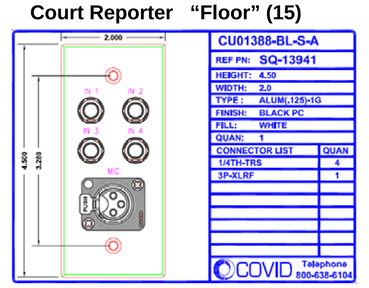
| QUAN: 1 | |
| CONNECTOR LIST | QUAN |
| DVI-FF | 1 |
| USB-AA | 1 |
| 3P-XLRF | 1 |
| WITNESS | |

COVID Telephone 800-638-6104

### Court Reporter "Floor" (15)




| CU01388-BL-S-A | |
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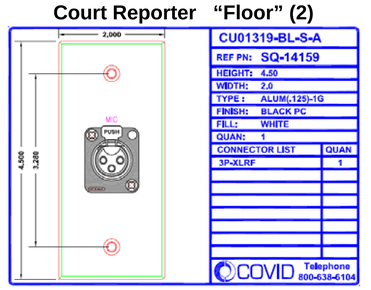
| FILL: WHITE | |
| QUAN: 1 | |
| CONNECTOR LIST | QUAN |
| 1/4TH-TRS | 4 |
| 3P-XLRF | 1 |

COVID Telephone 800-638-6104

### Court Reporter "Floor" (2)

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| TYPE : ALUM.(.125)-1G | |
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| FILL: WHITE | |
| QUAN: 1 | |
| CONNECTOR LIST | QUAN |
| 3P-XLRF | 1 |

COVID Telephone 800-638-6104

**CLIENT**

FORT BEND COUNTY

301 JACKSON ST.
RICHMOND, TX 77469
T 281-342-3411

**ARCHITECT**

PGAL, Inc.
3131 Briarpark Dr.
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**CONSULTANT**

DBR
9990 Richmond Avenue
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TBPE Firm Registration No. 2234


**REGISTRATION**

STATE OF TEXAS
MIKE L. ASHCRAFT
56590
LICENSED PROFESSIONAL ENGINEER
10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTUCTION DOCUMENTS |
| | 09/20/2024 | 100% CONSTRUCTION DOCUMENTS |

**KEY PLAN**

D

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

1007828.00

**SHEET TITLE**

AV DETAILS

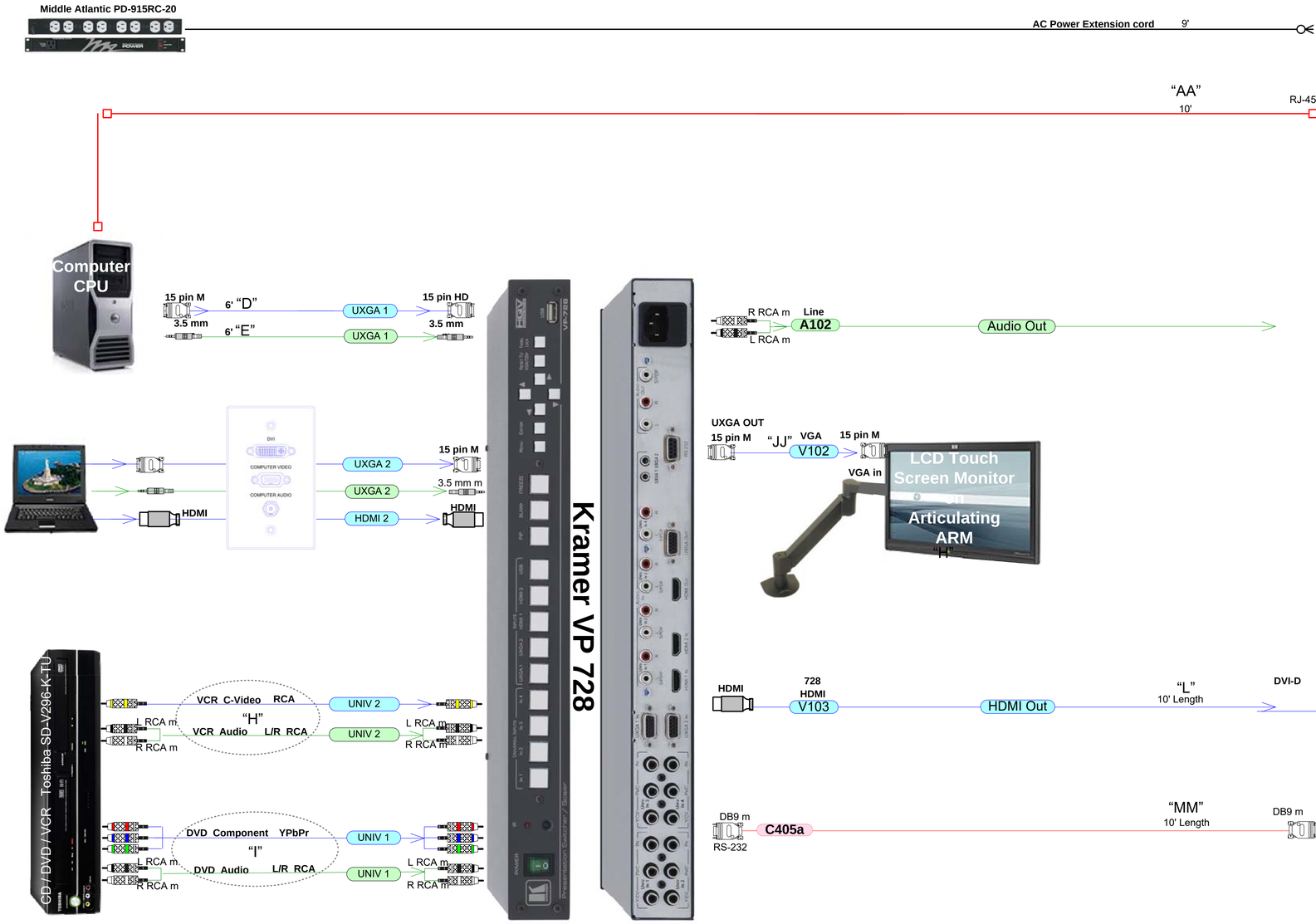
DBR Project Number 243028

| RH | DR | RR | MR | AD |
|---|---|---|---|---|

**SHEET NUMBER**

T6.08

# Equipment Rack




# Displays

## Projector

in ceiling

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PROJECT LOCATION

1422 EUGENE HEIMANN CIRCLE
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PROJECT NUMBER

1007828.00

SHEET TITLE

AV DETAILS

SHEET NUMBER

T6.09

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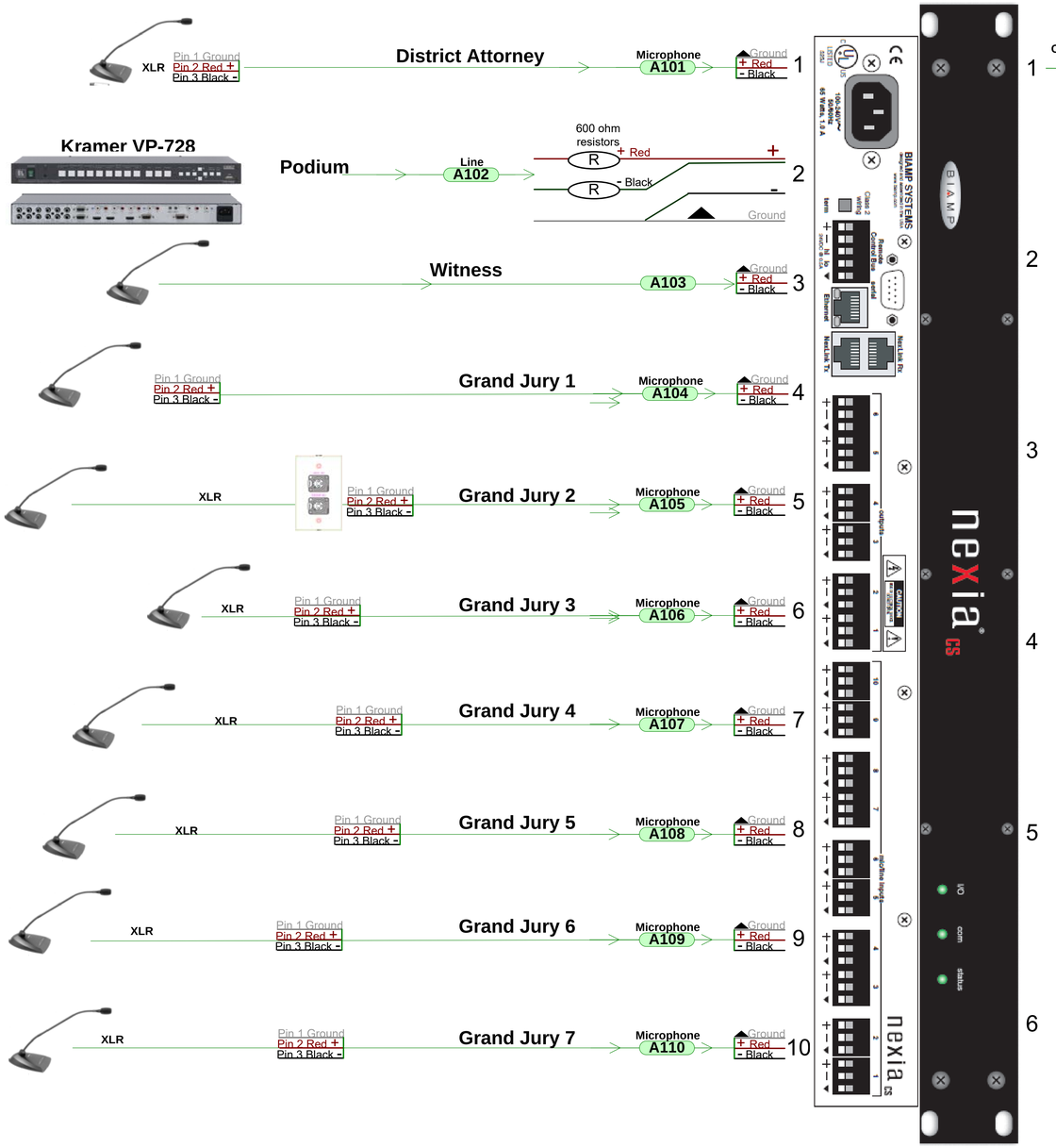



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SHEET TITLE

AV DETAILS

SHEET NUMBER

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DBR Project Number 243028

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|---|---|---|---|---|

## Wall

Crestnet

24 1 red
Y 2 white
Z 3 blue
G 4 black

C403c

RS-232

C405a

KRAMER Color 9 Pin Floor
2 Tx Red 2
3 Tr Green 3
5 Gr Black 5

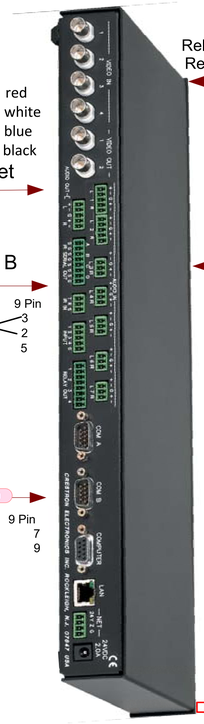
Toshiba Color 9 Pin Floor
7 ir+ Brown 7
9 ir- White 9

IR Sensor

C405b

Toshiba Color 9 Pin
7 ir+ Brown 7
9 ir- White 9

## Equipment Rack



24 1 red
Y 2 white
Z 3 blue
G 4 black

Crestnet

C403

RS-232 - B

C404a

KRAMER Color 9 Pin
2 Tx Red 3
3 Tr Grn 2
5 Gr Blk 5

IR-A

C405b

Relay A Down Red / Shield
Relay B Up Black/Shield

C407

RS-232-A

C408

2 – 2 Red
3 – 3 Black
5 – 5 Shield

IP: xxx.xxx.xxx.xxx

D412

## Displays

Screen

IP: xxx.xxx.xxx.xxx

Data D413

D413 Data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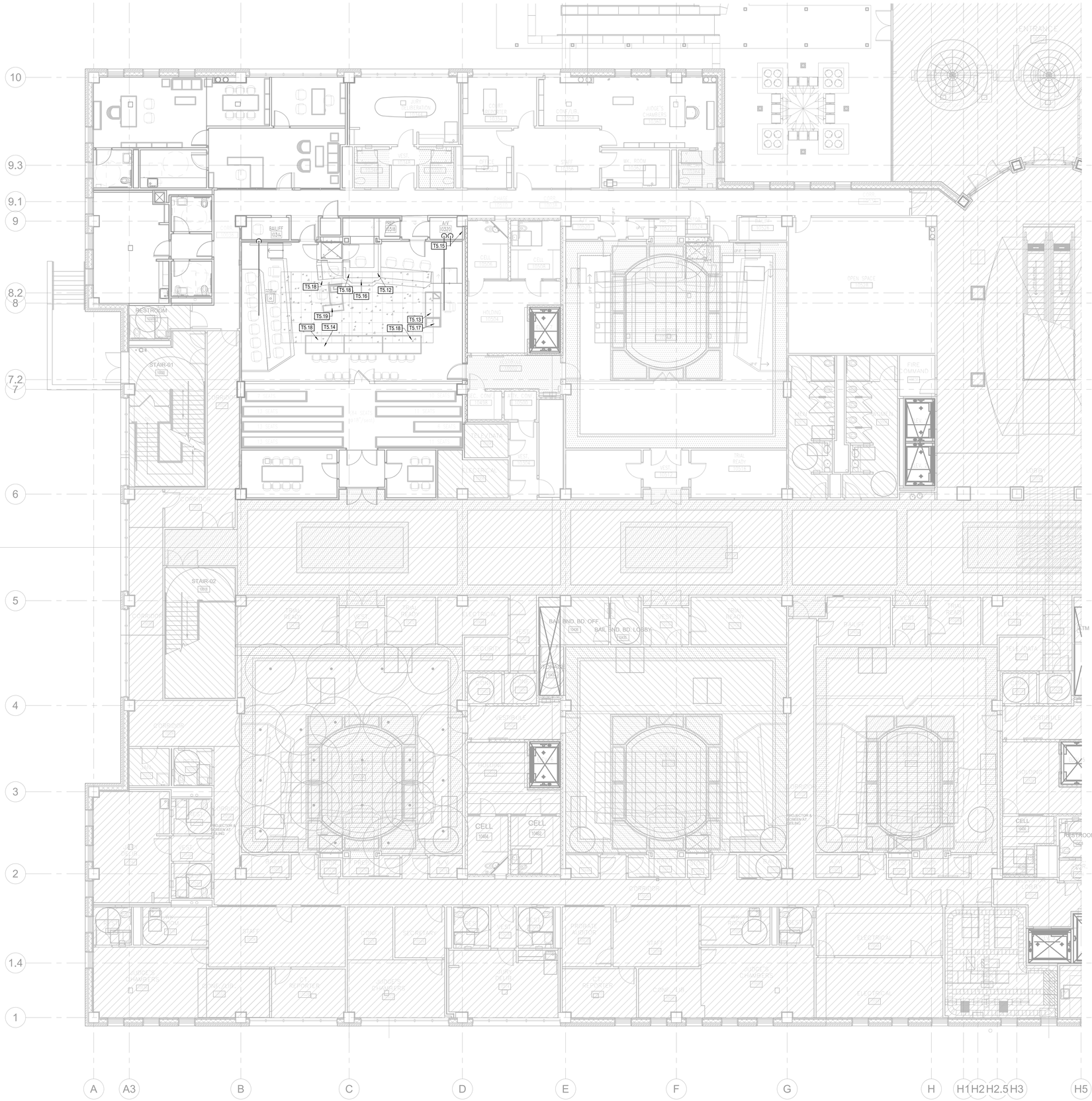


## TECHNOLOGY KEYED NOTES

T5.12 AUDIO SWITCH CONTROL

T5.13 17"- 19" LOCAL MONITOR

T5.14 GOOSENECK MICROPHONE

T5.15 STANDARD EQUIPMENT RACK ENCLOSURE

T5.16 LOW PROFILE SIDEBAR MICROPHONE

T5.17 ROOM MEDIA CONTROLLER

T5.18 17" - 22" PREVIEW MONITOR

T5.19 PROFESSIONAL DIGITAL VOICE RECORDING SYSTEM

## GENERAL FLOOR PLAN NOTES:

1. ALL TECHNOLOGY DEVICES, OUTLETS AND CABLE/CONDUIT PATHWAYS SHOWN ARE DIAGRAMMATIC ONLY AND ARE NOT MEANT TO SHOW THE EXACT LOCATION OR ROUTE. CONTRACTOR SHALL VERIFY WITH ARCHITECT AND OWNER FOR EXACT ROUTE, MOUNTING HEIGHT, AND LOCATION BEFORE INSTALLATION, AND SHALL COORDINATE WITH OTHER TRADES TO MAKE ANY FIELD ADJUSTMENTS AS NECESSARY TO AVOID COLLISIONS AND MEET THE PROJECT REQUIREMENTS.
2. CONDUITS AND BACKBOXES, SIZED PER DIV 27/28 SPECIFICATIONS, SHALL BE PROVIDED (BY DIV 26) FOR ALL TECHNOLOGY SYSTEM DEVICES MOUNTED ON WALL, FLOOR, AND OPEN OR SOLID FINISH CEILING. CONDUITS/SLEEVES SHALL BE PROVIDED FOR ALL CABLES ROUTED IN WALLS, OR THROUGH FULL HEIGHT PARTITIONS, OR THROUGH INACCESSIBLE CEILING PLENUM, OR THROUGH SPACES WITH EXPOSED CEILING DECK.
3. CABLES FOR DIFFERENT APPLICATIONS (DATA, AUDIO, VIDEO, SECURITY, ETC.) OR OF DIFFERENT MEDIA TYPE (COAX, UTP, ETC.) SHALL BE ROUTED IN SEPARATE PATHWAYS IN J-HOOKS, CONDUITS, SLEEVES, CORES, ETC. THROUGHOUT THE ENTIRE PATHWAY.
4. BUSHINGS SHALL BE INSTALLED AT EACH END OF THE CONDUITS BEFORE CABLES BEING PULLED THROUGH. PROVIDE PULL STRING IN EACH CONDUIT INSTALLED AND LEAVE ONE FOR FUTURE PULLING AFTER CABLE INSTALLATION IS COMPLETE.
5. NO NETWORK DATA CABLE RUN SHALL EXCEED 295 FEET IN TOTAL LENGTH INCLUDING UP/DOWN AND SERVICE LOOPS WITHOUT PRIOR APPROVAL FROM THE ARCHITECT AND ENGINEER. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR PROPER PATHWAY PLANNING.
6. NEW DATA, SECURITY AND INTERCOM DROPS SHALL TIE INTO EXISING SYSTEMS AND HOMERUN BACK TO IT/SEC/MER ROOM 10044 THROUGH EXISTING PATHWAYS.

1 TA2.11 **LEVEL 1 PARTIAL AV PLAN A**

1/8" = 1'-0"

TN PN


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DBR Project Number 243028

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**CLIENT**

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10/17/2024

**DRAWING HISTORY**

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**KEY PLAN**

D

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

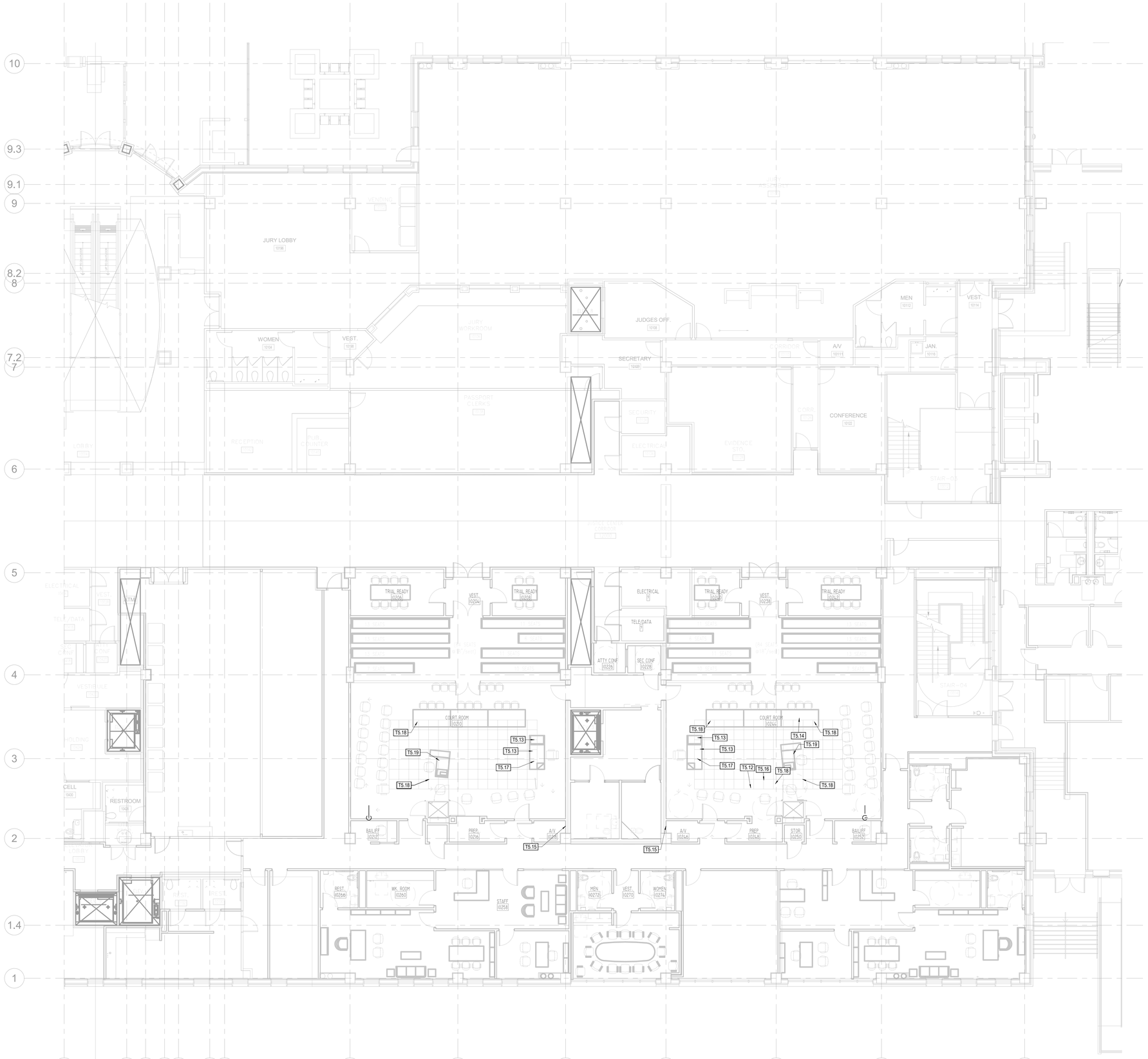
1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL AV PLAN A

**SHEET NUMBER**

TA2.11




## TECHNOLOGY KEYED NOTES

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6. NEW DATA, SECURITY AND INTERCOM DROPS SHALL TIE INTO EXISTING SYSTEMS AND HOMERUN BACK TO IT/SEC/MER ROOM 10044 THROUGH EXISTING PATHWAYS.

1 TA2.12 **LEVEL 1 PARTIAL AV PLAN B**
1/8" = 1'-0"


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TBPE Firm Registration No. 2234


| DBR Project Number | 243028 |
|---|---|
| RH DR RR MR AD | |

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**KEY PLAN**

D

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

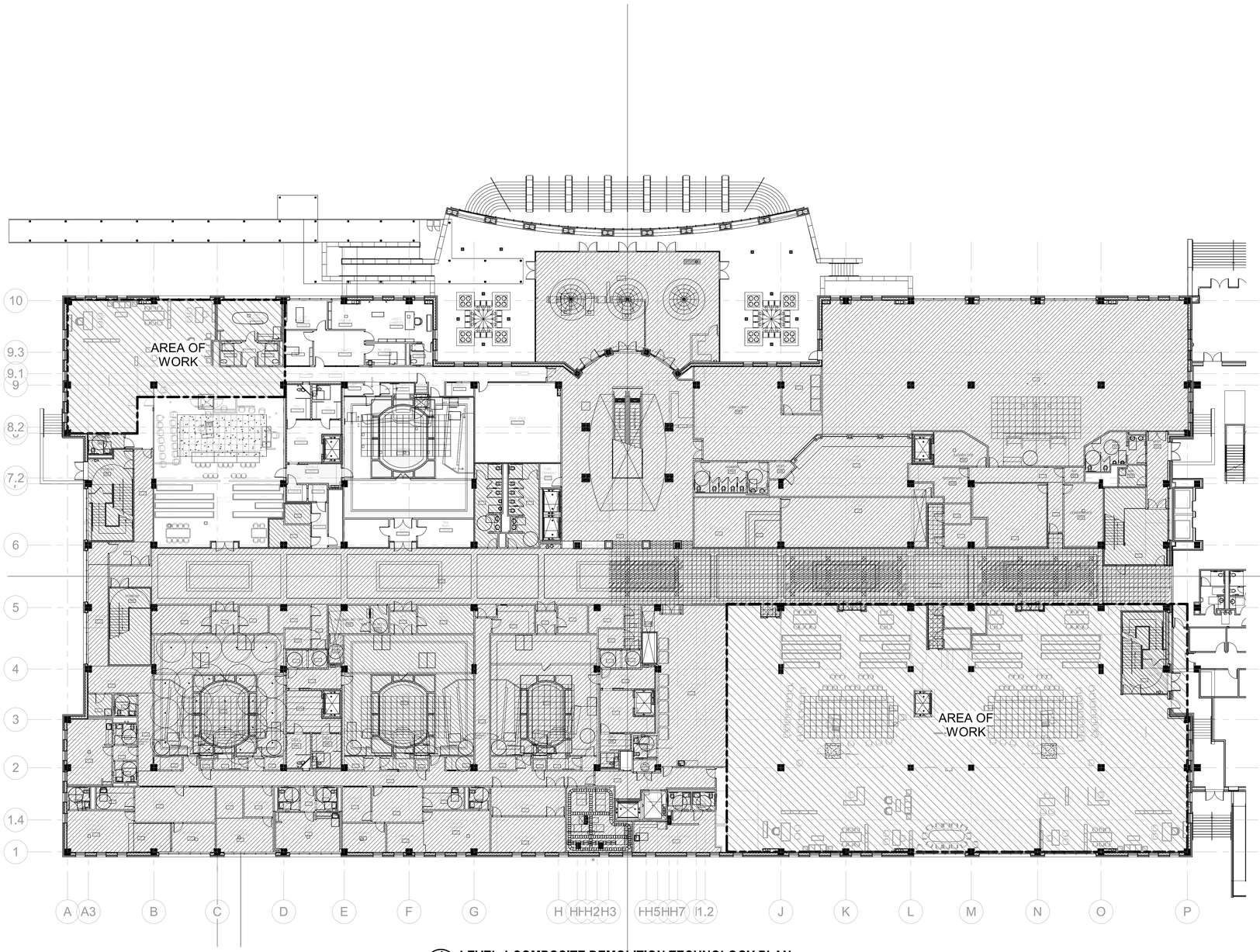
1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL AV PLAN B

**SHEET NUMBER**

TA2.12




1 TD2.10 **LEVEL 1 COMPOSITE DEMOLITION TECHNOLOGY PLAN**
1/16" = 1'-0"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LEVEL 1 COMPOSITE DEMOLITION TECHNOLOGY PLAN

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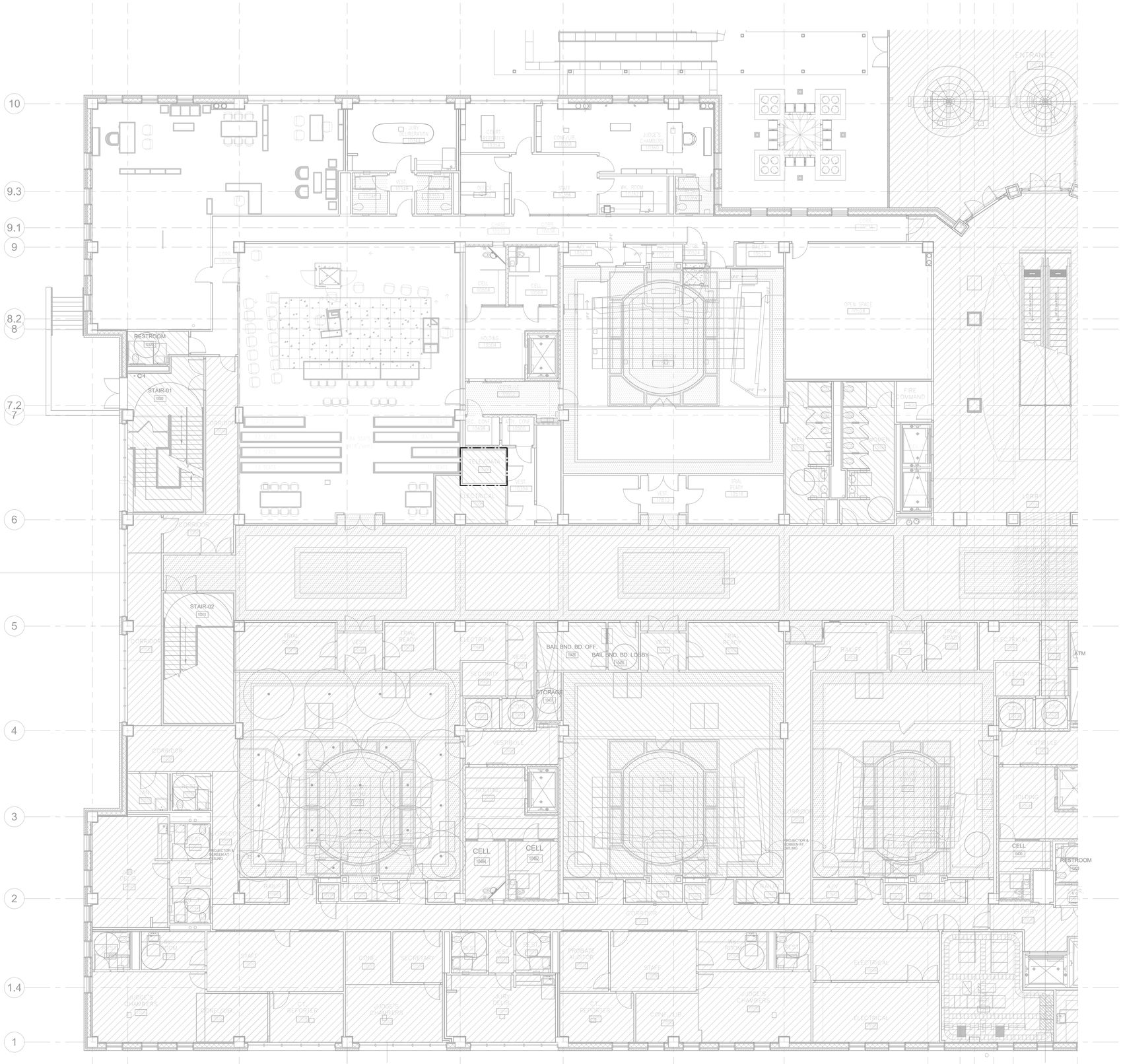


## TECHNOLOGY KEYED NOTES

## GENERAL DEMO SHEET NOTES:

1. GENERAL DEMOLITION NOTES APPLY TO ALL DEMO/REMODELING SCOPE.
2. IN AREAS WHERE CEILING IS BEING REMOVED, ALL EXISTING CEILING MOUNTED DEVICES NOT SCHEDULED FOR DEMOLITION OR REPLACEMENT SHALL BE REMOVED TO ALLOW FOR COMPLETE REMOVAL OF THE EXISTING CEILING. CONTRACTOR SHALL DOCUMENT DEVICE'S ORIGINAL LOCATION, LABEL AND PROPERLY PROTECT THE DEVICE FROM DAMAGE DURING CONSTRUCTION, AND RE-INSTALL AND RE-CONNECT IT AT THE SAME LOCATION AS IT WAS REMOVED FROM AFTER CEILING IS REPLACED.
3. COORDINATE ALL DEMOLITION ACTIVITIES WITH OWNER, ARCHITECT, AND ENGINEER. PROVIDE NO LESS THAN 10 WORKING DAYS' NOTICE PRIOR TO ANY SCHEDULED OUTAGES FOR ANY COMMUNICATION (DIV 27) AND LIFE SAFETY AND SECURITY (DIV 28) OUTAGES.
4. CONTRACTOR SHALL FULLY TEST ALL EXISTING TO REMAIN LOW VOLTAGE SYSTEM (INCLUDING BUT NOT LIMITED TO VOICE AND DATA CABLING SYSTEM, AV SYSTEM, PA, CAMERA SYSTEM, ACCESS CONTROL, INTRUSION ALARM) IN THE RENOVATION SCOPE OF WORK AREA, AND REPORT ANY TEST FAILURE OR MALFUNCTION OF ANY EXISTING DEVICE OR CABLE TO THE OWNER, ARCHITECT AND ENGINEER PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION WORK. ANY EXISTING-TO-REMAIN DEVICE OR CABLE FOUND DAMAGED OR MALFUNCTIONING AT THE TIME OF SUBSTANTIAL COMPLETION, BUT NOT REPORTED PRIOR TO STARTING WORK, SHALL BE REPLACED OR REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE PROJECT OR THE OWNER.
5. ALL CABLING SCHEDULED TO BE DEMOLISHED SHALL BE REMOVED IN ITS ENTIRETY FROM END TO END. NO ABANDONED CABLES SHALL BE LEFT IN THE CEILING PLENUM. ABONDONED CABLE IS DEFINED AS CABLE NOT TERMINATED AT BOTH ENDS AND NOT IDENTIFIED FOR FUTURE USE WITH A TAG.
6. VERIFY WITH OWNER PRIOR TO CONSTRUCTION IF ANY OF THE EQUIPMENT SCHEDULED TO BE DEMOLISHED SHOULD BE RETURNED TO OWNER. ALL EXISTING TO REMAIN EQUIPMENT AND CABLING SHALL BE PROPERLY PROTECTED FROM DAMAGE DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL REFERENCE ALL OTHER TRADES' CONSTRUCTION DOCUMENTS FOR FULL EXTENT OF THE DEMOTION TO BE PERFORMED, AND FIELD VERIFY THE EXISTING JOB-SITE CONDITIONS BEFORE BIDDING. NO CHANGE ORDER WILL BE ALLOWED FOR INCREASED COST ASSOCIATED WITH CONDITIONS WHICH COULD HAVE BEEN DETERMINED BY EXAMINING THE SITE AND WHOLE PROJECT DOCUMENTS BEFORE SUBMISSION OF PROPOSALS AND/OR BEFORE A CONTRACT IS AWARDED.
8. DEMOLITION DRAWINGS ARE BASED ON CASUAL FIELD OBSERVATION OR OUTDATED RECORD DOCUMENTS. CONTRACTOR SHALL REPORT ANY DISCREPANCY TO ARCHITECT AND ENGINEER BEFORE COMMENCEMENT OF THE CONSTRUCTION.
9. EXISTING MDF/IDF SPACE AND EQUIPMENT SHALL REMAIN AND PROTECTED DURNING CONSTRUCTION.
10. SECURITY, DATA AND INTERCOM EQUIPMENT IN ALL DEMO/REMODELING SCOPE SHALL BE DEMOLISHED BACK TO ORGIN.

## 1 LEVEL 1 PARTIAL DEMOLITION TECHNOLOGY PLAN A

TD2.11

1/8" = 1'-0"

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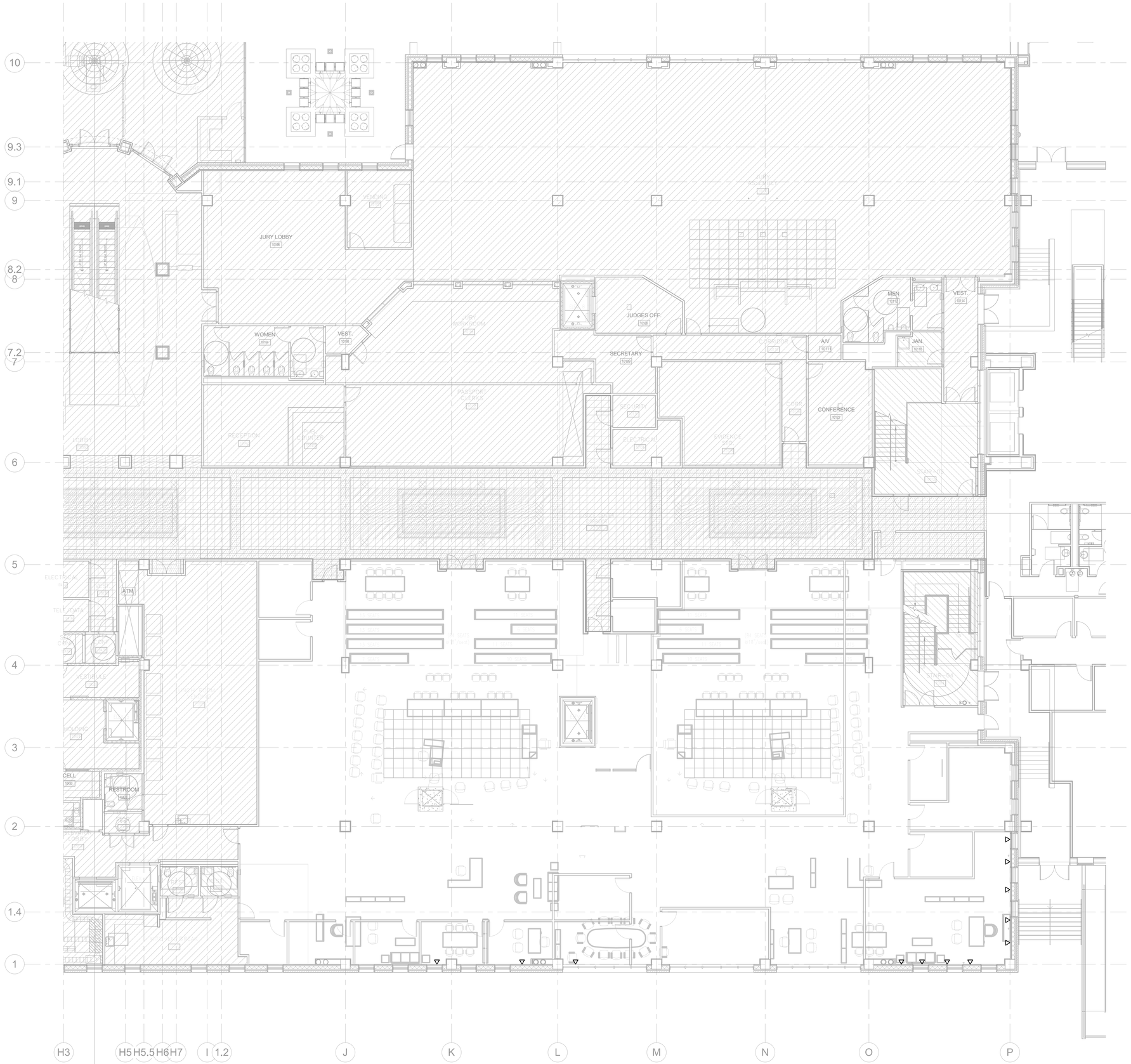


1 TD2.12 **LEVEL 1 PARTIAL DEMOLITION TECHNOLOGY PLAN B**
1/8" = 1'-0"

## TECHNOLOGY KEYED NOTES

## GENERAL DEMO SHEET NOTES:

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3. COORDINATE ALL DEMOLITION ACTIVITIES WITH OWNER, ARCHITECT, AND ENGINEER. PROVIDE NO LESS THAN 10 WORKING DAYS' NOTICE PRIOR TO ANY SCHEDULED OUTAGES FOR ANY COMMUNICATION (DIV 27) AND LIFE SAFETY AND SECURITY (DIV 28) OUTAGES.
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5. ALL CABLING SCHEDULED TO BE DEMOLISHED SHALL BE REMOVED IN ITS ENTIRETY FROM END TO END. NO ABANDONED CABLES SHALL BE LEFT IN THE CEILING PLENUM. ABONDONED CABLE IS DEFINED AS CABLE NOT TERMINATED AT BOTH ENDS AND NOT IDENTIFIED FOR FUTURE USE WITH A TAG.
6. VERIFY WITH OWNER PRIOR TO CONSTRUCTION IF ANY OF THE EQUIPMENT SCHEDULED TO BE DEMOLISHED SHOULD BE RETURNED TO OWNER. ALL EXISTING TO REMAIN EQUIPMENT AND CABLING SHALL BE PROPERLY PROTECTED FROM DAMAGE DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL REFERENCE ALL OTHER TRADES' CONSTRUCTION DOCUMENTS FOR FULL EXTENT OF THE DEMOTION TO BE PERFORMED, AND FIELD VERIFY THE EXISTING JOB-SITE CONDITIONS BEFORE BIDDING. NO CHANGE ORDER WILL BE ALLOWED FOR INCREASED COST ASSOCIATED WITH CONDITIONS WHICH COULD HAVE BEEN DETERMINED BY EXAMINING THE SITE AND WHOLE PROJECT DOCUMENTS BEFORE SUBMISSION OF PROPOSALS AND/OR BEFORE A CONTRACT IS AWARDED.
8. DEMOLITION DRAWINGS ARE BASED ON CASUAL FIELD OBSERVATION OR OUTDATED RECORD DOCUMENTS. CONTRACTOR SHALL REPORT ANY DISCREPANCY TO ARCHITECT AND ENGINEER BEFORE COMMENCEMENT OF THE CONSTRUCTION.
9. EXISTING MDF/IDF SPACE AND EQUIPMENT SHALL REMAIN AND PROTECTED DURNING CONSTRUCTION.
10. SECURITY, DATA AND INTERCOM EQUIPMENT IN ALL DEMO/REMODELING SCOPE SHALL BE DEMOLISHED BACK TO ORGIN.


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| DBR Project Number | 243028 |
|---|---|
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**CONSULTANT**

**REGISTRATION**

STATE OF TEXAS
MIKE L. ASHCRAFT
56590
LICENSED PROFESSIONAL ENGINEER
10/17/2024

**DRAWING HISTORY**

| № | DATE | DESCRIPTION |
|---|---|---|
| | 05/01/2024 | 100% DESIGN DEVELOPMENT |
| | 05/29/2024 | 50% CONSTRUCTION DOCUMENTS |
| | 08/19/2024 | 95% CONSTUCTION DOCUMENTS |
| | 09/20/2024 | 100% CONSTRUCTION DOCUMENTS |

**KEY PLAN**

D

**PROJECT NAME**

FORT BEND COUNTY FIRST FLOOR COURTROOM BUILDOUT

**PROJECT LOCATION**

1422 EUGENE HEIMANN CIRCLE
RICHMOND, TX 77469

**PROJECT NUMBER**

1007828.00

**SHEET TITLE**

LEVEL 1 PARTIAL DEMOLITION TECHNOLOGY PLAN B

**SHEET NUMBER**

TD2.12