

PROJECT
MANUAL
VOLUME 1

MAY 28, 2025



EMS ISD Agricultural Science Complex
EAGLE MOUNTAIN-SAGINAW ISD
FORT WORTH, TEXAS

OWNER:



**Eagle Mountain-Saginaw
Independent School District**
1200 Old Decatur Rd
Fort Worth, TX 76179

VLK Project No.
24-057.00

OWNER

**Eagle Mountain-Saginaw
Independent School District**

1200 Old Decatur Rd
Fort Worth, Texas 76179

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ARCHITECT

VLK

Kayse Thomas
1320 Hemphill St, Suite 400
Fort Worth, Texas 76104
Phone: 817.633.1600
www.vlkarchitects.com



05/28/2025

CIVIL ENGINEER

Teague, Nall & Perkins, Inc.

Firm Registration Number: F-230
Matt Mantong, P.E.
5237 N. Riverside Drive, Suite 100
Fort Worth, Texas 76137
Phone: 817.336.5773
www.tnpinc.com



05/28/2025

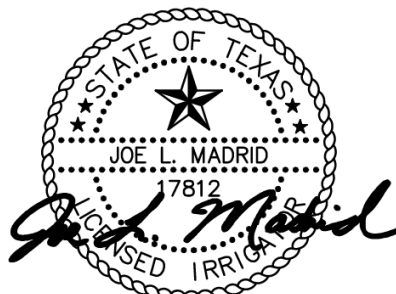
LANDSCAPE / IRRIGATION

Teague, Nall & Perkins, Inc.

Firm Registration Number: F-230
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Phone: 817.336.5773
www.tnpinc.com



05/28/2025



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**EMS ISD Agricultural Science Complex
EAGLE MOUNTAIN-SAGINAW ISD
FORT WORTH, TEXAS**

VLK Project No.
24-057.00

FOOD SERVICE

Foodservice Design Professionals

Lance Brooks

584 N Kimball Ave

Southlake, Texas 76092

Phone: 972.245.5300

www.foodservicedesignprofessionals.com

STRUCTURAL ENGINEER

L.A. Fuess Partners, Inc.

Firm Registration Number: F-537

Lance Munger, P.E.

3333 Lee Parkway, Suite 300

Dallas, Texas 75219

Phone: 214.593.1186

www.lafp.com



M.E.P.T ENGINEER

RWB Consulting Engineers

Firm Registration Number: F-2176

Joseph Proctor, P.E.

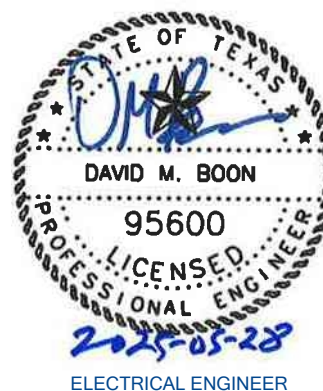
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Dallas, Texas 75251

Phone: 972.788.4222

www.rwb.net



PROJECT MANUAL VOLUME 1

MAY 28, 2025

EMS ISD Agricultural Science Complex EAGLE MOUNTAIN-SAGINAW ISD FORT WORTH, TEXAS

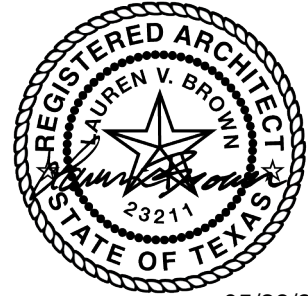
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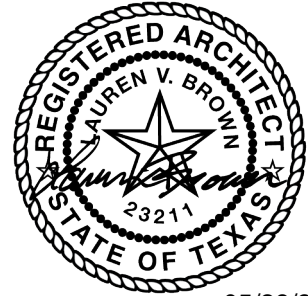
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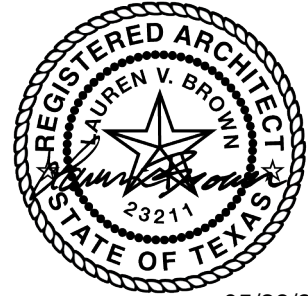
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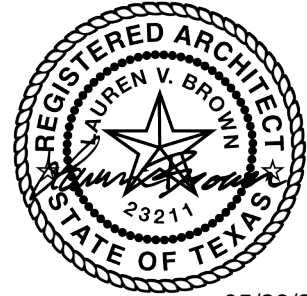
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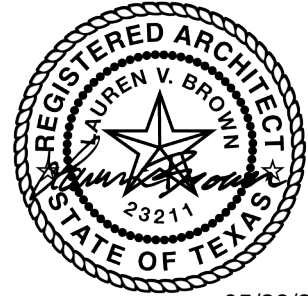
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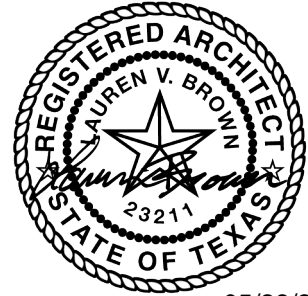
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Eagle Mountain-Saginaw Independent School District
REQUEST FOR COMPETITIVE SEALER PROPOSALS (RFCSP)

RFCSP Number: 2425-012-0

**RFCSP Title: Dick and Heidi Elkins Agricultural
Science Facility**

Part 1 Due Date: July 10, 2025

Part 2 Due Date: July 14, 2025

Prior to: 2:00 P.M. CDT

Sealed CSP will be received in accordance with the attached specifications. The sealed envelope containing your CSP should be plainly marked with the CSP title, number, and opening date and time. CSPs are publicly opened. You are invited to attend. **PLEASE NOTE: Late CSPs WILL NOT be accepted.**

Mail or deliver 1 original and 3 copies of the complete CSP package, plus 1 digital copy to:

Eagle Mountain-Saginaw Independent School District
Attn: Taylor Shaw, Director of Purchasing
1600 Mustang Rock
Fort Worth, Texas 76179

All questions must be submitted in writing (email preferred) and received on or before **Thursday June 23, 2025, 2:00 pm CDT. No verbal responses will be provided.** Please note that CSP Rankings will be available on our website ([www.emsisd.com/Departments/Purchasing/Bid Awards](http://www.emsisd.com/Departments/Purchasing/Bid%20Awards)) no later than the 7th day after the date the contract is awarded. Address questions to:

Taylor Shaw
Email: tshaw@ems-isd.net

PROPOSER IDENTIFICATION: (Please print information clearly.)

Firm Name: _____	Date: _____
Address: _____	Phone: _____
_____	Fax: _____
City/St/Zip: _____	Email: _____

You MUST sign the CSP Response form (FORM A) in order for your CSP to be accepted.

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ADVERTISEMENT FOR PROPOSALS

Competitive Sealed Proposals for “**DICK AND HEIDI ELKINS AGRICULTURAL SCIENCE FACILITY**” will be received by Taylor Shaw in the Purchasing Department of the Eagle Mountain-Saginaw Independent School District, located at 1600 Mustang Rock Rd, Fort Worth, TX 76179.

The Proposals will be submitted in two parts, **Part 1 is due July 10, 2025 prior to 2:00 pm, CDT and Part 2 is due July 14, 2025 prior to 2:00 pm CDT**. The proposals is submitted in two parts as follows: PROPOSAL FORM – BASE PROPOSAL and PROPOSAL FORM – QUALIFICATIONS

Proposals received after this time will not be accepted.

The clock located in the EMS ISD Central Administration Visitor Lobby is considered the official time for receiving and opening CSPs.

The Project Manual, Drawings and Addenda are available at the Eagle Mountain-Saginaw ISD website (<https://www.emsisd.com/Page/340>). Addenda will only be published on the website. No addenda will be mailed, emailed, or faxed to any document holder.

Any proposer may withdraw his proposal, either personally or by written request, at any time prior to the scheduled time for opening proposals. No proposer may withdraw his proposal for a period of 60 days after the date set for opening thereof, and any proposal shall be subject to acceptance by the Owner during this period.

Proposal Security in the amount of five percent (5%) of the proposal sum must accompany each proposal.

The Owner reserves the right to reject any or all proposals and to waive any formality in connection therewith.

Within 45 days after the opening of the sealed proposals, the District will evaluate and rank each proposal submitted in relation to the selection criteria set forth. The District will select the proposal that offers the best value to the District based on the selection criteria and on the ranking evaluation; price alone will not be determinative.

PRE-SUBMITTAL CONFERENCE

A pre-submittal conference is scheduled for **2:00 pm, CDT, Wednesday, June 11, 2025** at the Eagle Mountain-Saginaw ISD Central Administration Building, 1600 Mustang Rock Road, Fort Worth, TX 76179, with representatives of the Owner and Engineer available to address solicitation document issues with potential proposers.

DOCUMENT 00 21 16

INSTRUCTIONS TO PROPOSERS

PART 1 – GENERAL

1.1 DEFINITIONS

- A. All definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, 2017 Edition and Section 01 42 16 – Definitions, are applicable to these Instruction to Proposers.
- B. Proposal documents include the Request for Competitive Sealed Proposals, Instructions to Proposers, the Proposal Forms, and the proposed Contract Documents, including Addenda issued prior to receipt of proposals.
- C. Addenda are written or graphic instruments issued prior to the execution of the Contract, which modify or interpret the proposal documents, including Drawings and Specifications, by additions, deletions, clarifications, or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed.
- D. “Reed, Wells, Benson and Company” will be hereafter referred to in this Project Manual as “Engineer” and correspondence shall be addressed to: 12001 North Central Expressway, Suite 1100, Dallas, TX 75234.

1.2 EXAMINATION OF DOCUMENTS AND SITE

- A. Each proposer, by making his Proposal, represents that he has read and understands the Proposal Documents.
- B. Each proposer, by making his Proposal, represents that he has visited the site, performed investigations and verifications as necessary and familiarized himself with the local conditions under which the Work is to be performed and will be responsible for errors in his proposal resulting from his failure to do so.
- C. Each proposer by making his proposal represents that his proposal is based upon the materials, systems and equipment required by the Proposal Documents without exception.

1.3 QUESTIONS

Proposers shall submit questions about the Proposal Documents to Taylor Shaw, tshaw@ems-isd.net in writing not later than June 23, 2025 by 2:00 pm CDT. Replies will be issued to proposers as an addendum to the Proposal Documents and shall become a part of the Contract. The Engineer and Owner will not be responsible for oral clarification.

1.4 SUBSTITUTIONS

Each proposer represents by submitting his proposal that his proposal is based upon the materials and equipment described in the proposal documents.

1.5 PROPOSAL SECURITY

- A. A certified check; cashier's check; signed, dated, and embossed proposal bond in an amount equal to 5% of the largest possible total proposal and made payable to the Owner must accompany each proposal. This shall be considered as the amount of liquidated damages, which the Owner will sustain, by failure or refusal of the proposer to execute and deliver the contract and the statutory performance and payment bonds should the Contract be awarded to him.
- B. If the proposer defaults in executing and delivering the Contract and the statutory performance and payment bonds within ten days after written notification from the Owner of the award of Contract to him, then the check or proposal bond shall become the property of the Owner, not as a penalty, but as liquidated damages, as payment for damages due to excess costs, delay and other inconveniences.
- C. Proposals shall remain in effect for a period of 60 days after the time established for receipt thereof, and during this time the Owner may accept or reject the proposals as he so elects. If the proposal is not accepted within 60 days after the time set for submission of proposals, or if the successful proposer executes and delivers said contract and the performance and payment bonds, then the check or proposal bond will be returned.
- D. Proposal Bond shall be executed by a Surety Company that is:
 - 1. Approved by the school district, and duly authorized and admitted to do business in the State of Texas as determined by the State Board of Insurance.
 - 2. Listed by the United States Department of the Treasury in that issue of the "Federal Register" covering the date on which the bond was executed and the date that Surety Company has obtained reinsurance, if applicable, from a reinsurer that is authorized and admitted as a reinsurer in this state and is the holder of a certificate of authority from the United States secretary of the treasury.
- E. Facsimiles or copies of Proposal Bond will not be acceptable. Submit fully executed originals of required documents.

1.6 STATUTORY PERFORMANCE BOND AND STATUTORY LABOR AND MATERIAL PAYMENT BOND

- A. A Statutory Performance Bond and a Statutory Labor and Material Payment Bond will be required of the successful proposer and shall be executed by a surety company acceptable to the Owner and authorized to do business in the State of Texas. Each bond shall be in an amount equal to one hundred percent (100%) of the contract price. The Performance Bond and the Labor and Material Payment Bond may be in one or separate instruments in accord with local law and are to be delivered to the Owner no later than ten days after written notification from the Owner of the award of Contract to him. Failure or neglecting to deliver said bonds, as specified, shall be considered as having abandoned the contract and the proposal security will be retained as liquidated damages
- B. Bonds shall be executed by a Surety Company that is:
 - 1. Approved by the school district, and duly authorized and admitted to do business in the State of Texas as determined by the State Board of Insurance.

2. Listed by the United States Department of the Treasury in that issue of the “Federal Register” covering the date on which the bond was executed and the date that Surety Company has obtained reinsurance, if applicable, from a reinsurer that is authorized and admitted as a reinsurer in this state and is the holder of a certificate of authority from the United States secretary of the treasury.

1.7 SUBMITTAL

- A. Submit proposals in accordance with the Request for Competitive Sealed Proposals. Enclose proposal in an opaque, sealed envelope. Each CSP shall be properly identified with the CSP Number, CSP Title, Name of Company submitting CSP, and the established time and date to be opened.
- B. Preparation of Proposals: Proposals shall be submitted on unaltered proposal forms furnished by Eagle Mountain-Saginaw ISD. Fill in all blank spaces. If there are entries (blank spaces) on the proposal form which do not apply to a particular proposer, these entries shall be marked “N.A.” (Not Applicable) by the proposer. No proposals will be considered that are amended or are qualified with conditional clauses, alterations, items not called for in the proposal, or irregularities of any kind which, in the Owner’s opinion, may disqualify the proposer.
- C. Reference DOCUMENT 00 43 93 - PROPOSAL SUBMITTAL CHECKLIST for Proposal document submittal requirements.
 1. Part “A” a. SECTION 00 42 00 - PROPOSAL FORM - BASE PROPOSAL b. Cashier’s Check, Certified Check, or Bid Bond for no less than 5% of the largest possible total for the proposal submitted. c. Required Forms (A through H), duly filled out and signed.
 2. Part “B”
 - a. SECTION 00 43 00 - PROPOSAL FORM - QUALIFICATIONS
 - b. Contractor’s Qualification Statement AIA Document 305
 - c. Contractor may include any other information that responds to the Selection Criteria listed.

1.8 COMPETITIVE SEALED PROPOSAL EVALUATION AND RANKING PROCEDURES

- A. The following procedures shall be used to evaluate and recommend a construction contractor for selection by the School District through the use of Competitive Sealed Proposals, as authorized in Texas Government Code 2269.
- B. Proposal Evaluation Committee
 1. For each construction project utilizing the Competitive Sealed Proposal method of procurement, the School Board shall convene a Proposal Evaluation Committee (Committee) that may be comprised from of the following individuals:
 - a. School Board Members
 - b. School Administration
 - c. District’s Financial Officer or Consultant
 - d. Staff
 - e. Project Architect
 - f. Project Engineer

g. Program Manager

C. Proposal Evaluation Committee Function

1. The Committee shall perform an evaluation of all submitted Proposals and shall recommend an order of selection ranking of all Proposers to the School Board. The following procedures shall be used by the Committee in the evaluation process:
 - a. As soon as possible following the public opening of Proposals, the Committee shall meet to conduct a preliminary examination of each Proposal for compliance with the published requirements.
 - b. The Committee shall conduct thorough discussions and evaluations of all Proposals.
 - c. Within forty-five (45) days after publicly opening the Proposals, the Committee shall produce a ranking of Proposers in the order of the best value to the School District.
 - d. The recommended ranking shall be based on the data furnished by the Proposers in response to the request for Competitive Sealed Proposals. The following is a list of rating categories and values for each category. To provide the best value to the School District, these categories and values may be revised by the Committee based on the project type and conditions at the time Proposals are requested. Unless modified by addendum prior to opening of the Proposals, the following listing of categories and values shall be utilized by the Committee:

RATING CATEGORY VALUE

Proposed Construction Contract Amount	40.00
Proposed Construction Contract Time	5.00
TAB 2 - Schedule	10.00
TAB 3 - Key Project Personnel	10.00
TAB 4 - Subcontractors	10.00
TAB 5 - Project Experience	10.00
TAB 6 - Financial Background	5.00
TAB 7 - Claims and Suits	2.00
TAB 8 - Quality Control Program	2.00
TAB 9 - Project Approach	6.00
TOTAL OF WEIGHTED VALUE	100.00

D. General Evaluation Procedures

1. Proposed Construction Contract Amount and Proposed Construction Contract Time will be rated using mathematical processes described below. Each of the other listed rating categories shall be evaluated on a scale of zero to ten. Each rating category response will be evaluated, and the Committee shall produce a single evaluation determination in each category for each Proposal received.

E. Proposed Construction Contract Amount Evaluation

1. This evaluation ranking shall be based on a value of ten (10) assigned to the lowest proposed amount. Each successive Proposer's contract amount shall be scored as follows; Low Proposer amount divided by the next low Proposer amount and multiply that figure by 10 equals the score for that Proposer.

2. These resulting ratings are then multiplied by the value of this rating category, producing the construction contract amount score for each Proposer.

F. Proposed Construction Contract Time Evaluation

1. The evaluation ranking of Proposed Construction Contract Time shall be accomplished by the same mathematical process as the Contract Amount Evaluation. The value of ten (10) is assigned to the shortest Proposed Construction Contract Time.
2. These resulting ratings are then multiplied by the value of this rating category, producing the construction contract amount score for each Proposer.

G. Scoring

1. Proposers may receive equal rating in the Proposed Construction Contract Amount or the Proposed Construction Contract Time category if their proposed amounts in these categories are identical.
2. With the exception of the Proposed Construction Contract Amount and Proposed Construction Contract Time ratings, all other category rating determinations among Proposers may receive identical values if, in the opinion of the Committee, the qualification data provided by Proposers are determined to be equal for a selected category.
3. Upon determining a rating for each category, a categorical score for each Proposer shall be calculated by multiplying the category value by the Committee determined rating.
4. The total score for a Proposer shall be determined by adding the scores received for each category. The maximum score attainable for all categories shall be one hundred (100).
5. The Committee shall produce a tabulation of scores, which identifies the Proposers their Proposed Construction Contract Amounts, their Proposed Construction Contract Times, and their individual total scores.

1.9 ESTIMATED BUDGET

- A. The estimated budget for this project is \$20,000,000.00.

WAGE RATES

Reference DOCUMENT 00 73 46 – PREVAILING WAGE RATES.

1.10 SELECTION CRITERIA

Reference DOCUMENT 00 22 16 – EAGLE MOUNTAIN-SAGINAW ISD
SUPPLEMENTARY INSTRUCTIONS TO PROPOSERS, SECTION 4 – CSP
EVLAUATION CRITERIA.

1.11 MODIFICATION AND WITHDRAWAL

No proposal may be changed, amended, or modified after submittal. Proposers may withdraw proposals prior to proposal opening.

1.12 EXECUTION OF CONTRACT

- A. The Owner reserves the right to accept any proposal, to reject any and all proposals, or to negotiate contract terms with the various proposers, when such is deemed by the Owner to be in his best interest.
- B. Notwithstanding delays in the preparation and execution of the formal contract agreement, each proposer shall be prepared, upon written notice of proposal acceptance, to commence work on or before a date stipulated in an official written order of the Owner to proceed.
- C. The accepted proposer shall assist and cooperate with the Owner in preparing the formal contract agreement, and within 5 days following its presentation shall execute same and return it to the Owner.
- D. Form for the contract agreement will be AIA Document A101, Standard Form of Agreement Between Owner and Contractor, Stipulated Sum, 2017 Edition.

1.13 TIME OF COMPLETION AND LIQUIDATED DAMAGES

- A. The "Notice-to-Proceed" issued by the Owner shall be approximately Wednesday, July 30, 2025.
- B. Substantial Completion date shall be established as August 3, 2026.
 - 1. Reference DOCUMENT 00 42 00 - PROPOSAL FORM - BASE PROPOSAL for Alternates related to the Substantial Completion date.
 - 2. While school is in session, access to buildings shall be only during nights and weekends. School maintenance staff summer hours are 7:30am - 5:30pm Monday through Thursday. Any work required outside of these hours will be required to be coordinated with the Owner.
- C. Failure of the Contractor to complete the Work by the contract date will result in damages being sustained by the Owner. Such damages are, and will continue to be, impracticable and extremely difficult to determine. Due consideration will be given to delays falling within terms of the General Conditions of the AIA project contract.
- D. The Contractor will pay the Owner the amount indicated on the Proposal Form and in the Contract for each calendar day of delay in finishing the Work in excess of time specified for Substantial Completion and for Final Completion, plus authorized time extensions. Execution of the Contract under these specifications shall constitute agreement by the Owner and Contractor that the amount indicated is the minimum value of the costs and actual damage caused by failure of the Contractor to reach Substantial Completion and Final Completion of the Work within the allotted time, that such sum is Liquidated Damages and shall not be construed as a penalty, and that such sum may be deducted from payments due the Contractor if such delay occurs.

1.14 SALES TAX EXEMPTION

The Owner qualifies for exemption from State and Local Sales Taxes as set forth in the Eagle Mountain-Saginaw General Conditions (00 22 16).

DOCUMENT 00 22 16

**EAGLE MOUNTAIN-SAGINAW ISD
SUPPLEMENTARY INSTRUCTIONS TO PROPOSERS**

In submitting a CSP, Proposer understands and agrees to be bound by the following terms and conditions which shall be incorporated into any future contracts, agreements, or purchase orders relating to this CSP between the Contractor and the Eagle Mountain-Saginaw Independent School District.

By submitting a CSP, each proposer agree to waive any claim it has or may have against the Eagle Mountain-Saginaw Independent School District arising out of or in connection with the administration, evaluation, or recommendation of any CSP; waiver of any requirements under the CSP documents; acceptance or rejection of any CSPs; and award of Contracts, if any.

SECTION 1 – GENERAL INSTRUCTIONS

- 1.1 To be considered a responsive CSP, all pages requiring signature, the Cover Page, and any/all attachments (reference Proposal Submittal Checklist), must be completed with all requested information, signed and returned sealed in an envelope or other appropriate package adequate to conceal and contain the contents prior to the CSP date and time. Each CSP shall be placed in a separate envelope and properly identified with the CSP Number, CSP Title, Name of Company submitting CSP, and the established time and date to be opened.
- 1.2 The Proposer is strongly encouraged to read the entire CSP document prior to submitting response. Failure to provide the information requested in its entirety may be grounds for disqualification of CSP.
- 1.3 If any exceptions are taken to any portion of this CSP, the Proposer must clearly indicate the exception taken and include a full explanation on the Deviation/Compliance Form or as a separate attachment to the CSP. The failure to identify exceptions or proposed changes will constitute acceptance by the Supplier of the CSP as proposed by the District. The District reserves the right to reject a CSP containing exceptions, additions, qualifications, or conditions.
- 1.4 The CSP response must be signed by an individual authorized to contractually bind the company submitting the CSP. A failure to sign the CSP will cause it to be rejected as non-responsive. CSPs must give full firm name and address of proposer. Person signing CSP should show title or authority to bind his/her firm in a contract.
- 1.5 CSPs must be received in the Purchasing Department office **prior to** the hour and date specified in this document or any subsequent Addenda. No other published dates will be binding. **LATE CSPS WILL NOT BE ACCEPTED.** No oral, telegraphic, telephonic, electronic mail, or facsimile transmitted CSPs will be considered. The clock located in the EMS ISD Central Administration Visitor Entrance is considered the official time for receiving and opening CSPs.

- 1.6 Sealed CSPs shall be mailed or otherwise delivered to the following address:

Eagle Mountain-Saginaw Independent School District
Attention: Taylor Shaw
1600 Mustang Rock Rd.
Fort Worth, Texas 76179

- 1.7 All questions regarding this invitation must be submitted in writing (email preferred) to Taylor Shaw, tshaw@ems-isd.net. Request for information/interpretation must be received on or before June 23, 2025 at 2:00 pm CDT. Only questions answered by formal written addenda will be binding.
- 1.8 Addenda will be posted to the Eagle Mountain-Saginaw ISD website (<https://www.emsisd.com/Page/340>). It is the responsibility of each proposer to obtain all addenda that pertains to this CSP. **Proposers who submit a CSP without acknowledging receipt of all addenda issued may be deemed to have submitted a CSP not responsive to this solicitation.** Failure to receive such addenda does not relieve proposer from any obligation under the CSP submitted. All formal written addenda become a part of the CSP documents. Proposers shall acknowledge receipt of all addenda in the CSP Response Form.
- 1.9 CSPs must remain open for acceptance for a period of **sixty (60) days** subsequent to the opening of CSPs, unless otherwise indicated, to allow time for the offer(s) to be evaluated and Board of Trustees action, if required.
- 1.10 The successful proposer(s) will be notified in writing (manifested by an award letter) after EMS ISD Board of Trustees approval.
- 1.11 All Proposers must execute the forms enclosed (or otherwise requested herein) for the CSP to be considered responsive. The name of the company representative on these forms should be the same. All supplemental information required by the CSP Form must be included with the CSP. Failure to provide complete and accurate information may disqualify the proposer.
- 1.12 The Texas Ethics Commission adopted Forms CIS and CIQ. Failure to abide by these new statutory requirements can result in possible criminal penalties. Contractors that do business with a school district are required to file a questionnaire to identify any potential conflicts of interest. The CONFLICT OF INTEREST QUESTIONNAIRE can be downloaded from the [Purchasing website](#) or the [Texas Ethics Commission website](#).
- 1.13 The Texas Legislature adopted House Bill 1295 – Certificate of Interested Parties. EMS ISD may not enter into certain contracts with a business entity unless the business entity submits a disclosure of interested parties to EMS ISD at the time the business entity submits the signed contract. Additional information is available on the [Texas Ethics Commission website](#). Use the CSP number as the “Contract ID number” and the title of the CSP for the “Description of Goods and Services.”
- 1.14 Pursuant to Texas Government Code Ann. Chapter 2271, if Contractor is a for-profit organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company, or affiliate of those entities or business associations

(specifically excluding sole proprietorships) that exists to make a profit, has ten (10) or more full-time employees, and the value of the contract with Owner is \$100,000 or more, Contractor certifies to the District, by submitting a proposal or signing a contract with the District, that the Contractor does not boycott Israel and will not boycott Israel during the term of this Agreement.

- 1.15 Pursuant to Texas Government Code Ann. Chapter 2252, the Proposer verifies and affirms that it is not a foreign terrorist organization as identified on the list prepared and maintained by the Texas Comptroller of Public Accounts. If Contractor has misrepresented its inclusion on the Comptroller's list, such omission or misrepresentation will void this Contract.
- 1.16 Pursuant to Texas Government Code Ann. Chapter 2272, by submitting a proposal and entering a contract with EMS ISD on such proposal, the Contractor verifies by its signature on the proposal submission that it is not an abortion provider or an affiliate of abortion providers, whereby the provider or affiliate receives something of value derived from state or local tax revenue. Any contract entered into by the District is void if the Contractor has such a prohibited affiliation or contractual relationship.
- 1.17 Contractor is required to make any information created or exchanged with the state pursuant to this contract, and not otherwise excepted from disclosure under the Texas Public Information Act, available in a format that is accessible by the public at no additional charge to the state.
- 1.18 The requirements of Subchapter J, Chapter 552, Government Code Ann., may apply to this CSP and the proposer agrees that the CSP can be terminated if the proposer knowingly or intentionally fails to comply with the requirements of that subchapter.
- 1.19 If Contractor is not a sole proprietorship, has ten (10) or more employees, and the value of Contractor's proposal has a value of \$100,000 or more, Contractor certifies by submitting Contractor's proposal that it does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association, as defined by Texas Government Code Ann. Chapter 2274, and will not during the term of any contract with the EMS ISD, unless excepted from that law.
- 1.20 As required by Texas Government Code Ann. Chapter 2274, if Contractor has ten (10) or more employees, is not a sole proprietorship, and if the value of Contractor's proposal has a value of \$100,000 or more, Vendor certifies by submitting Contractor's proposal that it does not boycott energy companies and will not during the term of any contract with the EMS ISD, unless excepted by that law.
- 1.21 It is the intent of the Eagle Mountain-Saginaw Independent School District to foster utilization of historically underutilized businesses (HUBS) including Disadvantaged/Minority/Women-Owned Business Enterprises in its procurement activities. The District is particularly interested in receiving CSPs directly from HUBS or from joint ventures involving HUB representation.
- 1.22 It is the policy of the Eagle Mountain-Saginaw Independent School District not to discriminate on the basis of sex, disability, race, color, or national origin in its educational programs and/or activities, nor in its employment practices.

- 1.23 In order to ensure the integrity of the selection process, Proposer's employees, officers, agents, or other representatives shall not lobby or attempt to influence a vote or recommendation related to the Proposer's response, directly or indirectly, through any contact with school board members or other district officials from the date this CSP is released until the award.
- 1.24 This CSP is subject to cancellation by the District if any person significantly involved in initiating, negotiating, securing, drafting, or creating the offer on behalf of Eagle Mountain-Saginaw Independent School District, is at any time while the CSP is in effect, an employee of any other party to the CSP in any capacity or a consultant to any other party of the CSP with respect to the subject matter of the CSP.
- 1.25 Any board member who has any substantial interest, either direct or indirect, in any business entity seeking to contract with the District, shall, before any vote or decision on any matter involving the business entity, file an affidavit stating the nature and extent of interest and shall abstain from any participation in the matter. This is not required if the vote or decision will not have any special effect on the entity other than its effect on the public. However, if a majority of the governing body are also required to file, and do file similar affidavits, then the member is not required to abstain from further participation. Vernon's Texas Codes Annotated, Local Government Code, Ch. 171.
- 1.26 Contractors (owners, officers, employees, volunteers, etc.) may not work on district property where students may or may not be present when they have charges pending, have been convicted, received probation, or deferred adjudication for the following:
- A. Any offense against a child
 - B. Any sex offense
 - C. Any crimes against person involving weapons or violence
 - D. Any felony offense involving controlled substances
 - E. Any felony offense against property
 - F. Any other offense the District believes might compromise the safety of students, staff, or property
- 1.27 It is the responsibility of the Contractor, subcontractors, and their employees, to comply with Senate Bill 9 – Fingerprinting-based criminal background checks. Upon request, all contractors, subcontractors, and their employees must submit to the Eagle Mountain-Saginaw ISD, proof of a satisfactory criminal record history of all individuals working on District property through background checks conducted as required by Senate Bill 9. The criminal record history must be obtained by the successful proposer before any work is performed. The information regarding the requirements for conducting a criminal records check is posted on The Texas Department of Public Safety's website, www.txdps.state.tx.us by clicking open Crime Records.
- 1.28 Use or possession of weapons, firearms, tobacco, alcohol beverages, controlled substances, and/or drugs, even in vehicles, is strictly prohibited on school district property. Any harassment of employees, students, or volunteers is also strictly prohibited.
- 1.29 Contractors, subcontractors, and their employees, who perform work inside the EMS ISD facilities are hereby notified that our buildings may contain asbestos containing materials. This notification is required by both the State of Texas Department of State Health Services and the Federal EPA Asbestos regulations. These guidelines cover both EMS ISD's responsibilities and

the Employer's responsibility to their employees. As a Contractor, subcontractor, or their employee, it is your responsibility to check each building prior to performing any work in that facility. These building materials may include but are not limited to: ceiling tile, floor tile and mastic, sheetrock, tape and bed compound, thermal pipe insulation, spray-on ceiling material, calks, and roofing products. As there have been numerous asbestos containing products manufactured over the years, you must check each building's Asbestos Management Plan. This plan is normally kept in the main office. Check with the school secretary and she will allow you to look at it. It is the contractor's responsibility to notify all employees working for them that EMS ISD facilities may contain asbestos and where their employees may find the facility's Asbestos Management Plan. Again, it is the contractor's responsibility to check the Asbestos Management Plan for each facility prior to working in the facility and then to notify their employees performing the actual work. The information is found in section eight (8) for all asbestos that are remaining in the building. If after looking in the Asbestos Management Plan you are uncertain about whether the area you will be working in contains asbestos or not, please contact Clete Welch, Chief Operating Officer, at 817-306-0864 for further assistance.

SECTION 2.0 – CSP REQUIREMENTS AND CONDITIONS

2.1 WITHDRAWING CSP

- 2.1.1 CSPs deposited with the Eagle Mountain-Saginaw Independent School District (hereinafter called “EMS ISD” or “District”) can be withdrawn, upon written request, prior to the time set for opening CSPs. A CSP may not be withdrawn after the CSPs have been opened, and the Proposer, by submitting a CSP, warrants and guarantees that the CSP has been carefully reviewed and checked and that is in all things true and accurate and free of mistakes.
- 2.1.2 CSPs cannot be altered or amended after opening time. Any alterations made before opening time must be initialed by proposer or his/her authorized agent.

2.2 CONSIDERATION OF CSP

- 2.2.1 **CSPs must be signed, sealed, and delivered to the Eagle Mountain-Saginaw Independent School District Purchasing Department office PRIOR TO the CSP due date and time. Unsigned, unsealed, or late CSPs will not be considered.** After CSPs are opened and publicly read aloud, the CSPs will be tabulated for comparison on the basis of the CSP prices and quantities shown in the CSP.
- 2.2.2 The Eagle Mountain-Saginaw Independent School District Board of Trustees reserves the right to reject any or all CSPs, to waive technicalities, and to re-advertise for new CSPs, or proceed to do the work otherwise in the best interests of the District.
- 2.2.3 CSPs received after the date and time specified **will not** be considered. The Purchasing Department will notify those firms submitting late CSPs and will hold documents for pick-up for five (5) business days following late CSP notification. **All late CSPs which are not picked up by the Proposer within five business days will be discarded.**

- 2.24 Any and all protests regarding EMS ISD proposal procedures will be governed by the Eagle Mountain-Saginaw Independent School District Procedure for Protests.

2.3 IRREGULAR CSP

CSPs will be considered irregular if they show any omissions, alterations of form, additions, or conditions not called for, unauthorized alternate CSPs, failure to return all forms and copies, or irregularities of any kind. However, the District reserves the right to waive any irregularities and to make the award in the best interests of the District.

2.4 REJECTION OF CSP

The District reserves the right to reject any or all CSPs, and all CSPs submitted are subject to this reservation. CSPs may be rejected, among other reasons, for any of the following specific reasons:

- A. CSP received after the time limit for receiving proposals as stated in the advertisement.
- B. CSP containing any irregularities.
- C. Unbalanced value of any items.
- D. Improper or insufficient CSP guaranty, if required.
- E. Where the Proposer, any Sub-contractor or Supplier, or the surety on any bond given, or to be given, is in litigation with the District or where such litigation is contemplated or imminent, in the sole opinion of the District.

2.5 DISQUALIFICATION OF PROPOSERS

Proposers may be disqualified and their CSPs not considered, among other reasons, for any of the following specific reasons:

- A. Reason for believing collusion exists among Proposers.
- B. Reasonable grounds for believing that any Proposer is interested in more than one CSP for the work contemplated.
- C. Where the Proposer, any Sub-contractor or Supplier, or the surety on any bond given, or to be given, is in litigation with the District or where such litigation is contemplated or imminent, in the sole opinion of the District.
- D. The Proposer being in arrears on any existing Contract or having defaulted on a previous Contract.
- E. Lack of competency as revealed by pertinent factors, including but not necessarily limited to experience and equipment, financial statement, and questionnaires.
- F. Uncompleted work that in the judgment of the District will prevent or hinder the prompt completion of additional work if awarded.
- G. Where the Proposer has failed to perform in a satisfactory manner on a previous Contract.

2.6 CONFIDENTIAL OR PROPRIETARY MARKINGS

Any portion of the CSP that Proposer considers confidential or proprietary information, or to contain trade secrets of Proposer, must be marked accordingly. This marking must be explicit as to the designated information. This designation may not necessarily guarantee the non-release of the information under the Public Information Act or as otherwise required by law, but does

provide the District with a means to review the issues thoroughly and, if justified, request an opinion by the Attorney General's office prior to releasing any information requested under the Public Information Act.

SECTION 3 – GENERAL TERMS AND CONDITIONS

3.1 TAX EXEMPT STATUS

The Eagle Mountain-Saginaw Independent School District is exempt from Federal Excise Tax. **DO NOT INCLUDE TAX IN CSP PRICES.** Excise Tax Exemption Certificate will be furnished upon request. EMS ISD Federal ID Number is 75-6004855.

3.2 RIGHT TO INSPECT AND AUDIT

The Contractor (and contractor's suppliers, vendors, sub-contractors, insurance agents, and other agents) shall maintain and the District shall have the right to examine records, documents, books, accounting procedures and practices and any other supporting evidence deemed necessary by the District to substantiate compliance with the terms of this agreement. Such right of examination shall include reasonable access to and cooperation by all Contractors personnel who have worked on or have knowledge related to the performance of this CSP. Proprietary/Trade Secret Information pertaining to this CSP may not be withheld from the District or its Authorized Representative.

3.3 CONTRACTOR RESPONSIBILITIES

The Contractor shall be fully responsible for the quality and accuracy of any and all Work performed in conjunction with the CSP. Neither acceptance of such Work by the District, nor payment, therefore, shall relieve the Contractor of this responsibility. If and when applicable, the Contractor shall complete all services in conformity with professional standards and shall provide qualified personnel to meet agreed upon schedules.

3.4 ASSIGNMENT

The successful Contractor may not assign its rights and duties under an award without the written consent of the Eagle Mountain-Saginaw Independent School District. Such consent shall not relieve the assignor of liability in the event of default by its assignee.

3.5 NON-APPROPRIATION CLAUSE

If for a fiscal year (September 1 through August 31) of this contract, the Board of Trustees, for any reason, fails to appropriate funds for these goods/services, the District will notify the contractor immediately and will no longer be obligated under the contract.

3.6 GRATUITIES

The District may, by written notice to the Contractor, cancel this CSP without liability to Contractor if it is determined by the District that gratuities, in the form of entertainment,

compensation, gifts, or otherwise, were offered or given by the Contractor, or any agent or representative of the Contractor, to any Board Member, officer, or employee of Eagle Mountain-Saginaw Independent School District, with a view toward securing a CSP or securing favorable treatment with respect to the awarding or amending, or the making of any determination with respect to the performing of such an agreement.

3.7 JURISDICTION

The Contract resulting from this CSP shall be enforceable in Tarrant County, Texas, and if legal action is necessary by either party with respect to the enforcement of any and all of its terms and conditions, exclusive venue for same shall lie in state courts in Tarrant County, Texas.

3.8 INDEMNIFICATION AND HOLD HARMLESS

The Contractor shall defend, indemnify, and hold harmless the Eagle Mountain-Saginaw Independent School District, all of its officers, agents and employees from and against all claims, actions, suits, demands, proceedings, costs, damages, and liabilities, arising out of, connected with, or resulting from any acts or omissions of Contractor or any agent, employee, sub-contractor, or supplier of Contractor in the execution or performance of this CSP.

SECTION 4 – CSP EVALUATION CRITERIA

- 4.1 In evaluating CSPs submitted and per Government Code 2269.055, the following considerations may be taken into account in determining the award.
1. The price;
 2. The offeror's experience and reputation;
 3. The quality of the offeror's goods or services;
 4. The impact on the ability of the District to comply with rules relating to historically underutilized businesses;
 5. The offeror's safety record;
 6. The offeror's proposed personnel;
 7. Whether the offeror's financial capability is appropriate to the size and scope of the project; and
 8. Any other relevant factor specifically listed in the request for bids, proposals, or qualifications.

FORM A**CSP RESPONSE FORM**

The undersigned, in submitting this CSP and endorsement of same, represents that he/she is authorized to obligate his/her firm, that he/she is an equal opportunity employer and will not discriminate with regard to race, color, religion, sex, national origin, age or disability unrelated to job performance of this CSP; that he/she will abide by all the policies and procedures of EMS ISD; and that he/she has read this entire CSP package, is aware of the covenants contained herein and will abide by and adhere to the expressed requirements in **ALL** sections of this CSP.

Failure to manually sign this CSP Response Form will be reason for the CSP to be rejected.

SUBMITTED BY:

Firm: _____
(OFFICIAL Firm Name)

***MUST BE SIGNED IN INK TO BE
CONSIDERED RESPONSIVE***

By:  _____
(Original Signature)

Name: _____
(Typed or Printed Name)

Title: _____
(Type or Printed Title) _____ (Date)

Contact
Representative: _____

Address: _____

City/ST/Zip: _____

Phone #: _____ Fax #: _____

Email: _____

Taxpayer Identification #: _____

***NOTE: Submit copy of Bidder's/
Proposer's current W-9 Form***

Prompt Payment Discount: _____ % _____ Days

I hereby acknowledge receipt of the following addenda which have been issued and incorporated into the CSP Document. *(Please initial in ink beside each addendum received. If none received, leave blank)*

Addendum No. 1 _____

Addendum No. 3 _____

Addendum No. 2 _____

Addendum No. 4 _____

FORM B**DEVIATION/COMPLIANCE SIGNATURE FORM**

If the undersigned Firm intends to deviate from the Specifications listed in this CSP document, all such deviations must be listed on this page, with complete and detailed conditions and information included or attached. The District will consider any deviations in its CSP award decisions, and the District reserves the right to accept or reject any CSP based upon any deviations indicated below or in any attachments or inclusions.

In the absence of any deviation entry on this form, the Firm assures the District of his/her full compliance with the Terms and Conditions, Specifications, and all other information contained in this CSP document.

☐ No Deviation

☐ Yes Deviations

Firm's Name: _____

Authorized Company Official's Name: _____
(Typed or printed)

Title of Authorized Representative: _____
(Typed or printed)

Signature of Authorized Company Official: _____

Date Signed: _____

If yes is checked, please list below. Attach additional sheet(s) if needed.

FORM C**NON-COLLUSION STATEMENT**

“The undersigned affirms that he/she is duly authorized to execute this CSP, that this company, corporation, firm, partnership or individual has not prepared this CSP in collusion with any other proposer, and that the contents of this CSP as to prices, terms or conditions of said CSP have not been communicated by the undersigned nor by any employee or agent to any other person engaged in this type of business prior to the official opening of this CSP.”

Firm's Name: _____

Authorized Company Official's Name: _____
(*Typed or printed*)

Title of Authorized Representative: _____
(*Typed or printed*)

Signature of Authorized Company Official: _____

Date Signed: _____

Firm hereby assigns to purchaser any and all claims for overcharges associated with this CSP which arise under the antitrust laws of the United States, 15 USCA Section 1 and which arise under the antitrust laws of the State of Texas, Business and Commerce Code, Section 15.01.

FORM D**CRIMINAL BACKGROUND CHECK AND FELONY CONVICTION NOTIFICATION****(a) CRIMINAL BACKGROUND CHECK**

Firm will obtain history record information that relates to an employee, applicant for employment, or agent of the Firm if the employee, applicant, or agent has or will have continuing duties related to the contracted services; and the duties are or will be performed on school property or at another location where students are regularly present. The Firm certifies to the EMS ISD before beginning work and at no less than an annual basis thereafter that criminal history record information has been obtained. Firm shall assume all expenses associated with the background checks, and shall immediately remove any employee or agent who was convicted of a felony, or misdemeanor involving moral turpitude, as defined by Texas law, from EMS ISD's property or other location where students are regularly present. EMS ISD shall be the final decider of what constitutes a "location where students are regularly present." Firm's violation of this section shall constitute a material breach and default.

(b) FELONY CONVICTION NOTIFICATION

Texas Education Code, Section 44.034, Notification of Criminal History, Subsection (a), states, "a person or business entity that enters into a contract with a school district must give advance notice to the District if the person or owner or operator of the business entity has been convicted of a felony." The notice must include a general description of the conduct resulting in the conviction of a felony.

Subsection (b) states, "a school district may terminate a contract with a person or business entity if the district determines that the person or business entity failed to give notice as required by Subsection (a) or misrepresented the conduct resulting in the conviction." The district must compensate the person or business entity for services performed before the termination of the contract.

THE FELONY CONVICTION NOTICE IS NOT REQUIRED OF A PUBLICLY HELD CORPORATION.

I, the undersigned agent for the firm named below, certify that the information concerning criminal background check and notification of felony convictions has been reviewed by me, the following information furnished is true to the best of my knowledge, and I acknowledge compliance with this section.

Firm's Name: _____

Authorized Company Official's Name: _____
(please print clearly or type)

- My firm is a publicly held corporation; therefore, this reporting requirement is not applicable:

Signature of Company Official: _____ Date: _____

- My firm is not owned nor operated by anyone who has been convicted of a felony.

Signature of Company Official: _____ Date: _____

- My firm is owned or operated by the following individual(s) who has/have been convicted of a felony:

Name of Felon(s): _____

Details of Conviction(s): _____

Signature of Company Official: _____ Date: _____

FORM D – CONTINUES ON NEXT PAGE ...

PAGE 1/2

Firm is responsible for the performance of the persons, employees and/or sub-contractors that the Firm assigns to provide services for the Eagle Mountain-Saginaw ISD pursuant to this CSP on all Eagle Mountain-Saginaw ISD campuses or facilities. Firm will not assign individuals to provide services at an Eagle Mountain-Saginaw ISD campus or facility who have a history of violent, unacceptable, or grossly negligent behavior or who have a felony conviction, without the prior written consent of the Eagle Mountain-Saginaw ISD Purchasing Department.

NONRESIDENT BIDDER'S CERTIFICATION

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FORM F**COMPLIANCE CERTIFICATION FORM****ISRAEL BOYCOT**

Pursuant to Texas Government Code Ann. Chapter 2271, as amended, if Contractor is a for-profit organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company, or affiliate of those entities or business associations (specifically excluding sole proprietorships) that exists to make a profit, has ten (10) or more full-time employees, and the value of the contract with Owner is \$100,000 or more, Contractor certifies to the EMS ISD, by submitting a proposal or signing a contract with the District, that the Contractor does not boycott Israel and will not boycott Israel during the term of this Agreement.

TERRORIST ORGANIZATIONS

Pursuant to Texas Government Code Ann. Chapter 2252, contractor verifies and affirms that it is not a foreign terrorist organization as identified on the list prepared and maintained by the Texas Comptroller of Public Accounts. If Contractor has misrepresented its inclusion on the Comptroller's list, such omission or misrepresentation will void this Contract.

ABORTION PROVIDERS

Pursuant to Texas Government Code Ann. Chapter 2272, by submitting a proposal and entering a contract with EMS ISD on such proposal, the Contractor verifies by its signature below that it is not an abortion provider or an affiliate of abortion providers, whereby the provider or affiliate receives something of value derived from state or local tax revenue. Any contract entered into by the District is void if the Contractor has such a prohibited affiliation or contractual relationship.

ENERGY COMPANY BOYCOTT

As required by Texas Government Code Ann. Chapter 2274, if Contractor has ten (10) or more employees, is not a sole proprietorship, and if the value of Contractor's proposal has a value of \$100,000 or more, Contractor certifies by submitting Contractor's proposal that it does not boycott energy companies and will not during the term of any contract with the District, unless excepted by that law.

FIREARM ENTITY/TRADE ASSOCIATION NONDISCRIMINATION

If Contractor is not a sole proprietorship, has ten (10) or more employees, and the value of Contractor's proposal has a value of \$100,000 or more, Contractor certifies by submitting Contractor's proposal that it does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association, as defined by Texas Government Code Ann. Chapter 2274, and will not during the term of any contract with the District, unless excepted from that law.

CERTIFICATE OF INTERESTED PARTIES

EMS ISD may not enter into certain contracts with a business entity unless the business entity submits a disclosure of interested parties to the District at the time the Contractor submits the signed contract. Additional information is available on the Texas Ethics Commission website at <https://www.ethics.state.tx.us/filinginfo/1295/>. If the contractor fails to submit to the District the required

FORM F – CONTINUES ON NEXT PAGE ...

PAGE 1/2

FORM F – CONTINUED

PAGE 2/2

disclosure of interested parties on or before the 10th business day after the day the contractor receives written notice by the District, the contract will be void.

The undersigned acknowledges that if awarded this contract they will comply with all the requirements stated in this Compliance Certification Form (Form F).

Firm's Name: _____

Name of Authorized Company Official: _____
(*Typed or printed*)

Title of Authorized Company Official: _____
(*Typed or printed*)

Signature of Authorized Company Official: _____

Date Signed: _____

FORM G**CONFLICT OF INTEREST QUESTIONNAIRE -FORM CIQ**

CONFLICT OF INTEREST QUESTIONNAIRE For vendor doing business with local governmental entity		FORM CIQ
<p>This questionnaire reflects changes made to the law by H.B. 23, 84th Leg., Regular Session.</p> <p>This questionnaire is being filed in accordance with Chapter 176, Local Government Code, by a vendor who has a business relationship as defined by Section 176.001(1-a) with a local governmental entity and the vendor meets requirements under Section 176.006(a).</p> <p>By law this questionnaire must be filed with the records administrator of the local governmental entity not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Local Government Code.</p> <p>A vendor commits an offense if the vendor knowingly violates Section 176.006, Local Government Code. An offense under this section is a misdemeanor.</p>	OFFICE USE ONLY <hr/> Date Received	
1 Name of vendor who has a business relationship with local governmental entity. 		
2 <input type="checkbox"/> Check this box if you are filing an update to a previously filed questionnaire. (The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than the 7th business day after the date on which you became aware that the originally filed questionnaire was incomplete or inaccurate.)		
3 Name of local government officer about whom the information is being disclosed. <div style="text-align: center;">_____</div> <div style="text-align: center;">Name of Officer</div>		
4 Describe each employment or other business relationship with the local government officer, or a family member of the officer, as described by Section 176.003(a)(2)(A). Also describe any family relationship with the local government officer. Complete subparts A and B for each employment or business relationship described. Attach additional pages to this Form CIQ as necessary. <div style="margin-top: 20px;"> A. Is the local government officer or a family member of the officer receiving or likely to receive taxable income, other than investment income, from the vendor? <div style="display: flex; justify-content: center; gap: 50px; margin-top: 10px;"> <input type="checkbox"/> Yes <input type="checkbox"/> No </div> </div> <div style="margin-top: 20px;"> B. Is the vendor receiving or likely to receive taxable income, other than investment income, from or at the direction of the local government officer or a family member of the officer AND the taxable income is not received from the local governmental entity? <div style="display: flex; justify-content: center; gap: 50px; margin-top: 10px;"> <input type="checkbox"/> Yes <input type="checkbox"/> No </div> </div>		
5 Describe each employment or business relationship that the vendor named in Section 1 maintains with a corporation or other business entity with respect to which the local government officer serves as an officer or director, or holds an ownership interest of one percent or more. 		
6 <input type="checkbox"/> Check this box if the vendor has given the local government officer or a family member of the officer one or more gifts as described in Section 176.003(a)(2)(B), excluding gifts described in Section 176.003(a-1).		
7 <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="width: 60%;"> <div style="text-align: center;">_____</div> <div style="text-align: center;">Signature of vendor doing business with the governmental entity</div> </div> <div style="width: 35%;"> <div style="text-align: center;">_____</div> <div style="text-align: center;">Date</div> </div> </div>		

FORM H**NOTIFICATION OF HAZARDOUS MATERIALS AFFIDAVIT**

STATE OF TEXAS

_____ COUNTY

Before me, undersigned authority on this day personally appeared _____, _____ known to me to be the person whose name is subscribed below, who, on oath stated:

"As the appropriate official of the company, contractor, or subcontractor submitting this affidavit in conjunction with a bid submitted to the Eagle Mountain-Saginaw ISD, I acknowledge that this company, contractor, or subcontractor has been notified that copies of the Asbestos Hazard Emergency Response Act (AHERA) for the school(s) where such company, contractor or subcontractor has been contracted to perform work are available at the Eagle Mountain-Saginaw ISD, Fort Worth, Texas. I understand that it is our responsibility to familiarize ourselves with such plans and that it is our responsibility to inform every worker that we use on this project as to the availability of these plans.

We also acknowledge that we will be required to obtain clearance from the Eagle Mountain-Saginaw ISD, prior to executing any work on this project."

Name of Company: _____

By: _____

Title: _____

STATE OF TEXAS

COUNTY OF _____

Sworn to and subscribed before my hand at _____, Texas this the _____ day of _____, 20____, A.D.

Notary Public in and for _____ County, Texas

DOCUMENT 00 42 00

PROPOSAL FORM – BASE PROPOSAL

DICK AND HEIDI ELKINS AGRICULTURAL SCIENCE FACILITY
 EAGLE MOUNTAIN-SAGINAW ISD
 FORT WORTH, TEXAS

PROPOSAL OF:

(Name)

(Date)

TO: Taylor Shaw
 Director of Purchasing
 Eagle Mountain-Saginaw Independent School District
 1600 Mustang Rock Rd
 Fort Worth, Texas 76179

Dear Madam:

Having examined the drawings, project manual, and related documents and having inspected the site of proposed Work, I (we) agree to furnish all labor, materials, and to perform all work described in the specifications and shown on the drawings for the sum of:

BASE PROPOSAL; For complete construction, including General, Mechanical, Fire Protection, and Electrical Work, for the sum of:

_____ DOLLARS

(\$_____).

ALLOWANCES: The above base proposal includes all allowances listed in *Section 01 21 00 - Allowances*.

The undersigned agrees, if this proposal is accepted, to commence work on or before a date to be established in the written "Notice-to-Proceed" of the Owner and to attain substantial completion of all Work by August 3, 2026, subject to extensions of time as described in General Conditions of the AIA project contract.

The undersigned further agrees that, from the compensation otherwise to be paid, the Owner may retain the sum of \$500.00 for each calendar day after the Substantial Completion date that the Work remains incomplete, which sum is agreed upon as the proper measure of liquidated damages which the Owner will sustain per diem by the failure of the undersigned to complete the Work at the time stipulated in the contract. Damages for failure to achieve Substantial Completion and failure to achieve Final Completion may run concurrently. These sums are not to be construed in any sense a penalty.

I (we) acknowledge receipt of the following addenda:

Addendum No. 1 Dated _____

Addendum No. 2 Dated _____

Addendum No. 3 Dated _____

Addendum No. 4 Dated _____

Upon receipt of notice of acceptance of this proposal within 60 days after the opening of proposals, I (we) agree to execute formal contract forms, acceptable surety bonds, and required insurance certificates within 10 days of the Notice of Award of the Contract.

Should I (we) fail to execute and deliver the Contract, along with the satisfactory surety bonds and insurance certification within the time set forth, the proposal security, attached hereto without endorsement, in the sum of:

_____ DOLLARS (\$_____).

shall become the property of Eagle Mountain-Saginaw Independent School District as liquidated damages for the delay caused and the additional work required.

Respectfully submitted, (Signature)

By (Please Print or Type)

Title

Contractor

Business Address

Telephone Number

FAX Number

ATTEST:

Secretary

Indicate whether - Individual
Partnership
Corporation

END OF PROPOSAL FORM – BASE PROPOSAL

DOCUMENT 00 43 00

PROPOSAL FORM – QUALIFICATIONS

DICK AND HEIDI ELKINS AGRICULTURAL SCIENCE FACILITY
EAGLE MOUNTAIN-SAGINAW ISD
FORT WORTH, TEXAS

PROPOSAL OF: _____
(Name) (Date)

TO: Taylor Shaw
Director of Purchasing
Eagle Mountain-Saginaw Independent School District
1600 Mustang Rock Rd., Fort Worth, TX 76179

THE CONTRACTOR SHALL PROVIDE THE FOLLOWING INFORMATION IN THE SEQUENCE AND FORMAT PRESCRIBED HEREIN AND AS OUTLINED IN SECTION 00 21 16 – INSTRUCTIONS TO PROPOSERS, PROVIDING ADDITIONAL INFORMATION MAY BE ATTACHED, BUT THE INFORMATION REQUESTED BELOW IS TO BE PROVIDED IN THIS FORMAT AND TABBED AS NOTED.

TAB 1: FIRM INFORMATION

Name and Firm: _____

Address of Principal Office: _____

Phone Number: _____

Fax Number: _____

Email Address and/or Web Address: _____

Form of Business Organization (Corporation, Partnership, Limited Liability Partnership, Individual, Joint Venture, other): _____

Year Founded: _____

Primary Individual to Contact: _____

TAB 2: SCHEDULE

The Proposer shall submit a schedule for this project. State your organization's project plan or proposed approach to this project. If selected, this proposed schedule shall become part of the Owner- Contractor Agreement, AIA Document A101-2017 under Article 9.1.7.

TAB 3: KEY PROJECT PERSONNEL

Given the scope and schedule of the project, identify all proposed personnel for this project including but not limited to the Project Manager, Estimator, and Superintendent who would work on the project. Provide a resume and references for each individual. Note current projects on which individual is working including the project name, location, contract amount, percent complete, and the completion date of those projects. Also note the length of tenure with your company (hire date) for each proposed individual. Provide an organizational chart for this project noting whether the individual is On Site or Off Site. This organizational chart shall become part of the Owner-Contractor Agreement, AIA Document A101-2017 under Article 9.1.7. Members of the proposed team, once approved, shall not be changed without prior written approval of the Owner.

TAB 4: PAST RELATIONSHIP/HISTORY WITH DISTRICT

Provide a list of all the major subcontractors and Suppliers for each category listed below for this project.

<ul style="list-style-type: none"> • Earthwork • Concrete • Masonry • Millwork/Casework • Waterproofing • Door Hardware • Drywall • Ceramic Tile/Quarry Tile • Painting • Metal Building System • Plumbing • HVAC Controls • Technology • Security • Synthetic Turf and/or Running Tracks 	<ul style="list-style-type: none"> • Site Utilities • Insulating Concrete Forms • Steel Fabrication • Roofing • Glass and Glazing • Door Access Control • Resilient Floor Covering/Carpet • Terrazzo Flooring • Stage/Theatrical • Sprinkler System • Mechanical (HVAC) • Electrical • Fire Alarm • Public Address • Landscape and Irrigation
--	--

You may provide a maximum of three (3) proposed sub-contractors for each category. However, no additional sub-contractors will be considered after submission of this list.

Provide a resume and references for each firm and previous experience with the General Contractor. Only two (2) copies of the resumes are required. Provide resumes in a separate binder.

TAB 5: PROJECT EXPERIENCE

List all educational projects and all other major projects constructed by your firm within the last

five (5) years in similar scope and size to the project herein. For each project provide the name of the project; nature of the project/function of the building; size (square feet); locations; cost; completion date; name and contact person, address and phone number of both the Owner and Architect; and the manner in which your organization was selected (Bid, RFP, CM or other method).

TAB 6: FINANCIAL BACKGROUND

Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

1. Current assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory, and prepaid expenses).
2. Non-current assets (e.g., net fixed assets, other assets).
3. Current liabilities (e.g., accounts payable, notes payable (current), accrued expenses, provision for income taxes, advances, accrued salaries, and accrued payroll taxes).
4. Non-current liabilities (e.g., notes payable).
5. Capital accounts and retained earnings (e.g., capital, capital stock, authorized and outstanding shares par value, earned surplus and retained earnings).

Name and address of firm preparing attached financial statement and date thereof.

Is the attached financial statement for the identical organization named under item 1 above? If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent, and subsidiary).

Provide name, address, phone for bank reference.

Surety: Name of bonding company, name, and address of agent. State total bonding capacity and total current bonding obligations with and without this project.

Please note that this information will be reviewed by the Owners Financial Officer or Consultant acting in that capacity.

TAB 7: CLAIMS AND SUITS

List all lawsuits, requested arbitration and mediation with regard to construction contracts in the last ten (10) years.

List all judgments, claims, arbitration proceedings, mediation or suits pending or anticipated against your organization.

If your company has been in business less than ten (10) years, then include any former company information if applicable.

TAB 8: QUALITY PROGRAM

State your organization's overall approach to quality control for this project.

TAB 9: PROJECT APPROACH

What are your organization's creative solutions for navigating costs in a volatile market?

DOCUMENT 00 43 93

CSP RESPONSE CHECKLIST

To be considered a responsive CSP, all pages requiring signature (including but not limited to the forms listed below) must be completed with all requested information, **SIGNED** and **RETURNED** sealed in an envelope or other appropriate package adequate to conceal and contain the contents prior to the CSP date and time.

Please verify that the documents listed below have been completed, signed, and included in your CSP prior to submittal. **FAILURE TO RETURN THESE DOCUMENTS MAY CAUSE YOUR CSP TO BE REJECTED.**

PART A

- ☐ Completed – Cover Page (page 1)
- ☐ Completed – Proposal Form Base Proposal
- ☐ Bid Bond or Bid Security
- ☐ Completed – CSP Response Form – Form A
- ☐ Completed – Deviation/Compliance – Form B
- ☐ Completed – Non-Collusion Statement – Form C
- ☐ Completed – Criminal Background Check and Felony Conviction Notification – Form D
- ☐ Completed – Nonresident Bidder's Certification – Form E
- ☐ Completed – Compliance Certification Form – Form F
- ☐ Completed – Conflict of Interest Questionnaire – Form G
- ☐ Completed – Notification of Hazardous Materials Affidavit – Form H
- ☐ Any and all attachments as required in the CSP document
- ☐ W-9

PART B

- ☐ Completed – Proposal Form Qualifications
- ☐ Completed – Contractor's Qualifications Statement
- ☐ AIA Document A305-1986

DOCUMENT 00 31 32

GEOTECHNICAL DATA

PART 1 - GENERAL

1.1 LOG OF BORINGS/CONTRACTOR RESPONSIBILITY

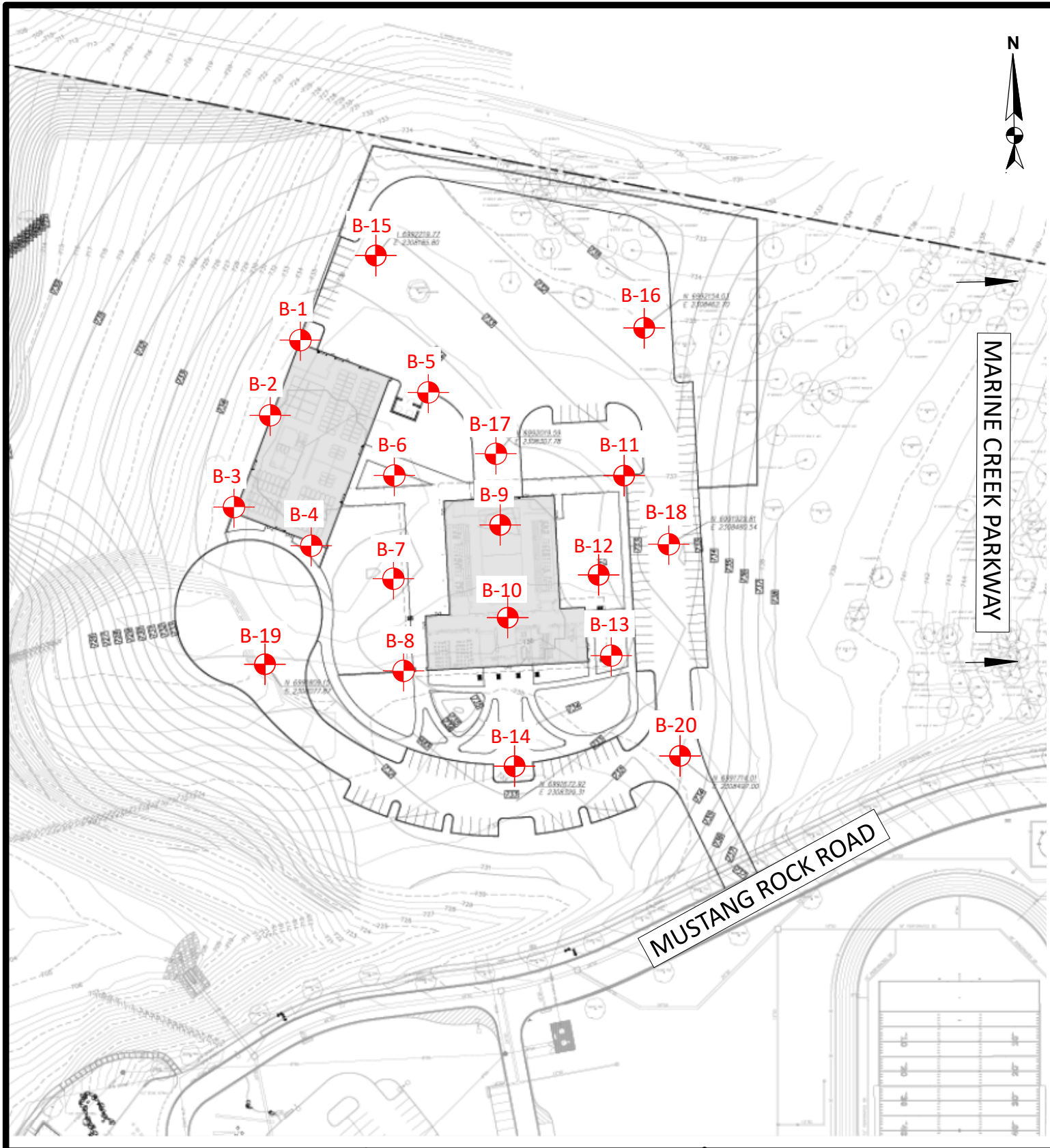
- A. A copy of the locations and log of borings is bound herein.
- B. Subsurface soil data derived from test borings are given only for the convenience of the Contractor, and neither the Owner nor the Architect assumes responsibility for the accuracy of or for the Contractor's interpretation of the data.
- C. Contractor is responsible for any conclusions drawn from the boring data and is responsible for the work without extra compensation irrespective of whether or not the subsurface conditions encountered agree with the boring data.

1.2 REPORT

- A. The full geotechnical report prepared by the Owner's independent geotechnical and testing laboratory is available in the Architect's office for inspection by the Contractor.
- B. This geotechnical report is not a part of the Contract Documents.

END OF DOCUMENT

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GEOTECHNICAL EXPLORATION
SHOW ARENA AND AG BARN
OFF MARINE CREEK PARKWAY AND
MUSTANG ROCK ROAD
FORT WORTH, TEXAS
UES PROJECT NO. W251074



FIGURE 1
BORING LOCATION PLAN



APPROXIMATE BORING LOCATION

B-1 METHODS OF LABORATORY TESTING

Representative samples were evaluated and classified by a qualified member of the Geotechnical Division and the boring logs were edited as necessary. To aid in classifying the subsurface materials and to determine the general engineering characteristics, natural moisture content tests (ASTM D 2216), Atterberg-limit tests (ASTM D 4318), and percent material passing the No. 200 sieve tests (ASTM D 1140) and dry unit weight determinations were conducted on selected samples. In addition, unconfined compressive strength tests (ASTM D 2166) and pocket-penetrometer tests were conducted on selected soil samples to evaluate the soil shear strength. Results of these laboratory tests are provided on the Log of Boring sheets.

In addition to the Atterberg-limit tests, the expansive properties of the clayey soils were further analyzed by absorption swell tests. The swell test is performed by placing a selected sample in a consolidation machine and applying either the approximate current or expected overburden pressure and then allowing the sample to absorb water. When the sample exhibits very little tendency for further expansion, the height increase is recorded and the percent free swell and total moisture gain calculated. Results of the absorption swell tests are provided on the attached Log of Boring sheets.

PROJECT NAME Show Arena and Ag Barn

PROJECT NUMBER W251074

DATE STARTED 03/11/2025 **COMPLETED** 03/11/2025

PROJECT LOCATION Fort Worth, Texas



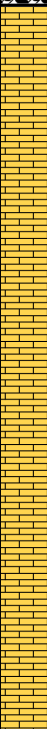











CLIENT Eagle Mountain - Saginaw ISD

NORTHING/EASTING - / - **DRILLING METHOD** Auger

BORING ELEVATION N/A



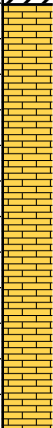
























NOTES -

HAMMER WEIGHT 140 **HAMMER DROP** 30

Depth (ft)	Graphic Log	<table><tr><th colspan="2">Groundwater Data</th></tr><tr><td>During Drilling (ft):</td><td>N/A</td></tr><tr><td>After Drilling (ft):</td><td>N/A</td></tr><tr><td>After __ Hours (ft):</td><td>N/A</td></tr></table>	Groundwater Data		During Drilling (ft):	N/A	After Drilling (ft):	N/A	After __ Hours (ft):	N/A	Samples				Lab									
			Groundwater Data																					
During Drilling (ft):	N/A																							
After Drilling (ft):	N/A																							
After __ Hours (ft):	N/A																							
		Material Description	Sample Graphic	REC (%) / RQD (%)	N-Value / Refusal / TCP	Pocket Pen (TSF)	Compressive Strength (TSF)	Confining Pressure (PSI)	Dry Density (PCF)	Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Swell	% Fines	Sulfate (PPM)								
		CLAYEY GRAVEL (GC) - brown			100/5"					5														
		LIMESTONE - tan. - with intermediate shale seams at 6 ft																						
5					100/1"						4													
																								
						100/1.5"					9													
10						100/1"					14													
																								
15						100/0.5"					9													
																								
20							100/0"				6													
																								
25					100/1"					5														
Boring terminated at 25'																								

BORING NUMBER: B-2

Depth (ft)	Graphic Log	Groundwater Data		Samples				Lab									
		During Drilling (ft):	N/A	Sample Graphic	REC (%) / RQD (%)	N-Value / Refusal / TCP	Pocket Pen (TSF)	Compressive Strength (TSF)	Confining Pressure (PSI)	Dry Density (PCF)	Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Swell	% Fines	Sulfate (PPM)
		Material Description															
		GRAVELLY CLAY - brown, possible fill									8						
		2.0															
		CLAY WITH GRAVEL - tan, and calcareous nodules					3.0				20	51	18	33	0.0		
		4.0															
5		LIMESTONE - tan.			100/1.5"						5						
					100/1"						3						
					100/0.5"						8						
10					100/1.5"						10						
		15.0			100/1"						5						
		LIMESTONE - gray.			100/0.5"						4						
20					100/1"						5						
					100/0.5"												
25					100/1"												
					100/1"												
30					100/1"												
		35.0			100/1"						5						
35	Boring terminated at 35'																

Depth (ft)	Graphic Log	Groundwater Data		Samples				Lab										
		During Drilling (ft):		Sample Graphic	REC (%) / RQD (%)	N-Value / Refusal / TCP	Pocket Pen (TSF)	Compressive Strength (TSF)	Confining Pressure (PSI)	Dry Density (PCF)	Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Swell	% Fines	Sulfate (PPM)	
		After Drilling (ft):																
		After __ Hours (ft):																
Material Description																		
		CLAY WITH GRAVEL - brown					2.0				21	54	19	35				
		LIMESTONE - tan.				100/1"												
5						100/1.5"												
																		
						100/1"												
																		
10		- with intermediate shale seams at 9 ft				100/1"												
																		
																		
																		
15		LIMESTONE - gray.				100/1"												
																		
																		
20					100/1"													
																		
																		
25					100/1"													
																		
																		
																		
30					100/1"													
																		
																		
																		
35					100/1"													
Boring terminated at 35'																		



BORING NUMBER: B-10

Page 1 of 1

PROJECT NAME Show Arena and Ag Barn

PROJECT NUMBER W251074

DATE STARTED 03/10/2025 **COMPLETED** 03/10/2025

PROJECT LOCATION Fort Worth, Texas

CLIENT Eagle Mountain - Saginaw ISD



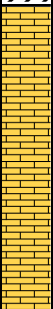









































NORTHING/EASTING - / -

DRILLING METHOD Auger

BORING ELEVATION N/A

NOTES -

HAMMER WEIGHT 140 **HAMMER DROP** 30

Depth (ft)	Graphic Log	Groundwater Data		Samples				Lab										
		During Drilling (ft):		Sample Graphic	REC (%) / RQD (%)	N-Value / Refusal / TCP	Pocket Pen (TSF)	Compressive Strength (TSF)	Confining Pressure (PSI)	Dry Density (PCF)	Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Swell	% Fines	Sulfate (PPM)	
		N/A																
		After Drilling (ft):																
		After __ Hours (ft):																
		N/A																
		Material Description																
		CLAY WITH GRAVEL - brown					1.0	1.8		91	24	53	19	34				
		LIMESTONE - tan.				100/1.5"					6							
5											4							
						100/1.5"					7							
																		
10		- with intermediate shale seams at 8 ft				100/1"					7							
																		
		LIMESTONE - gray.				100/1"					8							
15																		
						100/0.5"					4							
20																		
						100/0.5"					4							
25																		
						100/1"					4							
30																		
						100/0.5"					4							
35																		
						100/1"												
40																		
						100/0.5"					4							
45																		
						100/1"					4							
		Boring terminated at 45'																

Depth (ft)	Graphic Log	Groundwater Data		Samples				Lab									
		During Drilling (ft):	N/A	Sample Graphic	REC (%) / RQD (%)	N-Value / Refusal / TCP	Pocket Pen (TSF)	Compressive Strength (TSF)	Confining Pressure (PSI)	Dry Density (PCF)	Moisture Content (%)	Liquid Limit	Plastic Limit	Plasticity Index	% Swell	% Fines	Sulfate (PPM)
		After Drilling (ft):															
		After __ Hours (ft):															
		Material Description															
		CLAY WITH GRAVEL - brown					3.5			22	46	19	27				
		LIMESTONE - tan.				100/1.5"				9							
5						100/1"				7							
						100/2.5"				7							
10						100/1.5"				8							
		LIMESTONE - gray. - with intermediate shale seams at 12 ft															
15						100/1"				7							
						100/1"				6							
20																	
						100/1"				7							
25																	
						100/1.5"				7							
30																	
						100/1"											
35		Boring terminated at 35'				100/1"				7							

Page 1 of 1

Page 1 of 1

DOCUMENT 00 61 13.13

PERFORMANCE BOND FORM **Bond No.:** _____
(Penalty of this bond must be 100% of contract amount)

KNOW ALL MEN BY THESE PRESENTS, that: _____
(hereinafter called the Principal), as principal, and
a corporation organized and existing under the laws of the State of _____ authorized and admitted to
do business in the State of Texas and licensed by the State of Texas to execute bonds as Surety (hereinafter called the Surety), as
Surety, are held and firmly bound unto

(hereinafter called the Obligee) in the amount of _____

Dollars(\$ _____) for the payment whereof, the said Principal and Surety bind themselves, and their heirs,
administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Obligee, dated this _____ day of
_____, _____.

**EMS ISD AGRICULTURAL SCIENCE COMPLEX
EAGLE MOUNTAIN-SAGINAW ISD
FORT WORTH, TEXAS**

which contract is hereby referred to and made a part hereof as fully and the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall faithfully perform
the work in accordance with the plans, specifications and contract documents, then this obligation shall be void; otherwise to
remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Chapter 22.53 of the Texas Government Code
and all liabilities on this bond shall be determined in accordance with the provisions of said Chapter to the same extent as if it
were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this Instrument this _____ day of
_____, _____.

Principal (Seal)

By: _____
Surety Address

Surety Telephone Number

Surety (Seal)

By: _____
Attorney-in-Fact

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DOCUMENT 00 61 13.16

PAYMENT BOND FORM

Bond No.: _____

(Penalty of this bond must be 100% of contract amount)

KNOW ALL MEN BY THESE PRESENTS, that: _____
(hereinafter called the Principal), as principal,
a corporation organized and existing under the laws of the State of _____ authorized and admitted to
do business in the State of Texas and licensed by the State of Texas to execute bonds as Surety (hereinafter called the Surety), as
Surety, are held and firmly bound unto

(hereinafter called the Obligee) in the amount of _____

Dollars(\$ _____) for the payment whereof, the said Principal and Surety bind themselves, and their heirs,
administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written contract with the Obligee, dated this _____ day of
_____, _____.

EMS ISD AGRICULTURAL SCIENCE COMPLEX
EAGLE MOUNTAIN-SAGINAW ISD
FORT WORTH, TEXAS

which contract is hereby referred to and made a part hereof as fully and the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall pay all claimants
supplying labor and material to him or a Subcontractor in the prosecution of the work provided for in said contract, then this
obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Chapter 22.53 of the Texas Government Code
and all liabilities on this bond to all such claimants shall be determined in accordance with the provisions of said Chapter to the
same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this Instrument this _____ day of
_____, _____.

Witness: _____ (Seal)
Principal

By: _____

Witness: _____ (Seal)
Surety

By: _____
Attorney-in-Fact

Surety Address _____ Surety Telephone Number _____

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DOCUMENT 00 65 00

RELEASE OF LIEN DOCUMENTS

APPENDIX INDEX:

1. **CONDITIONAL WAIVER FOR PROGRESS PAYMENTS**
2. **UNCONDITIONAL WAIVER FOR PROGRESS PAYMENTS**
3. **CONDITIONAL WAIVER FOR FINAL PAYMENT**
4. **UNCONDITIONAL WAIVER FOR FINAL PAYMENT**

[Note: the attached forms are duplicated *verbatim* (without editing) from HB 1456.]

FORM 1: CONDITIONAL WAIVER FOR PROGRESS PAYMENTS

* * * * *

CONDITIONAL WAIVER AND RELEASE ON PROGRESS PAYMENT

Project: _____

Job No.: _____

On receipt by the signer of this document of a check from _____

(maker of check) in the sum of \$ _____
payable to _____

(payee or payees of check) and when the check has been properly endorsed and has been paid by the bank on which it is drawn, this document becomes effective to release any mechanic's lien right, any right arising from a payment bond that complies with a state or federal statute, any common law payment bond right, any claim for payment, and any rights under any similar ordinance, rule, or statute related to claim or payment rights for persons in the signer's position that the signer has on the property of _____

(owner) located at (location) to the following extent: _____

(job description).

This release covers a progress payment for all labor, services, equipment, or materials furnished to the property or to _____
(person with whom signer contracted) as indicated in the attached statement(s) or progress payment request(s), except for unpaid retention, pending modifications and changes, or other items furnished.

Before any recipient of this document relies on this document, the recipient should verify evidence of payment to the signer.

The signer warrants that the signer has already paid or will use the funds received from this progress payment to promptly pay in full all of the signer's laborers, subcontractors, materialmen, and suppliers for all work, materials, equipment, or services provided for or to the above referenced project in regard to the attached statement(s) or progress payment request(s).

Date: _____

(Company name)

By _____ (Signature)

(Title)

FORM 2: UNCONDITIONAL WAIVER FOR PROGRESS PAYMENTS

* * * * *

NOTICE: THIS DOCUMENT WAIVES RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. IT IS PROHIBITED FOR A PERSON TO REQUIRE YOU TO SIGN THIS DOCUMENT IF YOU HAVE NOT BEEN PAID THE PAYMENT AMOUNT SET FORTH BELOW. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL RELEASE FORM.

UNCONDITIONAL WAIVER AND RELEASE ON PROGRESS PAYMENT

Project:

Job No.:

The signer of this document has been paid and has received a progress payment in the sum of \$ _____ for all labor, services, equipment, or materials furnished to the property or to _____ (person with whom signer contracted) on the property of _____ (owner) located at _____ (location) to the following extent: _____

_____ (job description). The signer therefore waives and releases any mechanic's lien right, any right arising from a payment bond that complies with a state or federal statute, any common law payment bond right, any claim for payment, and any rights under any similar ordinance, rule, or statute related to claim or payment rights for persons in the signer's position that the signer has on the above referenced project to the following extent: _____

This release covers a progress payment for all labor, services, equipment, or materials furnished to the property or to _____ (person with whom signer contracted) as indicated in the attached statement(s) or progress payment request(s), except for unpaid retention, pending modifications and changes, or other items furnished.

The signer warrants that the signer has already paid or will use the funds received from this progress payment to promptly pay in **full** all of the signer's laborers, subcontractors, materialmen, and suppliers for all work, materials, equipment, or services provided for or to the above referenced project in regard to the attached statement(s) or progress payment request(s).

Date: _____

_____(Company name)

By _____(Signature)

_____(Title)

FORM 3: CONDITIONAL WAIVER FOR FINAL PAYMENT

* * * * *

CONDITIONAL WAIVER AND RELEASE ON FINAL PAYMENT

Project:

Job No.:

On receipt by the signer of this document of a check from _____

_____ (maker of check) in the sum of
\$ _____ payable to

_____ (payee or payees of check) and when the check has been properly
endorsed and has been paid by the bank on which it is drawn, this document becomes effective to
release any mechanic's lien right, any right arising from a payment bond that complies with a state or
federal statute, any common law payment bond right, any claim for payment, and any rights under any
similar ordinance, rule, or statute related to claim or payment rights for persons in the signer's
position that the signer has on the property of _____

_____ (owner) located at _____

_____ (location) to the following extent: _____

_____ (job description).

This release covers the final payment to the signer for all labor, services, equipment, or materials
furnished to the property or to _____
(person with whom signer contracted).

Before any recipient of this document relies on this document, the recipient should verify evidence of
payment to the signer.

The signer warrants that the signer has already paid or will use the funds received from this final
payment to promptly pay in full all of the signer's laborers, subcontractors, materialmen, and suppliers
for all work, materials, equipment, or services provided for or to the above referenced project up to
the date of this waiver and release.

Date: _____

_____ (Company name)

By _____ (Signature)

_____ (Title)

FORM 4: UNCONDITIONAL WAIVER FOR FINAL PAYMENT

* * * * *

NOTICE: THIS DOCUMENT WAIVES RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. IT IS PROHIBITED FOR A PERSON TO REQUIRE YOU TO SIGN THIS DOCUMENT IF YOU HAVE NOT BEEN PAID THE PAYMENT AMOUNT SET FORTH BELOW. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL RELEASE FORM.

UNCONDITIONAL WAIVER AND RELEASE ON FINAL PAYMENT

Project: _____

Job No.: _____

The signer of this document has been paid in full for all labor, services, equipment, or materials furnished to the property or to _____

_____ (person with whom signer contracted) on the property of _____

_____ (owner) located at _____

_____ (location) to the following extent _____

: _____ (job description). The signer therefore waives and releases any mechanic's lien right, any right arising from a payment bond that complies with a state or federal statute, any common law payment bond right, any claim for payment, and any rights under any similar ordinance, rule, or statute related to claim or payment rights for persons in the signer's position.

The signer warrants that the signer has already paid or will use the funds received from this final payment to promptly pay in full all of the signer's laborers, subcontractors, materialmen, and suppliers for all work, materials, equipment, or services provided for or to the above referenced project up to the date of this waiver and release.

Date: _____

_____ (Company name)

By _____ (Signature)

_____ (Title)

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DOCUMENT 00 73 46

PREVAILING WAGE RATES

North Texas Construction Industry Wage Survey

Classification	Avg. Hrly Rate	Health/ Welfare	Pension	Vacation	Total Package
AC Mechanic	\$30.41	\$5.50	\$1.54	\$1.21	\$38.66
AC Mechanic Helper	\$19.58	\$4.67	\$0.26	\$0.69	\$25.21
Bricklayer/Stone Mason	\$25.59	\$1.93	\$0.00	\$0.00	\$27.52
Bricklayer/Stone Mason Trainee	\$19.96	\$1.93	\$0.00	\$0.00	\$21.89
Bricklayer/Stone Mason Helper	\$16.38	\$1.93	\$0.00	\$0.00	\$18.31
Carpenter	\$23.98	\$3.33	\$1.74	\$0.77	\$29.82
Carpenter Helper	\$18.11	\$3.31	\$0.00	\$0.00	\$21.42
Concrete Cutter/Sawyer	\$23.50	\$0.23	\$0.24	\$0.00	\$23.97
Concrete Finisher	\$20.18	\$1.19	\$0.38	\$0.78	\$22.53
Concrete Form Builder	\$20.82	\$0.55	\$0.25	\$0.88	\$22.50
Drywall Mechanic	\$25.00	\$0.00	\$0.00	\$0.00	\$25.00
Electrician (Journeyman)	\$30.61	\$5.91	\$1.27	\$2.27	\$40.06
Electrician Apprentice (Helper)	\$19.65	\$4.87	\$0.77	\$1.77	\$27.06
Electronic Technician	\$24.80	\$2.88	\$0.98	\$0.77	\$29.43
Electronic Technician Helper	\$16.72	\$3.01	\$0.66	\$0.34	\$20.73
Glazier	\$27.00	\$2.26	\$0.81	\$1.04	\$31.11
Glazier Helper	\$23.00	\$2.26	\$0.69	\$0.88	\$26.83
Laborer Common	\$15.96	\$2.14	\$0.32	\$0.70	\$19.11
Laborer Skilled	\$20.37	\$2.02	\$0.53	\$0.86	\$23.79
Lather	\$21.00	\$0.00	\$0.00	\$0.00	\$21.00
Lather Helper	\$18.00	0.00	0.00	0.00	\$18.00
Metal Installer (Miscellaneous)	\$22.50	\$0.00	\$0.87	\$0.87	\$24.24
Metal Installer Helper (Miscellaneous)	\$20.55	\$1.55	\$4.21	\$1.19	\$27.50
Painter	\$17.17	\$0.00	\$0.00	\$0.63	\$17.80
Painter Helper	\$13.00	\$0.00	\$0.00	\$0.43	\$13.43
Pipefitter	\$27.97	\$4.42	\$0.74	\$1.19	\$34.33
Pipefitter Helper	\$19.85	\$3.44	\$0.45	\$0.72	\$24.46

PREVAILING WAGE RATES

00 73 46 - 1

Project Name
Owner
Location

Classification	Avg. Hrly Rate	Health/ Welfare	Pension	Vacation	Total Package
Plasterer	\$23.00	\$0.00	\$0.00	\$0.00	\$23.00
Plumber	\$28.83	\$4.42	\$0.96	\$1.13	\$35.34
Plumber Helper	\$20.85	\$3.83	\$0.52	\$0.77	\$25.98
Reinforcing Steel Setter	\$23.71	\$0.19	\$0.21	\$0.00	\$24.11
Reinforcing Steel Setter Helper	\$16.00	\$0.19	\$0.00	\$0.00	\$16.19
Roofer	\$21.09	\$1.50	\$0.10	\$0.74	\$23.43
Roofer Helper	\$17.93	\$1.50	\$0.10	\$0.40	\$19.93
Sheet Metal Worker	\$25.59	\$4.90	\$0.72	\$1.04	\$32.24
Sheet Metal Worker Helper	\$18.66	\$3.61	\$0.28	\$0.71	\$23.26
Steel Worker Structural	\$23.65	\$1.55	\$6.19	\$1.36	\$32.75
Steel Worker Structural Helper	\$16.80	\$1.55	\$4.40	\$0.97	\$23.72
Waterproofer	\$23.42	\$1.55	\$0.10	\$0.67	\$25.74
Crane, Clamsheel, Backhoe, Derrick, D'Line Shovel	\$21.22	\$1.27	\$1.88	\$0.77	\$25.14
Forklift	\$22.23	\$4.73	\$1.13	\$0.96	\$29.04
Foundation Drill Operator	\$19.50	\$4.40	\$0.00	\$6.00	\$29.90
Front End Loader	\$23.54	\$0.00	\$0.00	\$0.83	\$24.37
Truck Driver	\$21.60	\$2.13	\$0.52	\$0.94	\$25.19
Welder	\$25.57	\$3.89	\$0.85	\$1.18	\$31.50
Welder Helper	\$16.98	\$2.63	\$1.38	\$1.06	\$22.06

DOCUMENT 00 73 50

WEATHER TABLE

MONTH	AVERAGE DAYS RAIN (1)	INCHES RAINFALL (2)	SNOW/ICE PELLETS (3)
JANUARY	6.9	2.53	0.0
FEBRUARY	6.9	2.76	0.3
MARCH	7.8	3.30	0.2
APRIL	6.9	3.22	0.0
MAY	9.1	4.78	0.0
JUNE	7.2	3.70	0.0
JULY	4.4	2.08	0.0
AUGUST	5.2	2.18	0.0
SEPTEMBER	5.1	2.72	0.0
OCTOBER	7.1	4.37	0.0
NOVEMBER	6.2	2.53	0.0
DECEMBER	6.5	2.84	0.1
ANNUALLY	79.3	37.01	0.6

(1) Mean number of days rainfall, 0.01" or more.

(2) Average normal precipitation, in inches.

(3) Mean number of days 1.0" or more.

* Less than 0.05".

This table is based on information reported from Dallas/Fort Worth International Airport, Texas. Latitude 32.898° N, longitude -97.0189° W, elevation (ground) 560 feet.

Means are based on records covering a period of 30 years. Normals based on record for the 1991-2020 period.

END OF SECTION

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SECTION 01 11 00

SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Requirements:
 - 1. Document 00 21 16 - Instructions to Proposers.
 - 2. Document 00 70 00 - General Conditions of the Contract for Construction: Provisions for use of site; Owner occupancy; Relations of Contractor - subcontractors.
 - 3. Document 00 73 00 - Supplementary Conditions to the Contract for Construction.
 - 4. Section 01 32 16 - Construction Progress Schedules: Format of work schedule.
 - 5. Section 01 45 23 - Testing and Inspection Services.
 - 6. Section 01 50 00 - Temporary Facilities and Controls.

1.2 DESCRIPTION

- A. The work comprises the construction of a new Agricultural Science Complex for Eagle Mountain-Saginaw Independent School District, Fort Worth, Texas, as shown on the drawings and described in the specifications. The work will be done under one lump sum contract.
- B. Indication on the drawings or mention in the specifications of articles, materials, operations or methods requires that the Contractor provide each item indicated or mentioned of the quality or subject to the qualifications noted, and perform according to the conditions stated each operation described and provide therefor all necessary labor, equipment, services and incidentals.
 - 1. Subcontractors are responsible for examining the architectural drawings for structural, mechanical, electrical, and plumbing items. Items shown on these drawings shall be furnished by the appropriate subcontractor.

1.3 CONDITIONS OF THE CONTRACT

- A. The General Conditions (Modified) and Supplementary Conditions as preceding portions of these specifications, form a part thereof and shall govern the work under each section.

1.4 EXISTING SITE CONDITIONS

- A. Visit and examine the site. Upon award of the Contract, the Contractor shall accept the condition of the site before beginning the work required.

1.5 SPECIAL REQUIREMENTS

- A. Do not block required fire exits.
- B. Assume responsibility for the protection of areas of work and provide and maintain protections required. Protect surfaces of the building and equipment, both interior and exterior, as required during the construction period.
- C. Where designated on the drawings, salvage, relocate and reinstall certain items. Existing items so designated shall be properly installed, securely fastened as required, set plumb and level and left complete and operational. Exercise extensive care in relocating such items so as to prevent damage. Other existing building materials indicated to be removed or demolished, unless noted otherwise or claimed by the Owner shall become property of the Contractor and shall be removed from the site immediately.
- D. Execute Certificate of Substantial Completion for each designated portion of work prior to Owner occupancy. Following execution of a Substantial Completion Certificate for a designated portion of the work, the Contractor shall permit:
 - 1. Access for Owner personnel.
 - 2. Use of parking facilities for the benefit of the Owner.
 - 3. Operation of HVAC and electrical systems for the benefit of the Owner.

Despite partial Owner and animal occupancy, the Contractor shall remain responsible for portions of the work which have not attained Substantial Completion and for which a Substantial Completion Certificate, which shall designate the date on which the Owner shall become responsible for utilities, maintenance, security, damage to the work and insurance, has not been executed.

- E. The loop fire lane and fire hydrants are required by the City to be in place and operational during construction and prior to steel erection.

1.6 CONTRACTOR USE OF PREMISES

- A. Limit use of premises for work, for storage and for access, to allow for Owner occupancy.
- B. Coordinate use of premises under direction of Owner.
- C. Assume full responsibility for protection and safekeeping of products under this contract.
- D. Obtain and pay for use of additional storage or work areas needed when required for operations under this Contract.
- E. There shall be no fires on the site or in the building. There shall be no dumping on Owner's property.
- F. Worker Identity Badging Requirements: Provide construction personnel (including subcontractors and suppliers regularly visiting the project site) with identification badges, with photograph. Identification badges shall be worn visibly by construction personnel on the construction site or on Owner's property. NO EMPLOYEE WILL BE PERMITTED ON SITE WITHOUT THIS BADGE DISPLAYED ON THE EMPLOYEE. Contractor must assure that the Crisis Management contact information is provided on the reverse side of each worker's badge. Temporary or visitor badges will be provided for persons who are identified as having an infrequent or temporary legitimate business need for access to the site.

1.7 WORK RESTRICTIONS

- A. On-Site Work Hours: Work shall be generally performed on the project site during normal business working hours of 6:00 a.m. to sundown, Monday through Friday. If within 300 feet of an occupied residence 7:00 a.m. to 8:00 p.m., or City ordinance whichever is more restrictive.
 - 1. Weekend Hours: Comply with the City of Fort Worth restrictions 9:00 a.m. to 8:00 p.m. on Saturday. No work shall be performed on Sundays, unless specifically allowed by City and Owner.
 - 2. Early Morning Hours: Comply with City noise ordinances for restriction of early-morning concrete pours and other noisy construction activities. Owner's testing laboratory personnel will be available only during on-site work hours listed above.

1.8 OWNER-FURNISHED PRODUCTS

- A. Contractor Responsibilities
 - 1. Protect products from damage.
 - 2. Repair or replace items damaged by Contractor.
 - 3. Make all necessary electrical and plumbing service connections to Owner supplied equipment.
- B. Schedule of Owner-furnished items
 - 1. Animal exercise and training equipment
 - 2. Refrigerators
 - 3. Agricultural Windmill
 - 4. Refer to Drawings.

1.9 COORDINATION

- A. Drawing details and other sections of these specifications covering work connected with or relating to that specified under a specific heading shall be examined for conditions which may affect that part of the work. Failure to do so will not relieve those furnishing materials and/or labor under a specification heading from supplying materials or performing work reasonably necessary to properly coordinate their work with that of other trades.

1.10 LAYING OUT WORK, MEASUREMENTS

- A. Employ a competent engineer or surveyor to establish and maintain lines and levels. Establish and maintain at least two elevation bench marks remote from each other and located outside the building area. Set alignment and location stakes.
- B. Verify measurements at the building. No extra compensation will be allowed for differences between actual dimensions and dimensions indicated on the drawings. Figured dimensions and measurements taken at the site shall take precedence over scaled dimensions.

1.11 DISCREPANCIES

- A. In case of discrepancies within the drawings, within the specifications, or between the drawings and specifications, the better quality and greater quantity, in the opinion of the Architect, shall be furnished and installed.

1.12 PIPING

- A. Should active piping or conduit be encountered below grade within the building structure and be found at variance with the known conditions indicated by the drawings and specifications, said piping and/or conduit shall be relocated as required by the Architect, and the contract sum shall be fairly adjusted on the basis of the cost of labor and materials. The Contractor shall provide temporary support of active piping and conduit encountered in the excavations until permanently supported or removed. The Contractor shall cut off and cap or plug abandoned lines at least 3 ft. outside the building lines. Conform to the applicable requirements of the locality or governing agency.

1.13 PROTECTION

- A. General: Limit use of the premises to construction activities in areas indicated; allow for Owner occupancy in adjacent spaces and around the site.
 - 1. Confine operations to areas within Contract limits indicated. Portions of the building which are outside the areas construction operations are indicated, are not to be disturbed.
 - 2. Keep driveways and entrances serving the premises clear and available to the Owner and the Owner's employees. Do not use these areas for parking or storage of materials without prior approval. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
 - 3. Do not dispose of organic and hazardous material on site, either by burial or by burning. Disposable material and trash must be removed properly.
- B. Assume responsibility for the premises and provide and maintain protections required by the governing laws, regulations and ordinances. The Contractor shall be responsible for loss or damage caused by him or his workmen to the property of the Owner or to the work or materials installed, and shall make good loss, damage or injury without cost to the Owner.
- C. The protection of adjacent property shall include but will not necessarily be limited to the erection and maintenance of shoring, underpinning and fences as necessary to protect and support existing work to be left in place.
- D. Finished floors shall be protected against damage by workmen and equipment during the work. Where materials are carried into the building, the building floors shall be covered to protect the work against dirt or grit being ground in.
- E. Trees and shrubs on the site which do not have to be removed for the new work shall be protected against damage. No Contractor shall remove or trim trees and shrubs in the area without the express approval of the Architect.
- F. Send proper notices, make necessary arrangements and perform other services required for the care, protection and maintenance of Public Utilities, including fire plugs and wires and other items of this character on and around the building site.
- G. Maintain accessible building exits required by the City during construction. Protection of these exits shall include dust-proof enclosures, illumination and exit lighting required.

1.14 CUTTING AND PATCHING

- A. Cutting and chasing of existing construction for relocation of mechanical and electrical work and for installation of pipes and ducts will be done by the trades concerned. Patching and finishing shall be done by the Contractor. This work shall be done with proper tools and by careful workmen of the particular trade to which such work belongs and shall be done without extra cost to the Owner.

1.15 RECORD DRAWINGS

- A. Maintain a complete clean set of drawings and Project Manual in the project field office for the sole purpose of recording "installed" conditions. Installed conditions shall include addendum items, change orders, or other items which come up during the construction phase which deviate from the Construction Documents. Changes made in these drawings and Project manual in connection with the final construction and installation shall be neatly made in red ink. Upon completion of the project, the marked set of drawings and Project Manual shall be delivered to the Architect for subsequent transmittal to the Owner. These drawings shall be maintained to reflect the current conditions of the work and changes shall be reviewed on a monthly basis with the Architect's representative. The Contractor's updating of the "installed" condition drawings and Project Manual shall be a prerequisite to the monthly review of the Contractor's payment request by the Architect's representative.

1.16 INSTRUCTIONS CONCERNING ASBESTOS

- A. In the event the Contractor encounters on the site material reasonably believed to be asbestos which has not been rendered harmless, the Contractor shall immediately stop work in the area affected and report the condition to the Owner in writing. If, in fact the material is asbestos and has not been rendered harmless, the work in the affected area shall not thereafter be resumed until the asbestos has been removed or rendered harmless by the Owner. The work in the affected area shall be resumed in the absence of asbestos, or when it has been rendered harmless, by written agreement of the Owner and Contractor.
- B. The Contractor will not be required to perform without consent work relating to asbestos.

PART 2 - PRODUCTS

Not used

PART 3 - EXECUTION

Not used

END OF SECTION

SECTION 01 21 00

ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements governing allowances.
 - 1. Certain materials and equipment are specified in the contract documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by change order.
- B. Related Requirements:
 - 1. General Conditions of the Contract for Construction.
 - 2. Section 01 22 00 - Unit Prices; procedures for using unit prices.
 - 3. Section 01 32 16 - Construction Progress Schedules: Product delivery and installation dates.
 - 4. Individual Specifications Sections Listed Under Schedule of Allowances: Specification of products and installation under allowances.

1.2 COSTS INCLUDED IN ALLOWANCES

- A. Cost of product to Contractor or subcontractor, less applicable trade discounts.
- B. Delivery to site.
- C. Applicable taxes.

1.3 CONTRACTOR COSTS INCLUDED IN CONTRACT SUM

- A. Products handling at site, including unloading, uncrating and storage.
- B. Protection of products from elements and from damage.
- C. Labor for installation and finishing.
- D. Other expenses required to complete installation.
- E. Contractor overhead and profit.

1.4 ADJUSTMENT OF COSTS

- A. Should the net cost be more or less than the specified amount of the allowance, the contract sum will be adjusted accordingly by change order.
- B. Submit any claims for anticipated additional costs at the site, or other expenses caused by the selection under the allowance, prior to execution of the work.
- C. Submit documentation for actual additional costs at the site, or other expenses caused by the selection under the allowance, prior to execution of the work.
- D. Failure to submit claims within the designated time will constitute a waiver of claims for additional costs.

1.5 ARCHITECT RESPONSIBILITIES

- A. Consult with Contractor in consideration of products, suppliers and installers.
- B. Select products, obtain Owner's written decision, and transmit full information to Contractor as follows
 - 1. Manufacturer, product, model or catalog number, accessories, attachments and finishes.
 - 2. Supplier and installer as applicable.

3. Cost to Contractor, delivered to site (and installed, if so specified).

1.6 CONTRACTOR RESPONSIBILITIES

- A. At the earliest practical date after award of the contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the work.
- B. Assist Architect in determining suppliers; and installers; obtain proposals when requested.
- C. Make recommendations for Architect consideration.
- D. Promptly notify Architect of any reasonable objections against supplier or installer.
- E. On notification of selection execute purchase agreement with designated supplier and installer.
- F. Arrange for and process shop drawings, product data and samples.
- G. Arrange for delivery. Promptly inspect products upon delivery for completeness, damage and defects. Submit claims for transportation damage.
- H. Install, adjust and finish products.
- I. Provide warranties for products and installation.

1.7 CORRELATION WITH CONTRACTOR SUBMITTALS

- A. Schedule shop drawings, product data, samples and delivery dates, in progress schedule for products selected under allowances.

PART 2 - PRODUCTS – Not used.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate allowance work with related work to ensure proper integration and interface.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Allow the lump sum of \$40,000.00 for purchase and delivery of the windmill, stock tank and demonstration water recirculation pump.
- B. Allowance No. 2: Allow the lump sum of \$10,000.00 for the purchase and delivery of cast aluminum exterior building letters.
- C. Allowance No. 3: Allow the lump sum of \$5,000.00 for the purchase and delivery of room identification signs not shown in the Contract Documents.
- D. Allowance No. 4: Allow the lump sum of \$60,000.00 for HVAC Testing and Air Balancing.
- E. Allowance No. 5: Allow the lump sum of \$75,000.00 for pier overage.

- F. Allowance No. 6: Allow the lump sum of \$60,000.00 for Building Management Commissioning.
- G. Allowance No. 7: Allow the lump sum of \$15,000.00 for changes requested by the Owner related to TAS accessibility requirements.

END OF SECTION

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SECTION 01 22 00

UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Document 00 42 00 - Proposal Form
 - 2. Section 01 29 00 - Payment Procedures: Procedures for submitting and handling Change Orders.
 - 3. Section 31 32 00 - Soil Stabilization
 - 4. Section 31 63 29 - Drilled Concrete Piers.
 - 5. Section 32 13 13 - Concrete Paving.

1.2 DEFINITIONS

- A. Unit price is an amount proposed by bidders as a price per unit of measurement for materials or services added to or deducted from the contract sum by appropriate modification, if the estimated quantities of work required by the contract documents are increased or decreased.

1.3 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, overhead, profit and applicable taxes.
- B. Measurement and Payment: Refer to individual specification sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those sections.
- C. The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established unit prices, and to have this work measured, at the Owner's expense, by an independent surveyor acceptable to the Contractor.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

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SECTION 01 29 00

PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Applications and Certificates for Payment.
 - 2. Change Order Procedures.
 - 3. Schedule of Values: Submit to the Architect the Schedule of Values allocated to various portions of the work within five days after "Notice-to-Proceed". Upon request of Architect, support values with data which will substantiate their correctness.
- B. Related Requirements:
 - 1. Conditions of the Contract for Construction.
 - 2. Section 01 32 16 - Construction Progress Schedules.
 - 3. Section 01 77 00 - Closeout Procedures.
 - 4. Section 01 78 39 - Project Record Documents.

1.2 APPLICATIONS AND CERTIFICATES FOR PAYMENT

- A. Progress payments shall be made as the work proceeds at intervals stated in the Contract.
- B. Work covered by progress payments shall, at the time of payment, become the property of the Owner.
- C. Form of Application and Certificate for Payment shall be notarized AIA Document G702 - Application and Certification for Payment, supported by AIA document G703 - Continuation Sheet. Submit two hard copies. Architect will retain a digital copy and return signed hard copies to the Owner and Contractor.
- D. Conditions governing regular schedule for applications, payment and retainage are as stated in the Contract.
- E. With each Application for Payment, Contractor shall certify that such Application for Payment represents a just estimate of cost reimbursable to Contractor under terms of Contract.
- F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 - 1. Application for payment of materials and equipment stored off-site will only be considered if such payment application has been approved in advance by the Owner, and:
 - a. Items are suitably stored off the site at a location agreed upon in writing;
 - b. Items are stored locally for verification by the Architect;
 - c. Certificate of insurance for storage facility has been provided;
 - d. Evidence of transfer of title to Owner has been provided;
 - e. Consent of surety to payment for materials stored off-site has been provided; and
 - f. Compliance by Contractor has been attained for any other procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest.
 - 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on materials stored off-site.
 - 3. No application for payment may be submitted for raw materials stored off-site.

1.3 CONSTRUCTION CHANGE ORDER PROCEDURES

- A. Contractor to submit to Architect within five days of execution of Owner/Contractor Agreement name of individual authorized to accept changes on behalf of Contractor, and to be responsible for informing others in Contractor's employ of changes in the work.
- B. Change Order forms will be furnished and issued by Architect.

- C. Contractor Documentation of Changes:
 - 1. Maintain detailed records of work done on an accounting basis acceptable to Architect and Owner. Provide full information required for evaluation of proposed changes.
 - 2. Document each quotation for a change in cost or time with sufficient data to allow evaluation of quotation.
 - 3. On request, provide additional data to support computations:
 - a. Quantities of products, labor and equipment.
 - b. Insurance and bonds.
 - c. Overhead and profit.
 - d. Justification for any change in Contract Time.
 - e. Credit for deletions from Contract, similarly documented.
 - 4. Support each request for additional costs, and for work proposed on a time and material basis, with description of products, equipment, cost of labor and subcontracts, completely documented.
 - 5. Computation for changes in work will be computed in one of the manners described in the Conditions of the Contract.
- D. Initiation of Changes:
 - 1. Architect may submit Proposal Request which includes detailed description of change with supplementary or revised drawings and specifications.
 - 2. Contractor may initiate a proposed change by submittal of a request to Architect describing proposed change with statement of reason for change, and proposed effect on Contract Sum and Contract Time with full documentation and a statement of the effect on work of separate contractors. Document any requested substitutions in accordance with SECTION 01 62 00 - PRODUCT OPTIONS. Submission of such requests and receipt of same by Architect does not mean acceptance, or approval of proposed change.
- E. Authorization:
 - 1. The Owner may request, through the Architect, a Construction Change Directive, in writing, instructing Contractor to proceed with changes of all or in part of work, for subsequent inclusion in a Change Order that is pending. Directive will propose basis for necessary adjustments, if any, to Contract Sum or Time.
 - 2. Changes that affect Contract Sum and/or Contract Time will require a Change Order signed by the Owner and the Architect. Contractor's signature indicates agreement. Other orders, written or oral, by the Owner through the Architect or by the Architect shall be treated as a Change Order only if Contractor gives Owner proper written notice as described in Conditions of Contract.
 - 3. Promptly execute the change in work only upon receipt of approved Change Order or Owner's written Construction Change Directive.
- F. Execution:
 - 1. Architect will issue Change Orders for signatures of parties as provided in Conditions of Contract.
 - 2. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust Contract Sum as shown on Change Order.
 - 3. Promptly revise Progress Schedules to reflect change in Contract Time, revise sub-schedules to adjust times for other items of work affected by Change, and resubmit Schedule.
 - 4. Promptly enter Changes in Project Record Documents.

1.4 SCHEDULE OF VALUES FORM AND CONTENT

- A. Type schedule on 8-1/2" x 11" white paper; Contractor's standard forms and automated printout will be considered for approval by Architect upon Contractor's request. Identify schedule with:
 - 1. Title of project and location.
 - 2. Architect and Architect's project number.
 - 3. Name and address of Contractor.
 - 4. Contract designation.
 - 5. Date of submission.
- B. Follow the table of contents of this project manual as the format for listing component items.
 - 1. Identify each line item with the number and title of the respective major section of the specifications.
- C. For each major line item list sub-values of major products or operations under the item.
- D. For the various portions of the work:
 - 1. Each item shall include a directly proportional amount of the Contractor's overhead and profit.

2. For items on which progress payments will be requested for stored materials, break down the value into that listed above differentiating between stored on-site and stored off-site:
 - a. Cost of the materials, delivered and unloaded, with taxes paid.
 - b. Total installed value.

E. The sum of values listed in the schedule shall equal the total contract sum.

F. Indicate separate value associated with materials and labor.

G. Re-submittal: After review by Architect, revise and resubmit schedule as necessary.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

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SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Coordination of work of the contract.
- B. Related Requirements:
 - 1. Section 01 11 00 - Summary of Work: Sequence of construction and Owner occupancy.
 - 2. Section 01 31 19 - Project Meetings.
 - 3. Section 01 50 00 - Temporary Facilities and Controls: Architect's project management system.
 - 4. Section 01 62 00 - Product Options.
 - 5. Section 01 73 29 - Cutting and Patching.
 - 6. Section 01 77 00 - Closeout Procedures: Closeout submittals.

1.2 DESCRIPTION

- A. Coordinate scheduling, submittals and work of the various sections of specifications to ensure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items to be installed later.
- B. Coordinate sequence of work to accommodate Owner occupancy as specified in SECTION 01 11 00 - SUMMARY OF WORK.

1.3 MEETINGS

- A. In addition to progress meetings specified in SECTION 01 31 19 - PROJECT MEETINGS, hold coordination meetings and pre-installation conferences with personnel and subcontractors to ensure coordination of work.

1.4 COORDINATION OF SUBMITTALS

- A. Schedule and coordinate submittals specified in SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
- B. Coordinate work of various sections having interdependent responsibilities for equipment, such as installing, connecting to and placing in service.
- C. Coordinate requests for substitutions to ensure compatibility of space, of operating elements and effect on work of other sections.

1.5 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified. Reference SECTION 01 50 00 - TEMPORARY CONTROLS for Architect's project management system.
 - 1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
 - 2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
 - 3. Contractor shall always include a proposed solution along with the RFI.
 - 4. RFI's submitted to the Contractor by subcontractors, vendors, suppliers, or other parties to the Work shall be reviewed by the Contractor prior to submission to the Architect. If the Architect deems that such RFI requests have not been adequately reviewed by the Contractor, such requests will be returned to the Contractor for further action.

5. RFI requests are limited to a request for interpretation or clarification of the requirements of the Contract Documents. Interpretations provided by the Architect shall not change the requirements of the Contract or the Contract Documents. If the Contractor determines that the Architect's response to an RFI gives cause for a change in the Contract or the Contract Documents, the Contractor shall promptly, within 5 working days, give written notice to the Architect of request for adjustments. Requests for adjustments to the Contract shall be submitted in a manner consistent with the terms and conditions of the Contract Documents.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 1. Project name.
 2. Owner name.
 3. Owner's Project number.
 4. Name of Architect.
 5. Architect's Project number.
 6. Date.
 7. Name of Contractor.
 8. RFI number, numbered sequentially.
 9. RFI subject.
 10. Specification Section number and title and related paragraphs, as appropriate.
 11. Drawing number and detail references, as appropriate.
 12. Field dimensions and conditions, as appropriate.
 13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 14. Contractor's signature.
 15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches
- C. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow five working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
 1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.

1.6 COORDINATION OF SPACE

- A. Coordinate use of project space and sequence of installation of mechanical and electrical work which is indicated diagrammatically on drawings. Follow routings shown for pipes, ducts and conduits as closely as practicable, with due allowance for available physical space; make runs parallel with lines of building. Utilize space efficiently to maximize accessibility for other installations, for maintenance and for repairs.
- B. In finished areas, except as otherwise shown, conceal pipes, ducts and wiring in the construction. Coordinate locations of fixtures and outlets with finish elements.

1.7 COORDINATION OF CONTRACT CLOSEOUT

- A. Coordinate completion and cleanup of work of separate sections in preparation for substantial completion of portions of work designated for Owner partial occupancy.
- B. After Owner occupancy of premises, coordinate access to site by various sections for correction of defective work and work not in accordance with contract documents, to minimize disruption of Owner's activities.

- C. Assemble and coordinate closeout submittals specified in SECTION 01 77 00 - CLOSEOUT PROCEDURES.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

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SECTION 01 31 19

PROJECT MEETINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Scheduling and administration of progress meetings.
 - 2. Pre-installation conferences.
- B. Related Requirements:
 - 1. Section 01 31 00 - Project Management and Coordination.
 - 2. Section 01 31 19.13 - Preconstruction Meetings: Owner's preconstruction conference and pre-mobilization conference.
 - 3. Section 01 32 16 - Construction Progress Schedules.
 - 4. Section 01 33 23 - Shop Drawings, Product Data and Samples.
 - 5. Section 01 45 00 - Quality Control.
 - 6. Section 01 78 23 - Operation and Maintenance Data.
 - 7. Section 01 78 39 - Project Record Documents.

1.2 PROGRESS MEETINGS

- A. The Contractor will schedule monthly construction progress meetings, throughout progress of work. They will prepare agenda and distribute notice of each meeting to participants.
- B. Contractor shall make physical arrangements.
- C. Contractor will preside at meetings and issue meeting minutes.
- D. Location of Meetings: Contractor's field office.
- E. Attendance: Contractor, job superintendent, and Architect. Owner and professional consultants will attend as appropriate. Subcontractors and suppliers shall attend as Architect or Contractor sees necessary to agenda.
- F. Anticipated Agenda:
 - 1. Review of any outstanding old business from prior meeting minutes.
 - 2. Review of Contractor's updated Construction Schedule, including minimum two-week look ahead schedule.
 - 3. Review of work in-progress.
 - 4. Field observations and decisions.
 - 5. Status of correction of deficient items.
 - 6. Review of outstanding RFI's.
 - 7. Identification of problems which impede planned progress.
 - 8. Review of submittal schedule and status of submittals, including pending submittals and resubmittals.
 - 9. Review of off-site fabrication and delivery schedules.
 - 10. Corrective measures to regain projected schedules if project is behind schedule.
 - 11. Review of quality and work standards.
 - 12. Review of Proposal Request and Change Proposal Logs, including any known pending changes.
 - 13. Effect of proposed changes on progress schedule and coordination.
 - 14. Review of Contractor's updates to Project Record Documents.
 - 15. Review and signing of formal Application for Payment, as applicable.
 - 16. For Construction Manager projects, discuss variances between actual and estimated GMP costs.
 - 17. Other business relating to work.

1.3 PRE-INSTALLATION CONFERENCES

- A. When required in individual specification section, convene a pre-installation conference at work site prior to commencing work of the section.
- B. Require attendance of entities directly affecting, or affected by, work of the section.

PROJECT MEETINGS

- C. Notify Architect four days in advance of meeting date.
- D. Prepare agenda, preside at conference, record minutes and distribute copies within two days after conference to participants.
- E. Review conditions of installation, preparation and installation procedures and coordination with related work.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01 31 19.13

PRECONSTRUCTION MEETINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Contractor participation in preconstruction meetings.
- B. Related Requirements:
 - 1. Section 01 11 00 - Summary of Work: Administrative provisions.
 - 2. Section 01 31 00 - Project Management and Coordination.
 - 3. Section 01 31 19 - Project Meetings.

1.2 PRECONSTRUCTION MEETING

- A. Architect will schedule meeting within 15 days after notice of award.
- B. Attendance: Owner, Architect, and General Contractor and representatives of major subcontractors.
- C. Agenda
 - 1. Submittal of executed bonds and insurance certificates.
 - 2. Execution of Owner-Contractor Agreement.
 - 3. Distribution of Contract Documents.
 - 4. Submittal of list of subcontractors, list of products, schedule of values and progress schedule.
 - 5. Designation of responsible personnel.
 - 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal requests, change orders, allowances and Contract closeout procedures.
 - 7. Scheduling.
 - 8. Use of premises by Owner and Contractor.
 - 9. Owner's requirements and occupancy.
 - 10. Temporary facilities.
 - 11. Survey and building layout.
 - 12. Security and housekeeping procedures.
 - 13. Procedures for testing.
 - 14. Procedures for maintaining record documents.
 - 15. Requirements for startup of equipment.
 - 16. Accessibility Issues.
 - 17. Inspection and acceptance of equipment put into service during construction period.
 - 18. Notice to proceed.
 - 19. Color samples.
 - 20. Procedures for site meetings.
 - 21. Site access and security.
 - 22. Procedures and processing of TEA "Certification of Project Compliance" form.
 - 23. Substantial and final project completion procedures.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

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SECTION 01 32 16

CONSTRUCTION PROGRESS SCHEDULES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Procedures for preparation and submittal of digital construction progress schedules and periodical updating.
- B. Related Requirements:
 - 1. Section 01 11 00 - Summary of Work: Work sequence.
 - 2. Section 01 21 00 - Allowances.
 - 3. Section 01 29 00 - Payment Procedures: Schedule of Values.
 - 4. Section 01 33 23 - Shop Drawings, Product Data and Samples.

1.2 SUBMITTALS

- A. Within 21 days of the contract date, Contractor shall prepare and submit a digital Critical Path construction schedule for the work. After review, resubmit required revised data within 5 days.
- B. Submit revised digital Critical Path Construction Schedule monthly with each Application for Payment.
- C. Submit under transmittal letter specified in SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

1.3 WORK SCHEDULE FORMAT

- A. The schedule shall not exceed time limits current under the Contract Documents and shall be subject to the approval of the Architect. The Contractor shall prosecute the work vigorously and make every effort to start and complete each phase of the work on or before the dates stated.
- B. Should actual construction of project vary from the Critical Path schedule, Contractor shall take whatever actions are necessary to improve progress as quickly as possible in order to meet pre-determined milestones. Revise and re-submit schedule not less than every 30 calendar days. Presentation of the existing or updated Critical Path schedule, in three copies, along with the Certificate of Payment Request shall be a prerequisite to the monthly review of the payment request by the Architect's representative.
- C. Sequence of Listings: The chronological order of the start of each item of work.
- D. Scale and Spacing: To provide space for notations and revisions.
- E. Sheet Size: Minimum 11" x 17".

1.4 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by major specification section number.
- C. Identify work of separate stages and other logically grouped activities.
- D. Provide sub-schedules for each stage of work identified in SECTION 01 11 00 - SUMMARY OF WORK.
- E. Provide sub-schedules to define critical portions of entire schedule.
- F. Show accumulated percentage of completion of each item, and total percentage of work completed, as of the first day of each month.

- G. Provide separate schedule of submittal dates for shop drawings, product data and samples, including Owner furnished products and products specified under Allowances, and dates reviewed submittals will be required from Architect. Show decision dates for selection of finishes.
- H. Show delivery dates for Owner furnished products and products specified under Allowances.
- I. Coordinate content with SECTION 01 29 00 - PAYMENT PROCEDURES, Schedule of Values.

1.5 REVISIONS TO SCHEDULES

- A. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
- B. Identify activities modified since previous submittal, major changes in scope and other identifiable changes.
- C. Provide narrative report to define problem areas, anticipated delays and impact on Schedule. Report corrective action taken, or proposed and its effect.

1.6 DISTRIBUTION

- A. Distribute copies of reviewed schedules to job site file, subcontractors, suppliers and other concerned entities.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01 33 23

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Digital submission of shop drawings.
- B. Related Requirements:
 - 1. General Conditions of the Contract for Construction: Definitions and basic responsibilities of entities.
 - 2. Section 01 31 00 - Project Management and Coordination: Coordination of submittals.
 - 3. Section 01 32 16 - Construction Progress Schedules: Schedules for submittals.
 - 4. Section 01 45 00 - Quality Control: Mockups and samples for testing.
 - 5. Section 01 50 00 - Temporary Facilities and Controls: Project management software.
 - 6. Section 01 62 00 - Product Options.
 - 7. Section 01 78 23 - Operation and Maintenance Data.
 - 8. Section 01 78 39 - Project Record Documents.

1.2 GENERAL

- A. Refer to General Conditions, Paragraph 3.12 (for A201 & A201/CMA) (Shop Drawings, Product Data and Samples).
- B. Digital Submittals: Submit to the Architect shop drawings, product data, and samples required by specification sections. Do not submit illegible fax copies nor carbon copies of shop drawings and product data.
 - 1. Submit using the Architect's web-based project management program (Newforma Info Exchange). Prepare submittals as .pdf files, with a single file for each submittal, and upload to the Architect's project management program. Enter required data in program to fully identify submittal in accordance with the required submittal numbering format.
- C. Within 30 days of the contract date Contractor shall prepare and submit with the Schedule of Values a comprehensive schedule of shop drawings, product data and samples. This schedule shall include products which are proposed for substitution. Also include the estimated date of each submittal and anticipated date of submittal return. Allow the Architect reasonable time to review submittals.
 - 1. The schedule shall be submitted as an action submittal using the "Submittal" feature in the Architect's project management program (Newforma Info Exchange).
- D. Prepare schedule on basis of each specification section.
- E. For products specified under reference standards, include with listing of each product:
 - 1. Name and address of manufacturer.
 - 2. Trade name.
 - 3. Model or catalog designation.
 - 4. Manufacturer's data, including performance and test data, reference standards.

1.3 SHOP DRAWINGS

- A. Prepared by a qualified detailer. Prepare project-specific information, drawn accurately to scale. Do not base shop drawings on reproductions of the contract documents or standard printed data. Include supplier's / detailer's / manufacturer's title block.
- B. Identify details by reference to sheet and detail numbers shown on Contract Documents.
- C. Present in a clear and thorough manner original drawings which illustrate the portion of the work showing fabrication, layout, setting, or erection details, prepared by a qualified detailer. Title each drawing with Project and Contract name and number; identify each element of drawings by reference to sheet number and detail, schedule, or room number of Contract Documents.

1.4 PRODUCT DATA

- A. Manufacturer's standard schematic drawings and diagrams:
 - 1. Modify drawings to delete information which is not applicable to the work.
 - 2. Supplement standard information to provide additional information specifically applicable to the work.
- B. Manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data:
 - 1. Clearly mark each copy to identify pertinent materials, products or models.
 - 2. Show dimensions and clearances required.
 - 3. Show performance characteristics and capacities.
 - 4. Show wiring or piping diagrams and controls.
- C. Submit only pages which are pertinent; mark each copy of standard printed data to identify pertinent products, referenced to specification section and Article number. Show reference standards, performance characteristics and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions; and required clearances.
- D. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the work. Delete information not applicable.

1.5 SAMPLES

- A. Office samples shall be of sufficient size and quantity to clearly illustrate:
 - 1. Functional characteristics of product or material, with integrally related parts and attachment devices.
 - 2. Full range of color samples.
- B. Color Selections & Samples: Provide two (2) samples for the Architect's review and record. Provide cut sheet when applicable.
 - 1. Samples for Initial Selection: Submit one (1) 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. In addition to the physical samples required above, submit a .pdf file of photographs of the actual color samples and identifying labels.
 - 2. Samples for Verification: Submit two (2) full-size units or Sample of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or 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. In addition to the physical samples required above, submit a .pdf file of photographs of the actual color samples and identifying labels. Architect will retain physical samples.
 - a. After Color Board has been delivered to the project site, submit one (1) sample for verification in lieu of two (2). One will be retained by Contractor for mounting on Color Board after approval by Architect.
- C. Field Samples and Mock-ups:
 - 1. Erect at project site at location acceptable to Architect.
 - 2. Construct each sample or mock-up complete, including work of all trades required in finish work.
 - 3. Install each sample complete and finished. Acceptable finishes in place may be retained in completed work.
- D. Digital Samples: In addition to the physical Office Samples and Field Samples/Mock-ups, submit a .pdf file of photographs of the actual samples/mock-ups using the "Submittal" feature in the Architect's project management program (Newforma Info Exchange).
- E. Submit full range of manufacturer's standard finishes except when more restrictive requirements are specified, indicating colors, textures and patterns, for Architect selection.
- F. Submit samples to illustrate functional characteristics of products, including parts and attachments.
- G. Approved samples which may be used in the work are indicated in the specification section.
- H. Label each sample with identification required for transmittal letter.

1.6 CONTRACTOR REVIEW

- A. Review submittals prior to transmittal; determine and verify field measurements, field construction criteria, quantities and details, manufacturer's catalog numbers and conformance of submittal with requirements of Contract Documents.
- B. Coordinate submittals with requirements of work and of Contract Documents.
- C. Sign or initial in a rubber-stamped review block format, each sheet of shop drawings and product data and each sample label to certify compliance with requirements of Contract Documents. Notify Architect in writing at time of submittal, of any deviations from requirements of Contract Documents.
- D. Do not fabricate products or begin work which requires submittals until return of submittal with Architect acceptance.
- E. Contractor's responsibility for errors and omissions in submittals is not relieved by Architect's review of submittals.
- F. Contractor's responsibility for deviations in submittals from requirements of contract documents is not relieved by Architect's review of submittals, unless Architect gives specific written acceptance of deviations. Architect will review submittals for general conformance to design intent only.

1.7 SUBMISSION REQUIREMENTS

- A. Submit Shop Drawings and Product Data as soon as practicable after award of contract but not later than 30 calendar days before dates reviewed submittals will be needed.
- B. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 10 working days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Resubmittal Review: Allow 10 working days for review of each resubmittal.
- C. Submit all office samples as soon as practicable but not later than **60 or 20** days after award of contract in order to facilitate color selections and coordination of the various materials. Final color selections and release of shop drawings contingent upon color selection will not be made until all office samples have been submitted, coordinated and approved.
 - 1. Color Board shall be delivered to the project site after 60 days. Contractor is responsible for updating color board with samples submitted by Contractor and approved by Architect after 60 days.
- D. Digital Submittals: Submit to the Architect, or applicable consultant, shop drawings, product data, and samples required by specification sections. Do not submit illegible fax copies nor carbon copies of shop drawings and product data.
 - 1. The submittals shall be logged in by the General Contractor and tracked using the "Submittal" feature in the Architect's project management program (Newforma Info Exchange). All submittals shall be submitted in .pdf format.
 - a. Submittals 8-1/2" x 11" and/or 11" x 17" and greater than 50 pages: Provide digital copy for the Architect's records.
 - b. Large Format Drawings (larger than 11 x 17): Provide digital copy for the Architect's records.
 - 2. Architect will indicate, via markup on each digital submittal, the appropriate action, then return submittal via the Architect's project management program (Newforma Project Center).
 - 3. Submittals to be reviewed by consultants shall be submitted to the Architect via Architect's project management program with a copy simultaneously sent to the applicable consultant. Submittals will be reviewed by the consultant and then delivered/transmitted to the Architect via the Architect's project management program (Newforma Info Exchange) for his review prior to transmitting them to the contractor. Submittals to be reviewed by the testing lab shall be handled in the same manner.
 - 4. Color Selections & Samples: Reference "Samples" Article within this specification section.
- E. Contractor is responsible for the costs associated with the digital delivery of all submittals, and hard copy where required, to the Architect and the Architect's consultants and retrieval of all submittals from the Architect, when necessary.

- F. Accompany submittals with transmittal letter containing:
 - 1. Date.
 - 2. Project title and number.
 - 3. Contractor's name and address.
 - 4. Identification of specification section and submittal numbers.
 - 5. The number of each shop drawing, product data and sample submitted.
 - 6. Notification of deviations from contract documents.
 - 7. Other pertinent data.
- G. Submittals shall include:
 - 1. Date and revision dates.
 - 2. Project title and number.
 - 3. Names of Architect, Contractor, subcontractor, supplier and manufacturer.
 - 4. Identification of product or material and specification section number.
 - 5. Relation to adjacent structure, materials or other critical features.
 - 6. Field dimensions, clearly identified as such.
 - 7. Applicable reference standards.
 - 8. A blank space 3" x 4" for Architect's stamp.
 - 9. Identification of deviations from contract documents.
 - 10. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of field measurements, compliance with contract documents and coordination with requirements of the work. Note: Absence of the Contractor's stamp shall constitute grounds for rejection of the submittal until such time as the submittal has been processed in accordance with this requirement.
 - 11. Other pertinent data required by specifications.

1.8 RE-SUBMISSION REQUIREMENTS

- A. Re-submission: For submittals not approved by Architect, make corrections and changes in submittals required by Architect and re-submit until approved.
 - 1. The digital re-submission shall be logged in using the "My Expected Submittals" feature in the Architect's project management program (Newforma Info Exchange).
- B. Shop Drawings:
 - 1. Revise initial drawings and re-submit as specified for initial submittal.
 - 2. Indicate on drawings any changes which have been made, other than those requested by Architect.
- C. Product Data and Samples: Submit new data and samples as specified for initial submittal.

1.9 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

- A. Distribute reviewed submittal of shop drawings and product data which carry Architect's stamp as follows: Contractor's file, project site file, record documents file, other prime contractors.
- B. Keep and maintain a full set of submittals throughout the construction phase to be submitted to the Architect with other Close-out documents for delivery to the Owner for his permanent record. Set of submittals shall be delivered to the Architect in cardboard file boxes with string and button type closures. Organize submittals by CSI divisions, utilizing neatly labeled pressboard dividers to separate the sections. Neatly label short end of box with project name, contents and duration of construction.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01 41 00

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 CODES

- A. Where references are made on drawings or specifications to codes, they shall be considered an integral part of the contract documents as minimum standards. Nothing contained in the contract documents shall be so construed as to be in conflict with any law, bylaw or regulation of the municipal, state, federal or other authorities having jurisdiction.
- B. Perform work in compliance with all City of Fort Worth ordinances and requirements.

1.2 GOVERNING LAWS

- A. Additional information with legal implications regarding applicable governing laws and jurisdictions can be found in the conditions of the contract.

1.3 PERMITTING

- A. Contractor shall, without additional expense to Owner, obtain necessary licenses and permits, and be responsible for complying with any federal, state, county and municipal laws, codes and regulations applicable to the performance of the work, including, but not limited to, any laws or regulations requiring the use of licensed contractors to perform parts of the work.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

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SECTION 01 42 00

REFERENCES

PART 1 - GENERAL

1.1 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.
- C. Copies of Standards: 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.
 - 1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

- D. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in specifications or other contract documents, they shall mean the recognized name of the standards and regulations in the following list. Names, telephone numbers, and web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the contract documents.

ADAAG	Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities Available from Access Board www.access-board.gov	800.872.2253 202.272.0080
CRD	Handbook for Concrete and Cement Available from Army Corps of Engineers Waterway Experiment Station http://www.erdc.usace.army.mil/	601.634.2355
DOD	Department of Defense Military Specifications and Standards Available from Department of Defense Single Stock Point www.dodssp.daps.dla.mil	215.697.6257
FED-STD	Federal Standard (See FS)	
FS	Federal Specification Available from Department of Defense Single Stock Point www.dodssp.daps.dla.mil	215.697.6257
	Available from General Services Administration www.gsa.gov	202.501.1021
	Available from National Institute of Building Sciences www.nibs.org	202.289.7800
ICC-ES	ICC Evaluation Services, Inc. www.icc-es.org	800.423.6587 562.699.0543
MIL	See MILSPEC	
MIL-STD	See MILSPEC	
MILSPEC	Military Specification and Standards Available from Department of Defense Single Stock Point www.dodssp.daps.dla.mil	215.697.6257

TAS	Texas Accessibility Standards P.O. Box 12157 Austin, TX 78711 www.license.state.tx.us/ab/abtas.htm	512.463.3211
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1.2 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in specifications or other contract documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the contract documents.

AA	Aluminum Association, Inc. (The) www.aluminum.org	703.358.2960
AAMA	American Architectural Manufacturers Association www.aamanet.org	847.303.5664
AASHTO	American Association of State Highway and Transportation Officials www.transportation.org	202.624.5800
ACI	ACI International (American Concrete Institute) www.aci-int.org (www.concrete.org)	248.848.3700
AGA	American Gas Association www.aga.org	202.824.7000
AISC	American Institute of Steel Construction www.aisc.org	800.644.2400 312.670.2400
AISI	American Iron and Steel Institute www.steel.org	202.452.7100
ANSI	American National Standards Institute www.ansi.org	202.293.8020
APA	APA-The Engineered Wood Association www.apawood.org	253.565.6600
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers www.ashrae.org	404.636.8400
ASTM	ASTM International (American Society for Testing and Materials International) www.astm.org	610.832.9585
AWI	Architectural Woodwork Institute www.awinet.org	571.323.3636
AWPA	American Wood Protection Association www.awpa.com	205.733.4077
AWS	American Welding Society www.aws.org	800.443.9353 305.443.9353
BHMA	Builders Hardware Manufacturers Association www.buildershardware.com	212.297.2122
BIA	Brick Industry Association (The) www.gobrick.com	703.620.0010

CISCA	Ceilings & Interior Systems Construction Association www.cisca.org	630.584.1919
CLFMI	Chain Link Fence Manufacturers Institute www.chainlinkinfo.org	301.596.2583
CRSI	Concrete Reinforcing Steel Institute www.crsi.org	847.517.1200
DHI	Door and Hardware Institute www.dhi.org	703.222.2010
FM	Factory Mutual System (See FMG)	
FMG	FM Global (Formerly: FM - Factory Mutual System) www.fmglobal.com	401.275.3000
GA	Gypsum Association www.gypsum.org	301.277.8686
GANA	Glass Association of North America www.glasswebsite.com	785.271.0208
HMMA	Hollow Metal Manufacturers Association (See NAAMM)	
HPVA	Hardwood Plywood & Veneer Association www.hpva.org	703.435.2900
IGCC	Insulating Glass Certification Council www.igcc.org	315.646.2234
IGMA	Insulating Glass Manufacturers Alliance (The) www.igmaonline.org	613.233.1510
MBMA	Metal Building Manufacturers Association www.mbma.com	216.241.7333
MFMA	Maple Flooring Manufacturers Association, Inc. www.maplefloor.org	888.480.9138
MFMA	Metal Framing Manufacturers Association www.metalframingmfg.org	312.644.6610
MIA	Marble Institute of America www.marble-institute.com	440.250.9222
NAAMM	National Association of Architectural Metal Manufacturers www.naamm.org	630.942.6591
NCMA	National Concrete Masonry Association www.ncma.org	703.713.1900
NelMA	Northeastern Lumber Manufacturers' Association www.nelma.org	207.829.6901
NEMA	National Electrical Manufacturers Association www.nema.org	703.841.3200

NFPA	NFPA (National Fire Protection Association) www.nfpa.org	800.344-3555 617.770-3000
NFRC	National Fenestration Rating Council www.nfrc.org	301.589.1776
NHLA	National Hardwood Lumber Association www.nhla.com	800.933.0318 901.377.1818
NLGA	National Lumber Grades Authority www.nlga.org	604.524.2393
NOFMA	National Oak Flooring Manufacturers Association (The Wood Flooring Manufacturers Association) www.nofma.org	901.526.5016
NRCA	National Roofing Contractors Association www.nrca.net	800.323.9545 847.299.9070
NTMA	National Terrazzo & Mosaic Association, Inc. www.ntma.com	800.323.9736 540.751.0930
NWWDA	National Wood Window and Door Association (See WDMA)	
PCI	Precast/Prestressed Concrete Institute www.pci.org	312.786.0300
PDCA	Painting and Decorating Contractors of America www.pdca.org	800.332.7322 314.514.7322
SDI	Steel Deck Institute www.sdi.org	847.458.4647
SDI	Steel Door Institute www.steeldoor.org	440.899.0010
SEFA	Scientific Equipment and Furniture Association www.sefalabs.com	516.294.5424
SGCC	Safety Glazing Certification Council www.sgcc.org	315.646.2234
SIGMA	Sealed Insulating Glass Manufacturers Association (See IGMA)	
SJI	Steel Joist Institute www.steeljoist.org	843.626.1995
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association www.smacna.org	703.803.2980
SPIB	Southern Pine Inspection Bureau (The) www.spib.org	850.434.2611
TCNA	Tile Council of America, Inc. www.tileusa.com	864.646.8453
TPI	Truss Plate Institute, Inc. www.tpinst.org	703.683.1010

UL	Underwriters Laboratories Inc. www.ul.com	800.285.4476 847.272.8800
USGBC	U.S. Green Building Council www.usgbc.org	800.795.1747 202.828.7422
WCLIB	West Coast Lumber Inspection Bureau www.wclib.org	800.283.1486 503.639.0651
WDMA	Window & Door Manufacturers Association (Formerly: NWWA - National Wood Window and Door Association) www.wdma.com	800.223.2301 312.321.6802
WI	Woodwork Institute www.woodworkinstitute.com	916.372.9943
WWPA	Western Wood Products Association www.wwpa.org	503.224.3930

- B. Code Agencies: Where abbreviations and acronyms are used in specifications or other contract documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the contract documents.

BOCA	BOCA International, Inc. (See ICC)	
CABO	Council of American Building Officials (See ICC)	
IAPMO	International Association of Plumbing and Mechanical Officials www.iapmo.org	909.472.4100
ICBO	International Conference of Building Officials (See ICC)	
ICC	International Code Council (Formerly: CABO - Council of American Building Officials) www.iccsafe.org	888.422.7233 703.931.4533
SBCCI	Southern Building Code Congress International, Inc. (See ICC)	

- C. Federal Government Agencies: Where abbreviations and acronyms are used in specifications or other contract documents, they shall mean the recognized name of the entities in the following list. Names, telephone numbers, and web-site addresses are subject to change and are believed to be accurate and up-to-date as of the date of the contract documents.

CE	Army Corps of Engineers www.usace.army.mil	
CPSC	Consumer Product Safety Commission www.cpsc.gov	800.638.2772 301.504.6816
EPA	Environmental Protection Agency www.epa.gov	202.272.0167
OSHA	Occupational Safety & Health Administration www.osha.gov	800.321.6742 202.693.1999

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01 42 16

DEFINITIONS

PART 1 - GENERAL

1.1 DEFINITIONS

- A. "Furnish": Supply and deliver to project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- B. "Install": Operations at project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- C. "Product": Materials, systems and equipment.
- D. "Project Manual": Volume assembled for the Work which may include the bidding requirements, sample forms, conditions of the contract, and specifications.
- E. "Provide": Furnish and install, complete and ready for the intended use.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

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SECTION 01 45 00

QUALITY CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Quality control of products and workmanship.
 - 2. Contractor's construction-related professional design services.
 - 3. Contractor's design-related professional design services.
 - 4. Manufacturer's instructions.
 - 5. Manufacturer's certificates and field services.
 - 6. Mockups.
- B. Related Requirements:
 - 1. Section 01 33 23 - Shop Drawings, Product Data, and Samples: Field samples. Submittal of manufacturer's instructions.
 - 2. Section 01 42 00 - References.
 - 3. Section 01 45 23 - Testing and Inspection Services.
 - 4. Section 01 62 00 - Product Options.
 - 5. Individual Specifications Sections: Mockups required.
 - 6. Individual Specifications Sections: Contractor's professional design services required.

1.2 DESCRIPTION

- A. Maintain quality control over supervision, subcontractors, suppliers, manufacturers, products, services, workmanship, and site conditions, to produce work in accordance with contract documents.

1.3 DEFINITIONS

- A. Contractor's Professional Design Services: Design of some aspect or portion of the project by party other than the design professional of record. Provide these services as part of the Contract for Construction.
 - 1. Submit signed and sealed drawings, calculations, specifications, certifications, shop drawings, and other submittals required by individual specification sections. Prepare such deliverables directly by, or under direct supervision of, appropriate licensed design professional in the state the project is located.
- B. Design Service Types Required:
 - 1. Construction-Related: Services Contractor needs to provide in order to carry out the Contractor's sole responsibilities for construction means, methods, techniques, sequences, and procedures.
 - 2. Design-Related: Design services explicitly required to be performed by another design professional due to highly technical and/or specialized nature of a portion of the project. Services primarily involve engineering analysis, calculations, and design, and are not intended to alter the aesthetic aspects of the design intent of the project.

1.4 WORKMANSHIP

- A. Comply with industry standards of the region except when more restrictive tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- B. Provide suitably qualified personnel to produce work of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.
- D. Provide finishes to match approved samples.

1.5 CONTRACTOR'S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES

- A. Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.

- B. Provide such engineering services as may be necessary to plan and safely conduct construction operations and execute portions of the work. Such engineering services may pertain to, but may not be limited to, temporary construction of sheeting, shoring, supports, scaffolding, bracing, falsework, temporary or permanent foundation underpinning, stairs, steps, rigging, and hoisting.

1.6 CONTRACTOR'S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES

- A. Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.
- B. Base design on performance and/or design criteria indicated in individual specification sections. Submit a Request for Information (RFI) to Architect if the criteria indicated are not sufficient to perform required design services.
- C. Refer to individual specification sections regarding the required scope of Contractor's design-related professional design services.

1.7 MANUFACTURER'S INSTRUCTIONS

- A. Require compliance with instructions in full detail, including each step in sequence.
- B. Should instruction conflict with contract documents, request clarification from Architect/Engineer before proceeding.

1.8 MANUFACTURER'S CERTIFICATES

- A. When required in individual Specifications section, submit manufacturer's certificate, in duplicate, certifying that products meet or exceed specified requirements, executed by responsible officer.

1.9 MANUFACTURER'S FIELD SERVICES

- A. When required in individual Specifications section, have manufacturer or his authorized representative provide qualified representative to observe field conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment test, adjust, and balance of equipment as applicable, and to make written report of observations and recommendations to Architect.
- B. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Submit report in duplicate within 30 days of observation to Architect/Engineer for review.

1.10 MOCKUPS

- A. Tests will be performed under provisions of SECTION 01 45 23 - TESTING AND INSPECTION SERVICES.
- B. Assemble and erect complete, with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Acceptable mockups in place may be retained in completed work.

1.11 FIELD SAMPLES

- A. Install field samples at the site as required by individual specification sections for review.
- B. Acceptable samples represent a quality level for the work.
- C. Where field sample is specified in individual sections to be removed, clear area after field sample has been accepted by Architect/Engineer.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

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SECTION 01 45 23

TESTING AND INSPECTION SERVICES (BY OWNER)

PART 1 - GENERAL

1.1 SUMMARY

- A. Requirements Included: Owner provided materials testing laboratory services.
- B. Related Requirements:
 - 1. Document 00 31 32 - Geotechnical Data.
 - 2. Terms and Conditions: Inspections, testing, and approvals required by public authorities.
 - 3. Section 01 45 00 - Contract Quality Control: Manufacturer's certificates.
 - 4. Section 01 78 39 - Project Record Documents.
 - 5. Individual Specifications Sections: Inspections and tests required, and standards for testing.

1.2 SELECTION AND PAYMENT

- A. Owner will employ services of an independent materials testing laboratory to perform specified inspection and testing and will pay for these services directly to the testing laboratory.
- B. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform work in accordance with requirements of contract documents. Contractor will pay all testing required by local authorities having jurisdiction.

1.3 QUALITY ASSURANCE

- A. Laboratory shall comply with requirements of ASTM E 329 and ASTM D 3740 and provide certifications to this effect.
- B. Laboratory shall maintain a full-time registered Engineer on staff to review specific tests required by this specification.
- C. Laboratory shall be authorized to operate in State in which project is located.
- D. Testing equipment shall be calibrated to ensure accurate results and values in order to ensure that test results are true and valid, and at intervals with devices of an accuracy traceable to either NBS Standards or accepted values of natural physical constants.

1.4 LABORATORY RESPONSIBILITIES

- A. Provide qualified personnel at site after due notice from the contractor; cooperate with Architect, Contractor, and appropriate public authorities having jurisdiction in performance of services.
- B. Perform specified inspection, sampling, and testing of products in accordance with latest, up-to-date standards.
- C. Ascertain compliance of materials and mixes with requirements of contract documents.
- D. Promptly notify Architect, appropriate consultants, Contractor, Owner, and authority having jurisdiction of observed irregularities or non-conformance of work or products.
- E. Perform additional inspections and tests required by Architect, Owner, Contractor, or authority having jurisdiction.

1.5 LABORATORY REPORTS

- A. After each inspection and test, promptly submit two copies of laboratory report to Architect, one to applicable consultant, one to Owner, one to Contractor, and one to City. Include: Date issued, project title and number, name of inspector, date and time of sampling or inspection, weather conditions, identification of product and specifications section, location in the project, type of inspection or test, date of test, results of tests, and specific indication of conformance, or lack of such, with contract documents. When requested by Architect/Engineer, provide interpretation of test results.

1.6 LIMITS ON TESTING LABORATORY AUTHORITY

- A. Laboratory may not release, revoke, alter, or enlarge on requirements of contract documents.
- B. Laboratory may not approve or accept any portion of the work.
- C. Laboratory may not assume any duties of Contractor.
- D. Laboratory has no authority to stop work.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Deliver to laboratory at designated location adequate samples of materials proposed to be used which require testing, together with proposed mix designs.
- B. Cooperate with laboratory personnel, and ensure ready access to work and to manufacturer's facilities, if requested by testing lab.
- C. Provide incidental labor and facilities for access to work to be tested, to obtain and handle samples at the site, or at source of products to be tested, in order to facilitate tests and inspections, and for storage and curing of test samples.
- D. Notify laboratory of material sources and furnish lab-determined necessary quantities of representative samples of materials proposed for use which are required to be tested.
- E. Notify Architect and laboratory 24 hours prior to expected time for operations requiring inspection and testing services. Cancel notifications in a timely manner if items or systems are not ready for inspection as intended. Reimburse Owner for trip charges when cancellation notifications are not made in a timely fashion.
- F. Advise laboratory in a timely fashion to complete required inspection and testing prior to subsequent work being performed.
- G. Reimburse Owner for all subsequent re-testing of products or systems found to be defective or otherwise not in accordance with specification requirements, and for any overtime pay required as a result of any inspection requirements that may fall outside of normal job-site weekday work schedule. Remove rejected products or work and replace with products or work of specified quality.
- H. Notification of Source Change: The Contractor shall be responsible for notifying the Owner, Architect, Engineer, and testing laboratory when the source of any material is changed after the original tests or inspections have been made.

PART 2 - PRODUCTS – Not used.

PART 3 - EXECUTION

3.1 EARTHWORK (SITE GENERAL)

- A. Make necessary soil tests (Atterberg Limit Series ASTM D 4318 and ASTM D 698 Standard Proctor) to determine moisture content and density of existing subgrade. Perform necessary soil tests (Atterberg Limit Series and ASTM D 698 Standard Proctor for each type of imported fill) to determine the moisture content and to inspect and test the placement of additional fill lifts to verify that all fill materials used are in accordance with the specifications for that use. Perform one field density test (ASTM D 2922 and ASTM D 3017) per 5,000 sq. ft. of site area in the area affected on each lift prior to placement of additional fill material.
- B. Imported Topsoil Tests: Testing for topsoil quality compliance shall be performed by the Testing Laboratory.

3.2 PAVING OR SPECIAL SURFACE SUBGRADE PREPARATION

- A. Perform one subgrade in-place density test per 7,500 sq. ft. of subgrade, after subgrade preparation, in accordance with ASTM D 2922 and ASTM D 3017. Perform tests within 48 hours of pavement construction.
- B. Pulverization tests on lime subgrade, TEX101E, Part III, at same frequency as density tests.

3.3 BUILDING SUBGRADE PREPARATION

- A. Make necessary soil tests (Atterberg Limit Series and ASTM D 698 Standard Proctor for each type of fill) to determine the moisture content and density of existing subgrade and inspect and test the placement of additional fill lifts to verify that all fill materials used are in accordance with the specifications for that use. Perform one field density test (ASTM D 2922 and ASTM D 3017) for each 5,000 sq.ft. of area within the building footprint on each lift prior to placement of additional fill material.

3.4 DRILLED CONCRETE PIERS

- A. The independent testing laboratory shall provide the services of their registered geotechnical engineer at the initiation of the on-site pier drilling operations to determine the appropriate bearing material into which the piers are to be founded. Written documentation of the "determination" shall be prepared and forwarded to the Owner, Architect, and Contractor.
- B. Make on-site full-time inspections of the pier drilling operation for each pier drilled and placed to verify that the proper strata and penetration, or depth, has been attained, and determine that shafts are properly clean and dry before placing concrete.
- C. Maintain a pier log for each pier showing design requirements and actual in place size and depth, in accordance with example noted in Specification SECTION 31 63 29 - DRILLED CONCRETE PIERS.
- D. Verify that the excavation is of the proper size and adequately clean and dry.
- E. Verify that each shaft is founded at a depth in accordance with the geotechnical report, existing on-site conditions that may be encountered, and at the proper bearing strata.
- F. Verify that the reinforcing steel and concrete are properly placed in accordance with other testing provisions specified herein.
- G. Notify the Architect and Contractor if soil or water conditions may require casing of piers.
- H. Inspection reports of pier drilling shall contain the following:
 - 1. Pier Mark.
 - 2. Pier Depth.
 - 3. Depth of penetration into bearing strata.
 - 4. Plumbness deviation.
 - 5. Description of unusual conditions encountered, including groundwater.

6. Record of deviations from contract document requirements.
7. Other requirements, as defined in SECTION 31 63 29 - DRILLED CONCRETE PIERS.

3.5 FORMWORK, REINFORCING STEEL AND INSERTS

- A. Make general inspection of formwork.
- B. Prior to each concrete pour, inspect fabrication and bending of bars, bar sizes, spacing, placement and tying in accordance with ACI 315.
- C. Prior to each concrete pour, inspect positioning of steel inserts and assemblies, sizes, and spacing, and inspect fusion-welded anchors and sheer connectors.

3.6 CAST-IN-PLACE CONCRETE

- A. Design Mixes:
 1. At the beginning of the work, Contractor shall submit proposed concrete mixes for review by the Architect, structural engineering consultant, and testing laboratory, including the sieve analysis of fine and coarse aggregate ASTM C 136, dry rodded weight of coarse aggregate - ASTM C 29, and the specific gravity (bulk saturated surface dry), of fine and coarse aggregates ASTM C 127 and C 128.
 2. The testing laboratory will submit their findings to the structural consultant, who will subsequently forward this information, with their review of the submittals, to the Architect.
 3. Contractor shall not mix concrete for placing in the work until confirmation laboratory reports are supplied to reflect that each proposed mix will develop the strength required. Successful past history in accordance with ACI 318 will be satisfactory.
- B. Test Cylinders: Make at least one test of each day's pouring of concrete or each 100 cubic yards, whichever is the least, on each different portion or section of the work. Mold and cure specimens in accordance with ASTM C 31, and test in accordance with ASTM C 39. Test cylinders shall be made and tested by the laboratory. Footings, walls, and floor systems constitute different sections. Each test shall consist of four specimens, one of which shall be broken at seven days, two at 28 days and one held in reserve. Determine temperature and air content for each set of test cylinders in accordance with ASTM C 231.
- C. Field Quality Control:
 1. Determine slump for each concrete strength test and whenever consistency of concrete varies, in accordance with ASTM C 143.
 2. Monitor and record addition of water to concrete and length of time concrete is allowed to remain in truck.
 3. Verify delivery tickets indicating class of concrete, amount of water added during initial batching, and time initial batching occurred.
 4. Monitor work being performed in accordance with ACI (American Concrete Institute) recommendations as a standard of quality.
 5. Reference SECTION 03 30 00 - CAST-IN-PLACE CONCRETE for additional requirements.
- D. Source Quality Control: An independent testing laboratory representative shall periodically inspect and control concrete mixing and loading of transit mix trucks at batch plant at intervals appropriate to monitor quality of material issued on job.

3.7 MORTAR, GROUT, AND MASONRY REINFORCEMENT

- A. Coordinate with Owner's testing laboratory to provide periodic inspection of the following task:
 1. As masonry construction begins, the following shall be verified to ensure compliance:
 - a. Proportions of site prepared mortar.
 - b. Construction of mortar joints.
 - c. Location of reinforcement and connectors.
 2. The inspection program shall verify:
 - a. Size and location of structural elements.
 - b. Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction.
 - c. Specified size, grade, and type of reinforcement.
 - d. Protection of masonry during cold weather (temperature below 40°F.) or hot weather (temperature above 90°F.).

3. Prior to grouting, the following shall be verified to ensure compliance:
 - a. Grout space is clean.
 - b. Placement of reinforcement and connectors.
 - c. Proportions of site-prepared grout.
 - d. Construction of mortar joints.
- B. Coordinate with Owner's testing laboratory to provide continuous inspection of the following task:
 1. Grout placement shall be verified to ensure compliance with code and construction document provisions.

3.8 STRUCTURAL STEEL

- A. Fabrication of, erection of, and connections between, structural steel members, including welding and tension in high strength bolts, will be accomplished under and subject to the inspection of an independent testing agency. The general contractor, structural steel fabricator, and erector shall afford full cooperation to the laboratory.
- B. Perform the following testing and inspection: (Prior to placement of steel deck)
 1. Check location of condition of anchor bolts.
 2. Check plumbness and tolerance of steel frame.
 3. Qualification of welders and welding techniques (at Contractor's expense).
 4. Visually inspect common bolts.
 5. Inspection of high-strength bolting:
 - a. Visually inspect connections.
 - b. Check tightness of at least 33% of connections.
 - c. Check at least two bolts of each girder to column connection.
 6. Visually inspect field and shop welds.
 7. Ultrasonic or X-ray testing of full penetration welds.
 8. Re-inspect corrective measures required at expense of Contractor.
 9. Verify that no members are damaged.
 10. Verify that materials and installation are according to contract documents and industry standards.
- C. Gas Cutting: Do not use gas cutting torches for correcting fabrication errors in the structural framing. Cutting will not be permitted on any member, unless specifically approved by the structural engineer. Finish gas-cut sections equal to a sheared appearance when gas finish cutting is permitted. Do not flame cut holes or enlarge holes by burning.
- D. Correction: The fabricator or erector shall correct deficiencies in structural steel work which inspection and test reports have indicated to be not in compliance with the specified requirements. Perform all additional tests required to reconfirm non-compliance of the original work and to show compliance of corrected work. Retesting of non-conforming work shall be paid by the Contractor.
- E. All welders employed during erection of structural steel must be certified by The American Welding Society for type of base materials and positions encountered. Certification testing to be performed at Contractor's expense and copies of Certifications shall be submitted for review upon request and maintained at the project site by the Contractor.

3.9 STEEL JOISTS

- A. All steel joists and connections to structural steel members shall be inspected.
- B. Quality Assurance: All welding performed during the manufacture and erection of steel joists shall comply with the requirements of AWS D1.1.
- C. Inspect condition of joists after erection; check method of attachment to structures and details of bridging and accessories to verify compliance with required standards.

3.10 METAL DECKING

- A. Qualification of Welders: Qualify the welding process and all welders (at Contractor expense), and periodically monitor the work in accordance with the requirements of AWS D1.3.

- B. Testing Laboratory shall inspect steel decking to ensure the material and installation is in accordance with the specifications and shop drawings.

3.11 METAL DECK AND FIELD WELDED SHEAR STUDS:

- A. The erection of metal deck and field welded shear studs shall be subject to inspection by the testing agency.
- B. Shear Studs:
 - 1. Test minimum of two shear studs welded at start of each production period in order to determine generator, control unit and stud welder setting. Studs shall be capable of being bent 45° from vertical without weld failure. If, after welding, visual inspection reveals that sound weld or a full 360° fillet has not been attained for a particular stud, such stud shall be struck with hammer and bent 15° off perpendicular to nearest end of beam. Studs failing under this test shall be replaced.
 - 2. When the temperature is below 32°F., two studs from each group of 100 studs (or one stud if less than 100 studs are present) should be tested after cooling. Studs shall not be welded below 0°F. or when surfaces are wet with rain or snow. If stud fails in weld, two new studs shall pass test before resumption of welding.

3.12 AIR BARRIER

- A. Mock-up Testing: Perform preconstruction testing on field mock-ups. Air-barrier assemblies shall comply with performance requirements indicated, as evidenced by reports based on mockup testing by a qualified testing agency.
 - 1. Air-Leakage-Location Testing: Mockups will be tested for evidence of air leakage according to ASTM E 1186, chamber pressurization or depressurization with smoke tracers.
 - 2. Air-Leakage-Volume Testing: Mockups will be tested for air-leakage rate according to ASTM E 783 or ASTM E 2357.
 - 3. Water Penetration Testing: Mockups will be tested for water penetration according to ASTM E 1105.
 - 4. Adhesion Testing: Mockups will be tested for required air-barrier adhesion to substrate according to ASTM D 4541 (modified).
 - a. Use a type II pull tester, except that the membrane shall be cut through to separate the material attached to the disc from the surrounding material.
 - b. Perform test after curing period recommended by the material manufacturer.
 - c. Record mode of failure and area where the material failed in accordance with ASTM D4541.
 - d. The inspection report shall indicate whether the specified adhesion requirement has been met.
 - 5. Compatibility Determinations: Mockups will be inspected for visual signs of decay, chemical attack, or degradation of any kind. Suspect instances shall be reported to the corresponding manufacturer who shall provide a letter that approves moving forward with the project or rejects the use of the product or rejects the method or circumstances of installation with an appropriate explanation of the position taken.
 - 6. Notify Architect seven days in advance of the dates and times when mockups will be tested.
 - 7. Perform the air leakage test and water penetration test of mockups prior to installation of cladding and trim but after installation of all fasteners for cladding and trim, and after installation of other penetrating elements.
- B. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:
 - 1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
 - 2. Air-barrier dry film thickness.
 - 3. Continuous structural support of air-barrier system has been provided.
 - 4. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
 - 5. Site conditions for application temperature and dryness of substrates have been maintained.
 - 6. Maximum exposure time of materials to UV deterioration has not been exceeded.
 - 7. Surfaces have been primed, if applicable.
 - 8. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
 - 9. Termination mastic has been applied on cut edges.
 - 10. Strips and transition strips have been firmly adhered to substrate.
 - 11. Compatible materials have been used.
 - 12. Transitions at changes in direction and structural support at gaps have been provided.

13. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.

14. All penetrations have been sealed.

C. Tests: As determined by Owner's testing agency from among the following tests:

1. Qualitative Air-Leakage Testing: Test air barrier assemblies for air leakage according to ASTM E 1186, smoke pencil with pressurization or depressurization or ASTM E 1186, chamber pressurization or depressurization with smoke tracers.
2. Quantitative Air-Leakage Testing: Test air barrier assemblies for air leakage according to ASTM E 783.
3. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate according to ASTM D 4541 for each 600 sq. ft. of installed air barrier or part thereof.

3.13 SMOKE TEST OF DRAINAGE AND VENT PIPING

- A. Test to check for joint leakage in the sanitary sewer system and vent system.

3.14 OTHER WORK REQUIRING TESTS

- A. Refer to individual sections covered under Divisions 22, 23, and 26 for other work requiring tests by independent testing laboratory.
- B. Other Tests:
1. Moisture content in face brick.

END OF SECTION

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SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 GENERAL

- A. Provide temporary facilities and controls needed for the work including, but not limited to those described in the Articles below.
- B. Maintain temporary facilities and controls as long as needed for safe and proper completion of the work.

1.2 ACCESS

- A. Provide adequate access to and temporary roads to the site of the building if required for the prosecution of the work.
- B. Provide and maintain access to fire hydrants, free of obstructions.
- C. Covered Walkway: Erect a structurally adequate, protective covered walkway for passage of persons entering and exiting building. Coordinate with entrance gates, other facilities and obstructions. Comply with regulations of authorities having jurisdiction.
 - 1. Construct covered walkways using scaffold or shoring framing. Provide wood plank overhead decking, protective plywood enclosure walls, handrails, barricades, warning signs, lights, safe and well-drained walkways, and similar provisions for protection and safe passage. Extend the back wall beyond the structure to complete the enclosure fence. Paint and maintain in a manner acceptable to the Owner and the Architect.

1.3 FIELD OFFICE

- A. Provide and maintain a weathertight temporary field office equipped with adequate illumination; with glazed operable windows; with smooth tables for perusal of drawings and specifications; and with metal legal size four-drawer filing cabinet. During cold weather the field offices shall be equipped with a heating device to maintain 65°F. temperature during the work day. During hot weather the offices shall be equipped with an air conditioning device to maintain temperature below 80°F. Provide and pay for fuel and electric energy. In addition to the above listed equipment, provide a space to accommodate the site meetings and have a layout/conference table at 28" height and chairs for 12 people. Upon completion of the project, remove offices from the premises.

1.4 TELEPHONES AND ELECTRONIC COMMUNICATION SERVICE

- A. Provide telephones/mobile phones in the field office. Telephone shall be in operation from the commencement of work until the acceptance of the building. Contractor shall pay for installation, maintenance, and removal of telephones, lines and for all use charges.
- B. Electronic Communication Service: Provide a computer, printer, high-speed data connection, and internet service as required for the Contractor to maintain internet access and e-mail correspondence.
 - 1. Contractor shall pay for installation, maintenance, and removal of high-speed data connection and for all use charges.
 - 2. The Architect's project management system is Newforma Info Exchange, which can be accessed by logging in at the following websites:
<https://infoexchange.vlkarchitects.com/UserWeb/Login/Login.aspx?v=0> OR www.vlkarchitects.com
Contractor shall utilize this system for all formal and informal correspondence with the Architect and Architect's Consultants, including E-Mails, Requests for Information, Proposals, Submittals, Submittal Transmittals, Meeting Minutes (for regularly scheduled meetings), and Warranty Responses (if warranty items are submitted in the system). In addition, Subcontractor Lists, Project Schedules, Schedule of Values, Pay Applications and other documents requiring submission shall be uploaded in pdf, Word, or Excel format by the Contractor to the appropriate location in Newforma Info Exchange.
 - 3. While the project management system is very user friendly and easy to learn, Architect will provide informal training for the Contractor as necessary to expedite the Contractor's familiarity with the program.

1.5 TEMPORARY ELECTRICAL SERVICE

- A. The contractor shall provide, install, and maintain separate temporary electrical service, including a separate temporary electric meter and temporary pole, if required. The contractor shall be responsible for contacting and coordinating with the local utility company for the installation, maintenance and removal of the temporary service. The contractor shall pay for all costs associated with this separate temporary electrical service.
- B. Provide and maintain temporary electric power to points in the building convenient for and available to all trades, including mechanical and other contracts, so that power can be secured anywhere in the building with no more than a 100 ft. extension cord. Energy charges shall be paid by the Contractor.

1.6 TEMPORARY LIGHTING

- A. Provide and maintain temporary lighting inside the building for safe and adequate working conditions throughout all areas where work of any kind is being performed. Provide at least 1/2 watt of incandescent lighting for each square foot of space. Where practical, place temporary lights in the locations where the permanent lighting fixtures are to be installed.

1.7 TEMPORARY HEAT

- A. Provide necessary heat during the course of construction, including equipment, fuel and attendance where required. Equipment for temporary heating shall be of a non-smudging type. The permanent heating system may be used for temporary heat, when installed. Upon completion and before acceptance of the building, Contractor shall repair all damage caused by such temporary use and shall clean all filters.
- B. When the outside temperature is below freezing, inside of the building shall be kept at or above 40°F. at all times. While painting and finishing are in progress, the temperature shall be kept at or above 60°F. Contractor shall make good all damage caused by insufficient heat.

1.8 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- B. Utilize existing ventilation equipment. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

1.9 TEMPORARY WATER SERVICE

- A. Provide and maintain a temporary water supply during the course of construction and pay water bill and meter installation or "tap" fee, if any. Include necessary piping and hose connections. Take precautions to avoid spattering and spilling water in the building.

1.10 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain adequate sanitary toilet facilities on the project site. The toilet facilities shall meet the requirements of the public authorities having jurisdiction and their use strictly enforced. Sanitary sewer "tap" fee and monthly use fees, if any, shall be paid by Contractor if temporary facilities are connected to city sanitary sewer.

1.11 REFUSE

- A. The Contractor shall provide refuse removal service at all times.

1.12 PROTECTIVE FACILITIES

- A. Provide and maintain temporary guardrails, handrails and covers for floor, roof and wall openings, vertical shafts and stairways. If movement of the protective facilities is required by a subcontractor to perform his work, it will be the responsibility of that subcontractor to give prior notification to the Contractor and to replace the protective facilities in a satisfactory manner.

- B. Provide and maintain, as per City of Fort Worth requirements, fire lane(s) and other required fire protection at the appropriate time and sequence of construction.

1.13 BARRICADES

- A. Provide and maintain lighted barricades and fences for the public protection in accordance with requirements of the local city ordinances.

1.14 TEMPORARY FENCING

- A. Provide and maintain for the duration of construction a temporary fence of design and type needed to prevent entry onto the work by the public.

1.15 TEMPORARY FIRE PROTECTION

- A. Contractor shall provide adequate fire extinguishers on the premises during the course of construction, of the type and size recommended to control fires, which may result from the particular work being performed in accordance with the local fire marshal and fire codes.
- B. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of ignition for possible fires.
 - 1. Keep work area free of combustible material.
 - 2. A fire watch consisting of at least one man furnished by Contractor with a fire extinguisher in hand and with no other assigned duties, shall be posted to stand by and observe for potential hazards while welding or cutting is being done. Equip fire watch with suitable personal eye protection and fire extinguishers.
 - 3. At completion of work operations, immediately inspect work and adjacent area for hazards. Re-inspect work for hazards at 1/2 hour and at one hour after completion of welding and cutting operations.
- C. No smoking shall be allowed within the building or on the site. Post NO SMOKING signs in areas where work is in progress.

1.16 ENCLOSURES

- A. Provide temporary weathertight closures of openings in exterior surfaces to provide acceptable working conditions and protection for materials, to allow for temporary heating, and to prevent entry of unauthorized persons. Provide doors with self-closing hardware and locks.

1.17 ROOF AND STRUCTURE PROTECTION

- A. Distribute material, debris, and equipment over the roof deck to avoid damage to the structural deck. Not more than two weeks supply of material shall be stored on a roof at any given time. Place materials and equipment to be stored on the roof as nearly direct over structural members as can be determined. Secure equipment, material, and debris on the roof to prevent movement by wind or other elements. Contractor assumes full responsibility for loading on the structural deck or roofing materials during roof replacement operations.

1.18 WATER CONTROL

- A. Grade site to drain. Maintain excavations free of water. Provide and operate pumping equipment.
- B. Protect site from puddling or running water.

1.19 CLEANING DURING CONSTRUCTION

- A. Control accumulation of waste materials and rubbish; periodically dispose of off site.
- B. Clean interior areas prior to start of finish work, maintain areas free of dust and other contaminants during finishing operations.
- C. Refer to SECTION 01 74 13 - PROGRESS CLEANING for additional cleaning requirements.

1.20 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary materials, equipment, services, and construction prior to substantial completion inspection.
- B. Clean and repair damage caused by installation or use of temporary facilities. Remove underground installations to a depth of 2'; grade site as indicated. Restore existing facilities used during construction to specified, or to original, condition.

1.21 PROJECT IDENTIFICATION SIGNS

- A. Furnish and erect a project sign, approximately 4' high x 8' long or 6' high x 6' long of 3/4" thick exterior grade plywood, in conformance with sign detail supplied by the Architect. Support on posts of framing of treated wood or steel.
- B. Furnish and erect Architect logo signs in identical type, size and quantity as General Contractor logo signs. Architect logo signs shall be placed in locations adjacent to all General Contractor signs.
- C. Erect sign within 30 days of start of construction and maintain in good condition until completion of project. Sign shall be located as directed by the Architect.
- D. No other signs or advertising of any kind, except precautionary warning signs, will be permitted.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01 57 23

TEMPORARY STORM WATER POLLUTION CONTROL

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Storm Water Pollution Prevention and Pollution Control Plan as required by the Texas Commission on Environmental Quality (TCEQ), effective March 2023.
- B. Related Sections:
Section 31 00 00 - Earthwork

1.02 QUALITY ASSURANCE

- A. State Standards: Execution of the Pollution Prevention and the Pollution Control Plan shall meet all requirements set forth by TCEQ under the Texas Pollution Discharge Elimination System (TPDES) regulations.

PART 2 - PRODUCTS

NOT APPLICABLE.

PART 3 - EXECUTION

3.01 PERFORMANCE

- A. General: Implement all the requirements detailed in the Erosion Control Plan and any additional pollution prevention and control measures required by the TCEQ.
- B. The Erosion Control Plan is included as part of the construction plans. The erosion control measures shown on the plans are the minimum required for this project. The contractor shall implement additional erosion control devices as construction sequence and activities dictate.
- C. The SWPPP document (including N.O.I. and N.O.T.) that makes up the balance of the SWPPP shall be prepared by the contractor at his expense. The contractor shall be the Owner/Operator of the SWPPP and responsible for executing and filing the N.O.I. and N.O.T. and paying all fees required by TCEQ.

END OF SECTION

SECTION 01 62 00

PRODUCT OPTIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements for product options and substitutions.
- B. Related Requirements:
 - 1. Section 01 31 00 - Project Management and Coordination: Coordination of construction.
 - 2. Section 01 33 23 - Shop Drawings, Product Data, and Samples: Product data submittals.
 - 3. Section 01 42 00 - References: Applicability of specified reference standards.
 - 4. Section 01 78 23 - Operation and Maintenance Data.
 - 5. Section 01 78 39 - Project Record Documents.

1.2 PRODUCT LIST

- A. Within 30 days after date of contract, submit to the Architect a list of products and materials which are proposed for substitution per SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

1.3 CONTRACTOR'S OPTIONS

- A. For products specified only by reference standards, select any product meeting standards, by any manufacturer.
- B. For products specified by naming several products or manufacturers, followed by the words "NO SUBSTITUTIONS", select one of the products/manufacturers named.
- C. For products specified by naming only one product and manufacturer, there is no option unless a substitution is approved as specified below.
- D. For products specified by naming only one product and manufacturer, followed by the words "NO SUBSTITUTIONS", there is no option.

1.4 SUBSTITUTIONS

- A. Requests for substitution to material, products, or equipment instead of those specified will be considered if received at least 10 days prior to the bid date. Substitution request received within 10 days of the bid date will be returned without review. Refer to Substitution Request (During the Bidding Phase) form attached to this section.
- B. Within 30 days after Notice to Proceed, Architect will consider additional formal requests from the Contractor for substitutions of products in place of those specified. Refer to Substitution Request (After the Bidding Phase) form attached to this section.
- C. Submit a separate request for each substitution on a copy of the "SUBSTITUTION REQUEST" form, attached to this section. Include in request:
 - 1. Complete data substantiating compliance of proposed substitution with contract documents.
 - 2. For products:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturer's literature, including product description, performance and test data and reference standards.
 - c. Samples, if applicable.
 - d. Name and address of similar projects on which product was used and date of installation.
 - 3. For construction methods:
 - a. Detailed written descriptions of proposed method.
 - b. Complete drawings illustrating methods or revisions.
 - 4. Itemized Comparison of qualities of proposed substitution with product or method specified.
 - 5. Changes required in other elements of work because of substitution.
 - 6. Effect on construction schedule.

- D. Request for substitution constitutes a representation that General Contractor or Construction Manager:
 - 1. Has personally investigated proposed product or method and determined that it is equal to or superior in all respects to that specified.
 - 2. Will provide same warranties for substitution as for product or method specified.
 - 3. Will coordinate installation of accepted substitution into the work, making such changes as may be required for the work to be complete in all respects.
 - 4. Waives all claims for additional cost, under his responsibility and related to substitution, which subsequently become apparent.
- E. Substitutions will not be considered if:
 - 1. They are indicated or implied on shop drawings or product data submittals without formal request submitted in accordance with this section.
 - 2. Acceptance will require substantial revision of contract documents.
- F. If substitution is not approved or accepted, Contractor shall furnish specified product or method at no additional cost to the Owner.
- G. Acceptance of a proposed substitution prior to the bid date will be in the form of an addendum.

1.5 SUBMITTAL PROCEDURES

- A. Submit request for substitution.
- B. Architect will review Contractor's requests for substitutions with reasonable promptness.
- C. For accepted products, submit shop drawings, product data, and samples under provisions of SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SUBSTITUTION REQUEST
(During the Bidding Phase)
(Submittal must be received 10 days prior to bid/proposal date)

Project: _____	Substitution Request Number: _____
_____	From: _____
To: _____	Date: _____
_____	A/E Project Number: _____
Re: _____	Contract For: _____

Specification Title: _____	Description: _____
Section: _____ Page: _____	Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____	Address: _____	Phone: _____
Trade Name: _____	Model No.: _____	

Attached data includes product description, specifications, drawings, custom color/pre-selected color availability, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E/ design, detailing, and construction costs caused by the substitution.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

Telephone: _____

A/E REVIEW AND ACTION

- ☐ Substitution approved - Submit bid/proposal based on accepted substitution.
- ☐ Substitution approved as noted - Submit bid/proposal based on accepted substitution - as noted.
- ☐ Substitution rejected - Submit bid/proposal for specified materials.
- ☐ Substitution Request received too late - Submit bid/proposal for specified materials.

Signed by: _____ Date: _____

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

SUBSTITUTION REQUEST
(After the Bidding Phase)
(Submittal must be received not later than 30 days after Notice to Proceed)

Project: _____	Substitution Request Number: _____
_____	From: _____
To: _____	Date: _____
_____	A/E Project Number: _____
Re: _____	Contract For: _____

Specification Title: _____	Description: _____
Section No.: _____ Page: _____	Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Address: _____ Phone: _____

Trade Name: _____ Model No.: _____

History: ☐ New product ☐ 2-5 years old ☐ 5-10 years old ☐ More than 10 years old

Differences between proposed substitution and specified product: _____

For finish materials and pre-finished equipment, list the colors available for the specified item and the colors available for the proposed substitution.

☐ Point-by-point comparative data attached - REQUIRED BY A/E

Reason for not providing specified item: _____

Similar Installation:

Project: _____	Architect: _____
Address: _____	Owner: _____
_____	Date Installed: _____

Proposed substitution affects other parts of Work: ☐ No ☐ Yes; explain _____

Savings to Owner for accepting substitution: _____ (\$ _____).

Proposed substitution changes Contract Time: ☐ No ☐ Yes [Add] [Deduct] _____ days.

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

SUBSTITUTION REQUEST - Continued

The Undersigned certifies:

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

Telephone: _____

Attachments: _____

A/E REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Section 01 33 23.

☐ Substitution approved as noted - Make submittals in accordance with Section 01 33 23.

☐ Substitution rejected - Use specified materials.

☐ Substitution Request received too late - Use specified materials.

Signed by: _____ Date _____

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ A/E ☐ _____

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SECTION 01 65 00

PRODUCT DELIVERY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Requirements Included:
 - 1. Packaging, Transportation.
 - 2. Delivery and Receiving.
 - 3. Product Handling.
- B. Related Requirements:
 - 1. Section 01 32 16 - Construction Progress Schedules.
 - 2. Section 01 33 23 - Shop Drawings, Product Data, And Samples: Manufacturers' Instructions.
 - 3. Section 01 66 00 - Product Storage and Handling Requirements.
 - 4. Individual Sections: Specific requirements for packaging, shipping and handling.

PART 2 - PRODUCTS

NOT USED.

PART 3 - EXECUTION

3.1 PACKAGING, TRANSPORTATION

- A. Require supplier to package products in boxes or crates for protection during shipment, handling and storage. Protect sensitive products against exposure to elements and moisture.
- B. Protect sensitive equipment and finishes against impact, abrasion and other damage.

3.2 DELIVERY AND RECEIVING

- A. Arrange deliveries of products in accordance with construction progress schedules. Allow time for inspection prior to installation.
- B. Coordinate deliveries to avoid conflict with work and conditions at site; limitations on storage space; availability of personnel and handling equipment; and Owner's use of premises.
- C. Deliver products in undamaged, dry condition, in original unopened containers or packaging with identifying labels intact and legible.
- D. Clearly mark partial deliveries of component parts of equipment to identify equipment and contents to permit easy accumulation of parts and to facilitate assembly.
- E. Immediately on delivery, inspect shipment to assure
 - 1. Product complies with requirements of contract documents and reviewed submittals.
 - 2. Quantities are correct.
 - 3. Accessories, and installation hardware are correct.
 - 4. Containers and packages are intact and labels legible.
 - 5. Products are protected and undamaged.

3.3 PRODUCT HANDLING

- A. Provide equipment and personnel to handle products by methods to prevent soiling and damage.
- B. Provide additional protection during handling to prevent marring and otherwise damaging products, packaging and surrounding surfaces.

- C. Handle product by methods to avoid bending or over-stressing. Lift large and heavy components only at designated lift points.

END OF SECTION

SECTION 01 66 00

PRODUCT STORAGE AND HANDLING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Requirements Included:
 - 1. Storage, General.
 - 2. Enclosed Storage.
 - 3. Exterior Storage.
 - 4. Maintenance of Storage.
- B. Related Requirements:
 - 1. Section 01 11 00 - Summary of Work.
 - 2. Section 01 50 00 - Construction Facilities and Temporary Controls: Storage facilities. Protection of installed work.
 - 3. Section 01 65 00 - Product Delivery Requirements.
 - 4. Section 01 78 39 - Project Record Documents.

PART 2 - PRODUCTS - Not used.

PART 3 - EXECUTION

3.1 STORAGE, GENERAL

- A. Store products, immediately on delivery, in accordance with manufacturer's instructions, with seals and labels intact. Protect until installed.
- B. Arrange storage in a manner to provide access for maintenance of stored items and for inspection.

3.2 ENCLOSED STORAGE

- A. Store products, subject to damage by the elements, in substantial weathertight enclosures.
- B. Maintain temperature and humidity within ranges stated in manufacturer's instructions.
- C. Provide humidity control and ventilation for sensitive products as required by manufacturer's instructions.
- D. Store unpacked and loose products on shelves, in bins, or in neat groups of like items.

3.3 EXTERIOR STORAGE

- A. Provide substantial platforms, blocking, or skids, to support fabricated products above ground; slope to provide drainage. Protect products from soiling and staining.
- B. For products subject to discoloration or deterioration from exposure to the elements, cover with impervious sheet material. Provide ventilation to avoid condensation.
- C. Store loose granular materials on clean, solid surfaces such as pavement, or on rigid sheet materials, to prevent mixing with foreign matter.
- D. Provide surface drainage to prevent erosion and ponding of water.
- E. Prevent mixing of refuse or chemically injurious materials or liquids.

3.4 MAINTENANCE OF STORAGE

- A. Periodically inspect stored products on a scheduled basis.

- B. Verify that storage facilities comply with manufacturer's product storage requirements.
- C. Verify that manufacturer required environmental conditions are maintained continually.
- D. Verify that surfaces of products exposed to the elements are not adversely affected; that any weathering of finishes is acceptable under requirements of contract documents.

3.5 MAINTENANCE OF EQUIPMENT STORAGE

- A. For mechanical and electrical equipment in long-term storage, provide manufacturer's service instructions to accompany each item, with notice of enclosed instructions shown on exterior of package.
- B. Service equipment on a regularly scheduled basis, maintaining a log of services; submit as a record document.

END OF SECTION

SECTION 01 73 29

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Requirements and limitations for cutting and patching of work.
- B. Related Requirements:
 - 1. Section 01 11 00 - Summary of Work: Work by Owner or by separate contractors.
 - 2. Section 01 62 00 - Product Options.
 - 3. Individual Specifications Sections:
 - a. Cutting and patching incidental to work of the section.
 - b. Advance notification to other Sections of openings required in work of those sections.
 - c. Limitations on cutting structural members.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 – SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Submit written request in advance of cutting or alteration which affects
 - 1. Structural integrity of any element of the project.
 - 2. Integrity of weather-exposed or moisture-resistant element.
 - 3. Efficiency, maintenance, or safety of any operational element.
 - 4. Visual qualities of sight-exposed elements.
 - 5. Work of Owner or separate contractor.
- C. Include in request
 - 1. Identification of project.
 - 2. Location and description of affected work.
 - 3. Necessity for cutting or alteration.
 - 4. Description of proposed work and products to be used.
 - 5. Alternatives to cutting and patching.
 - 6. Effect on work of Owner or separate contractor.
 - 7. Written permission of affected separate contractor.
 - 8. Date and time work will be executed.

1.3 PAYMENT FOR COSTS

- A. Costs resulting from ill-timed or defective work, or work not conforming to contract documents, including costs for additional services of Architect or other consultants, shall be borne by the Contractor.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Products: Those required for original installation.
- B. For any change in materials, submit request for substitution under provisions of SECTION 01 62 00 - PRODUCT OPTIONS.

PART 3 - EXECUTION

3.1 GENERAL

- A. Execute cutting, fitting and patching including excavation and fill, to complete work, and to
 - 1. Fit the several parts together, to integrate with other work.
 - 2. Uncover work to install ill-timed work.
 - 3. Remove and replace defective and non-conforming work.

4. Remove samples of installed work for testing.
5. Provide openings in elements of work for penetrations of mechanical and electrical work.

3.2 INSPECTION

- A. Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- B. After uncovering, inspect conditions affecting performance of work.
- C. Beginning of cutting or patching means acceptance of existing conditions.

3.3 PREPARATION

- A. Provide temporary supports to assure structural integrity of surroundings; devices and methods to protect other portions of project from damage.
- B. Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.
- C. Maintain excavations free of water.

3.4 PERFORMANCE

- A. Execute work by methods to avoid damage to other work, and which will provide proper surfaces to receive patching and finishing.
- B. Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- C. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- D. Restore work with new products in accordance with requirements of contract documents.
- E. Fit work tight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.
- F. At penetrations of fire-rated wall, ceiling, or floor construction, completely seal voids with fire-rated packing material, full thickness of the construction element.
- G. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for an assembly, refinish entire unit.

END OF SECTION

SECTION 01 74 13

CLEANING

PART 1 - GENERAL

1.1 SUMMARY

- A. Work Included: Throughout the construction period, maintain the buildings and site in a standard of cleanliness as described in this section.
- B. Related Requirements: In addition to standards described in this section, comply with requirements for cleaning as described in other pertinent sections of these specifications.

1.2 QUALITY ASSURANCE

- A. Conduct a daily inspection, and more often if necessary, to verify that requirements for cleanliness are being met.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS AND EQUIPMENT

- A. Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

2.2 COMPATIBILITY

- A. Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

- A. General:
 - 1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
 - 2. Do not allow accumulation of scrap, debris waste material, and other items not required for construction of the work.
 - 3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the project site.
 - 4. Provide adequate storage for all items awaiting removal from the project site, observing requirements for fire protection and protection of the ecology.
- B. Site:
 - 1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
 - 2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site. Restack, tidy, or otherwise service arrangements to meet the requirements of this section.
 - 3. Maintain the site in a neat and orderly condition at all times.
- C. Structures:
 - 1. Weekly, and more often if necessary, inspect the structures and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
 - 2. Weekly, and more often if necessary, sweep interior spaces clean.
 - a. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a hand-held broom.
 - 3. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the necessary cleanliness.

4. Following the installation of finish floor materials, clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in which finish materials are installed.
 - a. "Clean", for the purpose of this subparagraph shall be interpreted as meaning free from foreign material which, in the opinion of the Architect, may be injurious to the finish floor material.

3.2 FINAL CLEANING

- A. "Clean", for the purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provide by skilled cleaners using commercial quality building maintenance equipment and materials.
- B. Prior to completion of the work, remove from the project site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in this section.
- C. Site:
 1. Unless otherwise specifically directed by Architect, broom clean paved areas on the site and public paved areas adjacent to the site.
 2. Completely remove resultant debris.
- D. Structures:
 1. Exterior:
 - a. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
 - b. Remove all traces of splashed materials from adjacent surfaces.
 - c. If necessary to achieve a uniform degree of cleanliness, hose down the exterior of the structures.
 - d. In event of stubborn stains not removable with water, Architect may require light sandblasting or other cleaning at no additional cost to the Owner.
 2. Interior:
 - a. Visually inspect interior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
 - b. Remove all traces of splashed material from adjacent surfaces.
 - c. Remove paint droppings, spots, stains, and dirt from finished surfaces.
 3. Glass: Clean inside and outside.
 4. Polished Surfaces: To surfaces requiring routine application of buffed polish, apply the polish recommended by the manufacturer of the material being polished. This does not apply to resilient flooring surfaces. Reference SECTION 09 65 00 - RESILIENT FLOORING for cleaning of resilient flooring.
- E. Special floor/base final cleaning requirements:
 1. Contractor shall coordinate with the Owner's housekeeping department for preparing the surfaces for final cleaning by the Contractor and protective coatings installed by the Owner.
 2. Protection after final treatment until date of Substantial Completion shall be the responsibility of the Contractor.
 3. All repairs or re-application required as a result of damage caused by the Work shall be the responsibility of the Contractor as directed by the Owner.
- F. Schedule final cleaning, as approved by the Architect, to enable the Owner to accept a completely clean work.

3.3 CLEANING DURING OWNER'S OCCUPANCY

- A. Should the Owner occupy the work, or any portion thereof, prior to its completion by the Contractor and acceptance by the Owner, responsibilities for interim and final cleaning shall be as determined by the Architect in accordance with the General Conditions of the Contract for Construction.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Administrative and procedural requirements for project closeout, including but not limited to:
 - 1. Inspection procedures.
 - 2. Project record document submittal.
 - 3. Operating and maintenance data submittal, including training sessions for equipment and systems.
 - 4. Submittal of warranties.
 - 5. Submittal of spare parts and maintenance materials.
- B. Related Requirements:
 - 1. Section 01 11 00 - Summary of Work: record drawings.
 - 2. Section 01 33 23 - Shop Drawings, Product Data and Samples.
 - 3. Section 01 74 13 - Cleaning: final cleaning.
 - 4. Section 08 71 00 - Door Hardware: keys and keying schedule.

1.2 SUBSTANTIAL COMPLETION

- A. General: Substantial Completion is defined in Paragraph 9.8.1 (A201 and A201/CMA) of the General Conditions.
- B. Preliminary Procedures: Before requesting inspection for certification of substantial completion, complete the following. List exceptions in the request.
 - 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100% completion for the portion of the work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
 - a. If 100% completion cannot be shown, include a list of incomplete items, the value of incomplete construction and reasons the work is not complete.
 - 2. Advise Owner of pending insurance change-over requirements.
 - 3. Submit specific warranties, maintenance agreements, final certifications and similar documents.
 - 4. Obtain and submit releases enabling the Owner unrestricted use of the work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
 - 5. Submit record drawings, maintenance manuals and similar final record information.
 - 6. Deliver tools, spare parts, extra stock and similar items.
 - 7. Make final change-over of permanent locks and transmit keys and keying schedule to the Owner. Advise the Owner's personnel of change-over in security provisions.
 - 8. Complete start-up testing of systems, and training sessions for Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups and similar elements.
 - 9. Complete final clean-up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.
- C. Inspection Procedures: On receipt of a request for inspection, the Architect will either proceed with inspection or advise the Contractor of unfulfilled requirements. The Architect will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed or corrected before the certificate will be issued.
 - 1. Architect will repeat the inspection when requested and assured that the work has been substantially completed.
- D. Results of the completed inspection will form the basis of requirements for final acceptance.

1.3 FINAL ACCEPTANCE

- A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, submit the following. List exceptions in the request.

1. Final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
 2. Updated final statement, accounting for final additional changes to the contract sum.
 3. Certified copy of the Architect's final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
 4. Consent of surety to final payment.
 5. Final Liquidated Damages settlement statement.
 6. Evidence of final, continuing insurance coverage complying with insurance requirements.
 7. Evidence of Compliance with Requirements of Governing Authorities
 - a. Certificate of Occupancy.
 - b. Certificates of Inspection required for mechanical and electrical systems.
 8. Operation and Maintenance Data: Under provisions of SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA.
 9. Warranties and Bonds: Under provisions of SECTION 01 78 30 - WARRANTIES AND BONDS.
 10. Project Record Documents: Under provisions of SECTION 01 78 39 - PROJECT RECORD DOCUMENTS.
 11. Spare Parts and Maintenance Materials: Under provisions of SECTION 01 78 40 - SPARE PARTS, OVERAGES AND MAINTENANCE MATERIALS.
 12. Keys and Keying Schedule: Under provisions of SECTION 08 71 00 - DOOR HARDWARE.
 13. Evidence of Payment and Release of Liens: In accordance with General Conditions of the Contract for Construction.
 14. Evidence of Payment of Debts and Claims: In accordance with General Conditions of the Contract for Construction.
 15. Certificate of Project Compliance: Required under provisions of Texas Administrative Code (TAC), Chapter 61, 1036(c)(3)(F). Form developed by the Texas Education Agency (TEA). **See form attached to the end of this Section.**
 16. Certification of Asbestos and Lead Free Project: The Contractor shall submit to the Architect a letter addressed to the Owner certifying that no materials used in the construction of this project contain lead nor asbestos materials in excess of amounts allowed by local/state standards, laws, codes, rules and regulations, Federal Environmental Protection Agency (EPA) standards and the Federal Occupational Safety and Health Administration (OSHA) standards, whichever are most restrictive. Certification shall further state that should lead or asbestos fibers be found in this project in concentrations greater than the allowed amounts, that the Contractor shall be responsible for determining which materials contain the lead or asbestos fibers and shall take corrective action to remove those materials from the project at no additional cost to the Owner. Final payment shall not be made until this letter of certification has been received.
- B. Re-inspection Procedures: Architect will re-inspect the work upon receipt of notice that the work, including inspection list items from earlier inspections, has been complete, except items whose completion has been delayed because of circumstances acceptable to the Architect.
1. Upon completion of re-inspection, the Architect will advise the Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 2. If necessary, re-inspection will be repeated.
- C. Re-inspection Fees: Should status of completion of work require re-inspection by Architect due to failure of work to comply with Contractor's claims on initial inspection, Owner will deduct the amount of Architect and appropriate consultants compensation for re-inspection services from final payment to Contractor. The reimbursement transaction shall be executed by change order to the contract.

1.4 CLOSEOUT PROCEDURES

- A. Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in one set heavy-duty 3-1/2", three-ring vinyl-covered binder, with identification on front and spine. Include the following types of information:
1. Emergency instructions.
 2. Spare parts list.
 3. Copies of warranties.
 4. Wiring diagrams.
 5. Recommended "turn around" cycles.
 6. Inspection procedures.
 7. Shop drawings.
 8. Fixture lamping schedule.

- B. Shop Drawings: Keep and maintain a full set of submittals throughout the construction phase to be submitted to the Architect with other close-out documents for delivery to the Owner for his permanent record. Set of submittals shall be delivered to the Architect in cardboard file boxes with string and button type closures. Organize submittals by CSI divisions, utilizing neatly labeled pressboard dividers to separate the sections. Neatly label short end of box with project name, contents and duration of construction.
- C. Operating and Maintenance Training Sessions: Prepare a written agenda of items to be covered at each training session. Attendance by Owner's operating and maintenance personnel is mandatory. Notify Owner not less than 48 hours prior to scheduled training sessions.
1. Arrange for each installer of equipment and systems that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:
 - a. Maintenance manuals.
 - b. Record documents.
 - c. Spare parts and materials.
 - d. Tools.
 - e. Lubricants.
 - f. Fuels.
 - g. Identification systems.
 - h. Control sequences.
 - i. Hazards.
 - j. Cleaning.
 - k. Warranties and bonds.
 - l. Maintenance agreements and similar continuing commitments.
 2. Training sessions shall consist of not less than five days of not less than four hours each day. A copy of maintenance manuals for equipment or system being demonstrated shall be on hand during training session. As part of instruction for operating equipment, demonstrate the following procedures:
 - a. Start-up.
 - b. Shutdown.
 - c. Emergency operations.
 - d. Noise and vibration adjustments.
 - e. Safety procedures.
 - f. Economy and efficiency adjustments.
 - g. Effective energy utilization.
 3. Training sessions shall be conducted for:
 - a. Folding panel partitions/folding glass panel partitions.
 - b. Food service equipment.
 - c. ISIMET System.
 - d. HVAC systems.
 - e. Energy management controls.
 - f. Public address system.
 - g. Fire alarm and smoke detection systems.
 - h. Media retrieval system.
 - i. Irrigation system.
 4. Demonstration and Training DVDs
 - a. General: Engage a qualified commercial photographer to record demonstration and training DVDs. Record each training session separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids.
 - b. Digital Format: Provide high-quality DVD color recording.
 - c. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and training. Display continuous running time.
 - d. Narration: Describe scenes by audio narration by microphone while being recorded. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.
 - e. Transcript: Provide a typewritten transcript of the narration. Display images and running time captured from recording opposite the corresponding narration segment.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

CERTIFICATION OF PROJECT COMPLIANCE

Distribution to:

District	_____	Architect/Engineer	_____
Contractor	_____	Texas Education Agency	_____
Other	_____	Building Department	_____

1. PROJECT INFORMATION:
(name, address)

ARCHITECT/ENGINEER:

CONTRACTOR/CM:

PROJECT NUMBER:

CONTRACT DATE:

DISTRICT:

DATE DISTRICT AUTHORIZES PROJECT:

BRIEF DESCRIPTION OF PROJECT:

2. CERTIFICATION OF DESIGN AND CONSTRUCTION

The intent of this document is to assure that the school district has provided to the architect/engineer the required information and the architect/engineer has reviewed the School Facilities Standards as required by the State of Texas, and used his/her reasonable professional judgment and care in the architectural/engineering design and that the contractor has constructed the project in a quality manner in general conformance with the design requirements and that the school district certifies to project completion.

3. The District certifies that the enrollment projections, educational specifications and objectives of this facility along with the identified building code to be used have been provided to the architect/engineer.

DISTRICT: BY:

DATE:

4. The Architect/Engineer certifies the above information was received from the school district, and that the building(s) were designed in accordance with the applicable building codes. Further, the facility has been designed to meet or exceed the design criteria relating to space (minimum square footage), educational adequacy, and construction quality as contained in the School Facilities Standards as adopted by the State Board of Education, July 1992, and as provided by the district.

ARCHITECT/ENGINEER: BY:

DATE:

5. The Contractor/CM certifies that this project has been constructed in general conformance with the construction documents as prepared by the architect/engineer listed above.

CONTRACTOR/CM: BY:

DATE:

6. The District certifies completion of the project (as defined by the architect/engineer and contractor).

DISTRICT: BY:

DATE:

INSTRUCTIONS FOR COMPLETION OF “CERTIFICATION OF PROJECT COMPLIANCE” FORM

Section 1. Identify the following:

- name and address of the school facility
- the Architect/Engineer and Contractor
- the school district’s project number (if applicable)
- the date of execution of the construction contract
- name, address, and telephone number of the school district
- the date that the school district authorized the superintendent to hire an architect/engineer
- scope of the project.

Section 2. This section outlines the intent of the document. No action required.

Section 3. This section is to be executed by the school district upon transmittal of the information (as listed) to the architect/engineer and is to remain in the custody of the school district throughout the entire project.

Section 4. This section is to be executed by the architect/engineer upon completion of the plans and specifications and in conjunction with the completion of the plan review for code compliance (ref. 19 TAC §61.104, School Facilities Standards) and returned to the school district’s files.

Section 5. This section is to be executed by the contractor upon substantial completion of the project and retained in the school district’s files.

Section 6. This section is to be executed by the school district upon acceptance and occupancy of the project.

NOTE: DO NOT SUBMIT THIS DOCUMENT TO THE TEXAS EDUCATION AGENCY. The school district will retain this document in their files indefinitely until review and/or submittal is required by representatives of the Texas Education Agency.

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Digital Manual Only.
 - 1. Format and content of manuals.
 - 2. Instruction of Owner's personnel.
 - 3. Schedule of submittals.
- B. Related Requirements:
 - 1. Section 01 33 23 - Shop Drawings, Product Data, and Samples.
 - 2. Section 01 45 00 - Quality Control: Manufacturer's instructions.
 - 3. Section 01 77 00 - Closeout Procedures.
 - 4. Section 01 78 30 - Warranties and Bonds.
 - 5. Section 01 78 39 - Project Record Documents.
 - 6. Individual Specifications Sections: Specific requirements for operation and maintenance data.

1.2 QUALITY ASSURANCE

- A. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

1.3 FORMAT

- A. Submit operation and maintenance manuals on digital media acceptable to Owner and Architect. Enable reviewer comments on draft submittals.
- B. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated Correlate data into related consistent groupings.
- C. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; list title of project identify subject matter of contents.
- D. Arrange content by systems, under section numbers and sequence of table of contents of this project manual.

1.4 SUBMITTALS

- A. Submit copy of preliminary draft or proposed formats and outlines of contents before start of work. Architect/Engineer will review draft and return with comments.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within 10 days after acceptance.
- C. Submit completed files in final form 15 days prior to final inspection. Files will be returned after final inspection, with Architect/Engineer comments. Revise content of documents as required prior to final submittal.
- D. Submit revised volumes of data in final format within 10 days after final inspection.

1.5 CONTENTS, EACH VOLUME

- A. Table of Contents: Provide title of project; names, addresses, and telephone numbers of Architect/Engineer and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.
- B. For Each Product or System: List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- C. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- D. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use project record documents as maintenance drawings.
- E. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in SECTION 01 45 00 - QUALITY CONTROL.
- F. Warranties and Bonds: Bind in copy of each.

1.6 ELECTRONIC MANUAL FOR MATERIALS AND FINISHES

- A. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Provide information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- C. Moisture-protection and Weather-exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.
- D. Additional Requirements: As specified in individual specifications sections.
- E. Provide a listing in table of contents for design data, with tabbed fly sheet and space for insertion of data.

1.7 ELECTRONIC MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Give function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- B. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications.
- C. Include as-installed color coded wiring diagrams.
- D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Provide servicing and lubrication schedule, and list of lubricants required.
- G. Include manufacturer's printed operation and maintenance instructions.
- H. Include sequence of operation by controls manufacturer.

- I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Provide as-installed control diagrams by controls manufacturer.
- K. Provide Contractor's coordination drawings, with as-installed color coded piping diagrams.
- L. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- M. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- N. Additional Requirements: As specified in individual specifications sections.
- O. Provide a listing in table of contents for design data, with tabbed fly sheet and space for insertion of data.

1.8 INSTRUCTION OF OWNER PERSONNEL

- A. Before final inspection, instruct Owner's designated personnel in operation, adjustment, and maintenance of products, equipment, and systems, at agreed upon times. For equipment requiring seasonal operation, perform instructions for other seasons within six months.
- B. Use operation and maintenance manuals as basis of instruction. Review contents of manual with personnel in detail to explain all aspects of operation and maintenance.
- C. Prepare and insert additional data in operation and maintenance manual when need for such data becomes apparent during instruction.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

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SECTION 01 78 30

WARRANTIES AND BONDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Preparation and submittal of warranties and bonds.
 - 2. Schedule of submittals.
- B. Related Requirements:
 - 1. General Conditions of the Contract for Construction: Performance Bond and Labor and Material Payment Bonds, Warranty, and Correction of Work.
 - 2. Section 01 77 00 - Closeout Procedures.
 - 3. Section 01 78 23 - Operation and Maintenance Data.
 - 4. Section 01 78 39 - Project Record Documents.
 - 5. Individual Specifications Sections: Warranties and bonds required for specific products or work.

1.2 FORM OF SUBMITTALS

- A. Bind in one heavy-duty 8-1/2" x 11" black, three-ring binder, with hardback, cleanable, plastic cover.
- B. Label cover of each binder with typed or printed title WARRANTIES AND BONDS, with title of project; name, address and telephone number of Contractor; and name of responsible principal.
- C. Table of Contents: Neatly typed, in the sequence of the table of contents of the project manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- D. Separate each warranty or bond with index tab sheets keyed to the table of contents listing. Provide full information, using separate typed sheets as necessary. List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

1.3 PREPARATION OF SUBMITTALS

- A. Obtain warranties and bonds, executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the date of substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.

1.4 TIME OF SUBMITTALS

- A. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
- B. Make other submittals within 10 days after date of substantial completion, prior to final application for payment.
- C. For items of work when acceptance is delayed beyond date of substantial completion, submit within ten days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Maintenance and submittal of record documents and samples.
- B. Related Requirements:
 - 1. General Conditions of the Contract for Construction: Documents at the site.
 - 2. Section 01 33 23 - Shop Drawings, Product Data, and Samples.
 - 3. Section 01 77 00 - Closeout Procedures.
 - 4. Section 01 78 23 - Operation and Maintenance Data.
 - 5. Individual Specifications Sections: Manufacturer's certificates and certificates of inspection.

1.2 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. In addition to requirements in General Conditions, maintain at the site for Owner one record copy of:
 - 1. Contract drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change orders and other modifications to the contract.
 - 5. Reviewed shop drawings, product data, and samples.
 - 6. Field test records.
 - 7. Inspection certificates.
 - 8. Manufacturer's certificates.
- B. Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage for record documents and samples.
- C. Label and file record documents and samples in accordance with section number listings in table of contents of this project manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- D. Maintain record documents in a clean, dry and legible condition. Do not use record documents for construction purposes.
- E. Keep record documents and samples available for inspection by Architect.

1.3 RECORDING

- A. Record information on a set of opaque drawings, and in a copy of a project manual. All changes made in these drawings in connection with the final construction and installation shall be neatly made in red ink on the prints.
- B. Provide felt tip marking pens, maintaining separate colors for each major system, for recording information.
- C. Contractor shall include with the record documents, all changes and modifications made by addenda, change orders, supplementary instructions, or other forms of documentation, written or verbal, which alter the documents.
- D. Record information concurrently with construction progress. Do not conceal any work until required information is recorded.
- E. Contract drawings and shop drawings: Legibly mark each item on the drawings to record actual construction, including:
 - 1. Measured depths of elements of foundation in relation to finish first floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.

4. Field changes of dimension and detail.
 5. Changes made by addenda and modifications.
 6. Details not on original contract drawings.
 7. References to related shop drawings and modifications.
- F. Specifications: Legibly mark each item in the specifications to record actual construction, including:
1. Manufacturer, trade name, and catalog number of each product actually installed, particularly optional items and substitute items.
 2. Changes made by addenda and modifications.
- G. Other Documents: Maintain manufacturer's certifications, inspection certifications, field test records, and other documents required by individual specifications sections.
- H. Maintain these documents to reflect the current conditions of the work. Changes shall be reviewed on a monthly basis with the Architect's representative. The Contractor's updating of the "installed condition drawings" shall be a prerequisite to the monthly review of the Contractor's payment request by the Architect's representative.

1.4 SUBMITTALS

- A. At contract closeout, deliver record documents and samples under provisions of SECTION 01 77 00 - CLOSEOUT PROCEDURES.
- B. Transmit with cover letter in duplicate, listing:
1. Date.
 2. Project title and number.
 3. Contractor's name, address, and telephone number.
 4. Number and title of each record document.
 5. Signature of Contractor or authorized representative.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01 78 40

SPARE PARTS, OVERAGES AND MAINTENANCE MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

- A. Requirements Includes:
 - 1. Products required.
 - 2. Storage and delivery of products.
- B. Related Requirements:
 - 1. Section 01 66 00 - Product Storage and Handling Requirements.
 - 2. Section 01 77 00 - Closeout Procedures.
 - 3. Section 01 78 23 - Operation and Maintenance Data.
 - 4. Individual Specifications Sections: Specific spare parts and materials required.

1.2 PRODUCTS REQUIRED

- A. Provide quantities of products, spare parts, maintenance tools, and maintenance materials specified in individual sections to be provided to Owner, in addition to that required for completion of work.
- B. Products: Identical to those installed in the work. Include quantities in original purchase from manufacturer to avoid variations in manufacture.

1.3 STORAGE, MAINTENANCE

- A. Store products with products to be installed in the work, under provisions of SECTION 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS.
- B. When adequate, secure storage facilities are available at site, capable of maintaining conditions required for storage and not required for contract work or storage, or for Owner's needs, spare products may be stored in available space.
- C. Maintain spare products in original containers with labels intact and legible, until delivery to Owner.

1.4 DELIVERY

- A. Coordinate with Owner: Deliver and unload spare products to Owner at the Owner's Maintenance Facility and obtain receipt prior to final payment.
- B. For portions of project accepted and occupied by Owner prior to substantial completion, deliver a proportional part of spare products to Owner; obtain receipt.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

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SECTION 03 11 13

STRUCTURAL CONCRETE FORMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Shoring, formwork and re-shoring of structure.
 - 2. Furnish, install and removal of concrete formwork.

1.2 REFERENCES (Latest Edition)

- A. Codes and Specifications
 - 1. American Concrete Institute (ACI)
 - a. ACI 117, Specification for Tolerances for Concrete Construction and Materials
 - b. ACI 301, Specifications for Structural Concrete
 - c. ACI 318, Building Code Requirements for Structural Concrete
 - d. ACI 347R, Guide to Formwork for Concrete
 - 2. Concrete Reinforcing Steel Institute (CRSI)
 - a. Manual of Standard Practice
 - 3. American Society for Testing Materials (ASTM)
 - a. ASTM C203, Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation
 - b. ASTM D1621, Standard Test Method for Compressive Properties of Rigid Cellular Plastics
 - c. ASTM D1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)

1.3 SUBMITTALS

- A. Shop Drawings:
 - 1. Submit shop drawings for formwork.
 - 2. Submit description of shoring, re-shoring and backshoring procedures, indicating magnitude of loads assumed, signed and sealed by licensed design engineer
 - 3. Submit size and layout of sleeves and openings in structural members, required by trades, prior to releasing reinforcing, and formwork shop drawings for fabrication.
- B. Construction Joints: Submit diagrams of construction joints.
- C. Form Ties: For Architecturally exposed concrete, submit layout of form tie spacing.
- D. Product Data:
 - 1. Form release agent
 - 2. Fiberboard void forms
 - 3. Void retainer panels
 - 4. Vapor retarder
- E. Samples:
 - 1. Rustication forms
 - 2. Reglet
 - 3. Dove-tailed anchor slots

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials off ground and protected from weather.
 - 1. Prevent warpage, twisting and excessive moisture gain of wood materials.
 - 2. Discard damaged or deformed materials.
- B. Protect smooth faces of form liner materials from abrasion, denting or scarring during handling.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Design, erect, shore, brace and maintain formwork according to ACI 301 to withstand vertical, lateral, static, dynamic and construction loads applied prior to concrete structure reaching adequate strength to support such loads.
- B. Limit form deflections to provide smooth, straight surfaces without unsightly bulges and deformations.
- C. Limit form deformations for architecturally exposed surfaces to 0.0025 times the span of each component (facing material, studs and walers).

2.2 MATERIALS

- A. Wood forms for unexposed concrete surfaces: No. 2 Southern Yellow Pine or Douglas Fir dressed to uniform and smooth contact surfaces.
- B. Wood forms for concrete surfaces exposed to view: Commercial Standard Douglas Fir concrete form plywood, moisture resistant, not less than 5 plies, and minimum thickness of 9/16 inch. Line forms with one of the following:
 - 1. Plywood: Commercial Standard Douglas Fir, concrete form, exterior, 3 ply, not less 1/4 inch thick with one smooth face.
 - 2. Fiberboard: Treated, hard pressed fiberboard, moisture resistant, not less than 3/16 inch thick with one smooth side.
- C. Void retainers:
 - 1. Precast Concrete Panels. 1 1/2 inches thick, 3000 psi lightweight or normal weight concrete, reinforced with 4x4-W1.4 welded wire mesh.
 - 2. Lightweight, ribbed, high density or high molecular weight polyethylene or panels specially made to prevent migration of backfill soil under foundation elements. Required minimum panel height: 14 inches for 8 inch void space and smaller
 - a. Example product: Motzblock distributed by CAM-Crete, LLC
 - b. Example product: SureRetainer by VoidFormProducts
 - 3. Extruded polystyrene foam panel: Two inch minimum thickness with square edges. Minimum compressive strength of 25 psi (ASTM D1621) and minimum flexural strength of 60 psi (ASTM C203). Example products:
 - a. Foamular 250 Rigid Foam Insulation by Owens Corning
 - b. Styrofoam Highload 40 Extruded Polystyrene Insulation by Dow

2.3 COMPONENTS

- A. Rustications: steel, polyvinyl chloride or milled and sealed white pine.
- B. Dove-tailed anchor slots: compatible with specified dove-tailed anchors for masonry veneer.

2.4 MANUFACTURED UNITS

- A. Fiberboard void forms (void boxes): manufactured using corrugated paper material with water resistant fiberboard material exterior, capable of supporting weight of wet concrete without crushing but non-durable in long-term (deteriorates over time with absorption of moisture). Void forms to be laminated using moisture resistant adhesive.
 - 1. Provide premanufactured shapes required (rectangular, etc.)
 - 2. Provide special shapes adjacent to round or skewed components.
 - a. Do not cut fiberboard void forms in field.
 - 3. Provide caps at each end of units.
 - 4. Provide a layer of protective cover board over void forms to distribute working load and protect void forms from puncture and other damage during concrete placement.
 - a. Example cover board: 1/4 inch minimum thickness hardboard/fiberboard

2.5 ACCESSORIES

- A. Form ties: bolt rods or patented devices of sufficient strength to withstand pressure due to wet concrete (3000 pounds minimum tensile strength); adjustable in length, and removable to depth of at least 1 inch from face of concrete.
 - 1. Equip ties for exposed concrete surfaces with plastic cones 5/8 inch in diameter.
 - 2. Do not use wire ties, or makeshift ties that leave unsightly marks or depressions on face of concrete.
- B. Form release agent:
 - 1. Does not bond with, stain, or adversely affect concrete surfaces.
 - 2. Meets acceptable air quality standards.

PART 3 - EXECUTION

3.1 DESIGN AND CONSTRUCTION

- A. Design formwork for concrete elements to have correct dimension, shape, alignment, elevation, and position with dimensional tolerances conforming to ACI 117. Reference ACI 347R.
- B. Design formwork to safely support vertical and lateral loads until such loads can be supported by concrete structure. Carry vertical and lateral loads to ground by formwork system or by in-place construction of adequate strength.
- C. Form sides of concrete elements unless specifically noted or shown otherwise.
 - 1. Dimensional tolerances to conform to ACI 117.
 - 2. Repair bulges, offsets and formwork conditions that would cause beam sides to become skewed or wider than void box bottom forms prior to placing concrete.
- D. Construct forms to required shapes, lines and dimensions; provide necessary studs, walers, ties, centering, molds and supports.
 - 1. Install forms sufficiently tight to prevent leakage of mortar.
 - 2. Construct forms to be easily removable without damage to finished surfaces.
 - 3. Provide forms without unsightly marks or deformations on exposed faces.
 - 4. Thoroughly clean forms of concrete laitance before re-use.
 - 5. Provide clean-outs at base of vertical forms for removal of foreign materials before concrete placement.
- E. Tying of forms: provide sufficient form ties to prevent bulging or collapse of forms under weight of wet concrete.
 - 1. Place ties in uniform and orderly pattern.
 - 2. Lubricate ties to prevent bonding with concrete.
- F. Special features: place in forms any wood strips, blocking, molding, and liners necessary to produce required shapes.
 - 1. Attach feature strips to forms in a manner that will not leave unsightly marks on exposed concrete surfaces.
 - 2. Coat wood strips, blocking and molding with form sealer.
 - 3. Provide 3/4 inch chamfer strips along edges of permanently exposed concrete unless noted otherwise.
 - 4. Provide dove-tailed anchor slots coordinated with masonry.
- G. Coatings:
 - 1. Coat contact surfaces of wood forms with form release agent before each use and before placing reinforcement.
 - 2. Apply form release agent per manufacturer's recommendations.
 - 3. Do not allow excess release agent to accumulate in forms or to contact hardened concrete against which fresh concrete will be placed.
 - 4. Remove release agent from reinforcement before placing concrete.
- H. Fiberboard Void Boxes:
 - 1. Ensure subgrade is clean and dry before installing void boxes.
 - 2. Place void cartons tightly end-to-end.
 - 3. Place and arrange void cartons so that horizontal concrete surfaces that would otherwise be in contact with soil are protected by void boxes. Protect cartons from rain and mud.

4. Secure void cartons firmly in place so that position will not be altered by activities of workmen or placement of concrete. Secure with waterproof tape.
5. Do not cut fiberboard void box components in field.
6. Replace partially or wholly collapsed cartons.
7. Install vapor retarder in accordance with ASTM E1643
8. Install protective cover board according to manufacturer's instructions.

I. Void Retainers:

1. Prior to installing retainers, inspect void spaces to ensure voids are intact and that concrete or other material has not entered void space.
 - a. Where void space is not intact, remove excess concrete or other material prior to installing void retainers.
2. Install void retainers as shown or in accordance with manufacturer's written instructions, including overlap on side of beam or wall and penetration into subgrade. Where discrepancies occur, the most stringent shall govern.
3. Cut retainer material for tight fit at corners. Tape corners to ensure panels remain accurately in place during backfilling and that backfill soil does not enter void space.
4. Monitor performance of retainer panels continuously during backfilling. If panels shift, or soil enters void space, stop work and adjust installation to assure satisfactory performance.
5. Void height tolerance: plus 2 inches, minus 0 inches of required height.

3.2 REMOVAL OF FORMS

- A. Remove forms completely, unless specifically required otherwise.
- B. Remove forms carefully to avoid damage to concrete surfaces.
- C. Do not remove forms until concrete is adequately set.
 1. Clamps and tie rods may be loosened after 24 hours following placement of concrete.
 - a. Maintain sufficient ties to hold forms in place.
 - b. Withdraw through-wall ties toward the inside (or unexposed) face of walls and beams.
 - c. Prevent spalling during tie removal.
 2. Use concrete strength tests as evidence that concrete has adequately set for form removal.
 - a. Minimum strength is 75 percent of design strength.
- D. Remove forms sequentially and in small units to prevent shock, overload or undue eccentricity in structure. Do not store materials or place heavy equipment on structures of which forms have been removed unless concrete strength is equal to design strength, or re-shores are installed. Remove forms in a manner that does not require a large portion of the structure to be self-supporting (i.e. a full bay of framing). Install re-shores immediately as form removal progresses.
- E. Do not remove forms until supporting structures are permanently in place and full strength.
- F. Re-shore structure required to support subsequent construction. Install re-shores plumb and tight to structure and concentric with form supports. Provide re-shore materials with safe load capacity sufficient for transfer of required loads. Re-shore sufficient levels of structure so that imposed loads due to forms, wet concrete and construction loads do not exceed the combined live load capacity of levels to which re-shores extend. Space re-shores sufficiently close together to provide uniform distribution of load to supporting structure.

END OF SECTION

SECTION 03 11 15

EXPANDED POLYSTYRENE FOAM BLOCK FORMWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Sections: 03 11 13 Structural Concrete Forming

1.2 REFERENCES (Latest Edition)

- A. ASTM D6817 - Standard Specification for Rigid Cellular Polystyrene Geofoam

1.3 SUBMITTALS

- A. Shop Drawings: Show layout and dimensions of Expanded Polystyrene (EPS) foam block fill areas. Indicate location, size, and elevation. Provide cross section of area indicating height and depth. Provide plan view of each layer of foam block with each part identified and dimensioned. Show attachment method and configuration.
- B. Product Data for listed materials including:
 - 1. Physical properties in compliance with ASTM D6817 Type EPS15, unless noted otherwise.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver EPS foam labeled with material type.
- B. Prior to installation, store above ground and protected from moisture and sunlight.
- C. Do not expose product to open flame or other ignition sources.
- D. Do not deliver product to Project site before installation time.
- E. Complete installation and concealment of product in each area of construction as rapidly as possible.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

- A. Molded, Rigid Cellular Expanded Polystyrene Blocks: Comply with manufacturer's requirements, conform to ASTM D6817.
- B. Adhesive: non-solvent based polyurethane adhesive.
- C. GeoGripper Plates: Use to restrain EPS Geofoam from moving laterally in layer over layer applications.
 - 1. Made of galvanized or stainless steel with two-sided multi-barbed design capable of piercing geofoam.
- D. Treat EPS foam blocks with a tested and proven termite treatment by manufacturer for below grade applications, 3 year minimum field exposure. Use EPA registered treatment meeting requirements of ICC ES EG239 and recognized in an ICC ES report.

2.2 FABRICATION

- A. Fabricate blocks square and true to dimension.
 - 1. Factory cut blocks for delivery to jobsite and installation without need for excessive field cutting.
 - 2. Ramp areas: fabricate block with slope consistent with ramp slope requirements.

- B. Marking and Identification: Mark blocks with Section Layer I.D. letter and part number identification corresponding to shop drawing layout and EPS schedule.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's EPS foam product data; including technical bulletins.

3.2 STORAGE

- A. Ballast: Ballast EPS foam to prevent displacement by wind or high water conditions during storage and placement.

3.3 GENERAL INSTALLATION

- A. Examine supporting substrate and abutting structural framing for compliance with requirements for elevations, installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions are corrected.
- B. Install system in compliance with Contract Documents and installation/shop drawings as prepared by manufacturer.
- C. Blocks to be adhered to base slab and to one another along horizontal surface with continuous minimum 1 inch wide strip of adhesive. Adhesive to be placed 2 inches from perimeter of each side of each block and at 8 inches on center each way.
- D. Installation to be completed by experienced craftsmen trained to do this type of Work.

3.4 PROTECTION & SAFETY

- A. Protection: Protect installed product and finish surfaces from damage during construction.
- B. Do not weld with torch in same room as installed or stored EPS. Protect EPS against ignition.

END OF SECTION

SECTION 03 15 19

CAST-IN ANCHORS AND EMBEDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Steel assemblies to be embedded
 - 2. Anchors
 - 3. Inserts

1.2 REFERENCES (Latest Edition)

- A. Codes and Specifications
 - 1. Concrete Reinforcing Steel Institute (CRSI)
 - a. Manual of Standard Practice.
 - 2. American Institute of Steel Construction (AISC)
 - a. AISC 360, Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.
 - 3. American Welding Society (AWS)
 - a. AWS D1.1, Structural Welding Code - Steel.
 - b. AWS D1.4, Structural Welding Code - Reinforcing Steel.
 - c. AWS D1.8, Structural Welding Code – Seismic Supplement
 - 4. American Concrete Institute (ACI)
 - a. ACI 318, Building Code Requirements for Reinforced Concrete.
 - b. SP-066, ACI Detailing Manual
 - 5. American Society for Testing and Materials (ASTM)
 - a. ASTM A29, Standard Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought.
 - b. ASTM A36, Standard Specification for Carbon Structural Steel.
 - c. ASTM A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - d. ASTM A283, Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
 - e. ASTM A307, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
 - f. ASTM A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - g. ASTM A706, Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
 - h. ASTM A1064, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
 - i. ASTM A1011, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
 - j. ASTM F3125, Standard Specification for High Strength Structural Bolts, Steel and Alloy Steel, Heat Treated, 120 ksi (830MPa) and 150 ksi (1040 MPa) Minimum Tensile Strength, Inch and Metric Dimensions.

1.3 SUBMITTALS

- A. Product Data
 - 1. Submit manufacturer's data indicating product compliance for the following:
 - a. Headed stud anchors
 - b. Deformed bar anchors
 - c. Rust inhibitor
 - d. Zinc coating
 - e. Threaded inserts
 - f. Anchor slots
- B. Shop Drawings:
 - 1. Submit shop and installation drawings for review by Architect, including:

- a. Shop and field connection details
 - b. Material grades and sizes
 - c. Details of fabrication
2. Do not begin fabrication prior to review of shop drawings.
3. Review of shop drawings is for member sizes, spacings, detail, and general compliance with Contract Documents only.
4. Material quantities, lengths, fit, verification of job conditions, and coordination with other trades are responsibility of Contractor.

C. When requested by Owner or Architect, submit welders' certifications.

1.4 QUALITY ASSURANCE

A. Qualifications

1. Fabricator:
 - a. Minimum of 3 years of experience in related or similar work.
2. Welders:
 - a. Certified for type of welding required within previous 6 months.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store fabricated assemblies and inserts under cover and off ground to protect against corrosion prior to placement.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel

1. W Shapes and WT's: ASTM A992
2. Angles, Channels, Plates and Rods: ASTM A36.
3. Steel straps: ASTM A283 or A1011.
4. Anchor rods: ASTM F1554 of required grades, with regular hexagon nuts and carbon steel washers

B. Reinforcing Bars

1. Deformed Bars: ASTM A615 Grade 60.
2. Welded Wire Reinforcement: Conform to ASTM A1064.
3. Bars to be welded: ASTM A706 Grade 60.

C. Fusion Welded Anchors

1. Headed Stud Anchors: Conform to ASTM A29, Grades 1010 through 1020, Type B, with sizes and lengths as shown, and conforming to AWS D1.1, Section 7.
2. Deformed Bar Anchors: Low carbon steel, conforming with ASTM A1064, with sizes and lengths as shown.
 - a. Example product: Type DA, as manufactured by Blue Arc Stud Welding Division of Erico Industries.

D. Welding Electrodes:

1. Conform to AISC and AWS Specifications
2. Use E70 electrodes unless noted otherwise.
3. Use E80 electrodes for welding of ASTM A706 rebar.

E. Coatings

1. Rust Inhibitor:
 - a. Example product: Hi-Build Epoxoline as manufactured by Tnemec Co.
2. Hot-dip Galvanizing: Conform to ASTM A153.
3. Cold Galvanizing:
 - a. Example product: Galvilite as manufactured by ZRC WORLDWIDE

F. Inserts

1. Threaded Inserts: Rated for tensile strength of bolt size required (ultimate strength).

2. Anchor Slots to receive inserts for anchoring masonry units, cast stone, and marble to concrete: One inch wide, 7/8 inch deep, continuous No. 24 gauge, galvanized sheet steel, dovetailed slots, complete with felt lining.
 - a. Example manufacturer: Hohmann & Barnard, Inc., New York, N.Y.
3. Miscellaneous: PVC pipes, or other special inserts as shown, or as required by other trades.

2.2 FABRICATION

- A. Fabricate and assemble structural steel items in shop. Carefully and accurately shear, flame cut, and chip materials as required. Cut, drill, or punch holes at right angles to surface of metal. Do not enlarge holes by burning. Cut holes cleanly without torn or ragged edges. Weld in accordance with AISC Specifications and with AWS D1.1 and D1.4. Permit only AWS certified welders to perform welds.
- B. Weld deformed bar anchors and headed stud anchors by full-fusion process. Weld in accordance with manufacturer's recommendations regarding equipment, conditions of material, and temperature.
 1. Example processes:
 - a. Nelson Stud Welding Company
 - b. KSM Welding Services Division, Omark Industries.
- C. Hot-dip galvanize steel assemblies and accessories exposed to weather or soil.
- D. Plainly mark and match-mark assemblies and inserts to correspond to placement drawings and diagrams.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Clean assemblies and inserts of corrosion, dirt, oil, grease and laitance before placing in forms.
- B. Place assemblies and inserts in forms and securely anchor in required positions with correct orientations. Use templates, diagrams and instructions provided by Fabricator for proper alignment and positioning.

3.2 FIELD QUALITY CONTROL

- A. Laboratory Testing: provide independent testing laboratory services as follows:
 1. Inspect steel fabrications for sizes, spacings and general quality of fabrication.
 2. Inspect welding of steel fabrications for size, length and quality.
 3. Inspect positioning of assemblies and inserts in forms.
 4. Visually inspect welds at anchors and shear stud connectors. Test studs which do not appear to have full sound 360 degree fillet weld at base. Test by bending 15 degrees. Replace studs which fail this test.
- B. Afford full cooperation and access to Work to testing laboratory and provide adequate notice to laboratory of when Work is ready for testing and inspection so that services can be carried out in full, allowing sufficient time for making corrections without delaying progress of Work.

3.3 ADJUSTING

- A. Field Touch Up
 1. Use cold galvanizing compound in accordance with manufacturer's recommendations for field touch-up.

END OF SECTION

SECTION 03 20 00

CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Preparation of shop drawings
 - 2. Fabrication and placement of reinforcing
- B. Products Furnished, not Installed Under This Section
 - 1. Pier reinforcing

1.2 REFERENCES (Latest Edition)

- A. Codes and Specifications
 - 1. American Concrete Institute (ACI)
 - a. ACI 318, Building Code Requirements for Reinforced Concrete
 - b. SP-066, ACI Detailing Manual
 - 2. Concrete Reinforcing Steel Institute (CRSI)
 - a. Manual of Standard Practice
 - b. RB4.1, Supports for Reinforcement Used in Concrete
 - 3. American Welding Society (AWS)
 - a. AWS D1.1, Structural Welding Code - Steel
 - b. AWS D1.4, Structural Welding Code - Reinforcing Steel
 - 4. American Society for Testing Materials (ASTM)
 - a. ASTM A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
 - b. ASTM A1044, Standard Specification for Steel Stud Assemblies for Shear Reinforcement of Concrete
 - c. ASTM A1064, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
 - d. ASTM A615, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
 - e. ASTM A706, Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
 - f. ASTM A775, Standard Specification for Epoxy-Coated Steel Reinforcing Bars
 - g. ASTM A767, Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement
 - h. ASTM A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
 - i. ASTM D3963, Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars

1.3 SUBMITTALS

- A. Shop Drawings
 - 1. Submit shop and installation drawings for review by Architect, including:
 - a. Reinforcing sizes and quantities
 - b. Reinforcing lengths and bending details
 - c. Placement instructions
 - d. Details and spacing of reinforcing supports
 - e. References to reinforcing designations in Contract Documents
 - f. Notes regarding reinforcing placement
 - g. Material grades
 - 2. Review of Shop Drawings will be for reinforcing sizes, spacing, and general detail only; excluding quantities, lengths and fit of materials.
 - 3. Do not use reproductions of Contract Documents for shop drawings.

- B. Quality Control Submittals
 - 1. Submit certified mill reports, evidencing compliance with Specification requirements.
 - 2. Submit laboratory testing and inspection reports.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in tagged bundles grouped by reinforcing size and length.
- B. Store reinforcing on skids off ground and stacked to permit drainage. Prevent build-up of rust and dirt on reinforcing. Protect reinforcing from contamination that would prevent bonding of concrete.
- C. Do not bend, twist or warp reinforcing during handling.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Reinforcing Steel
 - 1. Deformed bars: new billet steel conforming to ASTM A615 of Grade 60.
 - 2. Smooth bars: conform to ASTM A615 Grade 60.
 - 3. Welded wire reinforcement: conform to ASTM A1064.
 - 4. Reinforcing bars to be welded: conform to ASTM A706.

2.2 ACCESSORIES

- A. Concrete bricks or chairs with bearing plates: Provide where supports are in contact with soil or vapor barrier.
- B. Plastic-tipped chairs in conformance with CRSI RB4.1. Provide of suitable color where concrete soffits will be exposed to view.

2.3 BAR COATINGS

- A. Epoxy Coating: conform to ASTM A775, ASTM D3963.
- B. Hot-dip galvanizing: conform to ASTM A767.

2.4 FABRICATION

- A. Shop Fabrication
 - 1. Cut reinforcing to required lengths
 - 2. Bend reinforcing cold with suitable equipment. Do not heat or stretch material. Provide bend radii and extensions in conformance with ACI 318.
 - 3. Do not use reinforcing with kinks or unrequired bends.
 - 4. Do not re-straighten reinforcing bent more than 30 degrees.
- B. Tolerances: conform to ACI 318.
- C. Marking: mark reinforcing to correspond with shop drawings.
- D. Provide uncoated bars unless noted otherwise.

2.5 SOURCE QUALITY CONTROL

- A. Testing Laboratory Services
 - 1. Inspect fabricating and bending procedures
 - 2. Inspect fabricated materials

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean reinforcing of ice, dirt, loose rust, mill scale, oil, and grease.
- B. Repair of damaged epoxy coating: conform to ASTM D3963
- C. Repair of damaged galvanizing: conform to ASTM A780
 - 1. Example product: Galviline by ZRC Worldwide

3.2 PLACEMENT

- A. Place reinforcing of required sizes and quantities in proper position within forms. Use supports and spacers to maintain position before and during concrete placement.
 - 1. Do not place reinforcing supports against exposed faces of precast panels, beams, walls or copings.
 - 2. Support concrete reinforcing in conformance with CRSI RB4.1
- B. Secure reinforcing in position with wire ties complying with ACI 318.
 - 1. Clip or bend tails of tie wire away from exposed faces, do not leave tie wire within 1 1/2" of any exposed surface.
- C. Concrete Cover: comply with ACI 318 and Contract Documents.
- D. Tolerances
 - 1. Concrete cover to unformed surfaces
 - a. Members 8 inches deep or less: plus 1/4 inch
 - b. Members more than 8 inches deep: plus 1/2 inch
 - 2. Concrete cover to formed surfaces: plus 1/4 inch
 - 3. Longitudinal location of bends and ends of reinforcement: plus 2 inches
 - 4. Spacing between reinforcing bars: 1/4 inch
- E. Support reinforcing in slabs-on-grade and slabs-on-deck on bolsters or blocks. Do not lift reinforcing during concrete placement.

3.3 COLD BENDING OF BARS IN FIELD

- A. Dowels connecting concrete of different pour sequences may be bent in field to facilitate form placement and removal with the following conditions:
 - 1. Maximum bar size is #5
 - 2. Maximum bend angle is 90 degrees
 - 3. Bars may be bent and straightened one time only

3.4 FIELD QUALITY CONTROL

- A. Testing Laboratory Services
 - 1. Inspect reinforcing sizes, quantities and placement.
 - 2. Inspect support and securement of reinforcing.
 - 3. Inspect condition of reinforcing.

END OF SECTION

SECTION 03 31 00

STRUCTURAL CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Design of concrete mixes
 - 2. Furnishing and placing cast-in-place concrete
 - 3. Curing and finishing of concrete
 - 4. Waterstops
 - 5. Non-shrink grout
- B. Products Furnished, not Installed, under this Section
 - 1. Concrete for drilled piers

1.2 REFERENCES (Latest Edition)

- A. American Concrete Institute (ACI)
 - 1. ACI 117, Specification for Tolerances for Concrete Construction and Materials
 - 2. ACI 211.1, Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
 - 3. ACI 213, Guide for Structural Lightweight – Aggregate Concrete
 - 4. ACI 214, Guide to Evaluation of Strength Test Results of Concrete
 - 5. ACI 301, Specifications for Structural Concrete
 - 6. ACI 302.1, Guide to Concrete Floor and Slab Construction
 - 7. ACI 304, Guide for Measuring, Mixing, Transporting, and Placing Concrete
 - 8. ACI 305.1, Specification for Hot Weather Concreting
 - 9. ACI 306R, Guide to Cold Weather Concreting
 - 10. ACI 308, Guide to External Curing of Concrete
 - 11. ACI 309, Guide for Consolidation of Concrete
 - 12. ACI 318, Building Code Requirements for Structural Concrete and Commentary
 - 13. MNL-15, Field Reference Manual
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM C31, Standard Method of Making and Curing Concrete Test Specimens in the Field.
 - 2. ASTM C33, Standard Specification for Concrete Aggregates.
 - 3. ASTM C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - 4. ASTM C42, Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
 - 5. ASTM C94, Standard Specification for Ready-Mixed Concrete.
 - 6. ASTM C138, Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
 - 7. ASTM C143, Standard Test Method for Slump of Portland Cement Concrete.
 - 8. ASTM C150, Standard Specification for Portland Cement.
 - 9. ASTM C156, Standard Test Method for Water Retention by Concrete Curing Materials.
 - 10. ASTM C171, Standard Specification for Sheet Materials for Curing Concrete.
 - 11. ASTM C172, Standard Method of Sampling Fresh Concrete.
 - 12. ASTM C173, Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
 - 13. ASTM C231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
 - 14. ASTM C260, Standard Specification for Air- Entraining Admixtures for Concrete.
 - 15. ASTM C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
 - 16. ASTM C330, Standard Specification for Lightweight Aggregates for Structural Concrete.
 - 17. ASTM C494, Standard Specification for Chemical Admixtures for Concrete.
 - 18. ASTM C567, Test for Unit Weight of Structural Lightweight Concrete.
 - 19. ASTM C618, Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 - 20. ASTM C989, Standard Specification for Slag Cement for Use in Concrete and Mortars.
 - 21. ASTM C1017, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

22. ASTM C1064, Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete.
23. ASTM C1107, Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink).
24. ASTM C1315, Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
25. ASTM C1602, Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.
26. ASTM E1155, Standard Test Method for Determining Floor Flatness and Levelness Using the "F Number" System (Inch-Pound) Units.
27. ASTM E1745, Standard Specification for Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.

C. Corps of Engineers (CRD)

1. CRD-C13, Standard Specification for Air- Entraining Admixtures for Concrete.
2. CRD-C572, Specifications for Polyvinyl Chloride Water Stops.

1.3 SUBMITTALS

A. Product Data: submit manufacturer's data indicating product compliance for the following:

1. Admixtures
2. Floor hardener
3. Curing compound
4. Curing and Sealing compound
5. Vapor Retarder
6. Waterstops
7. Non-shrink grout

B. Material Certifications: submit certifications showing compliance for the following:

1. Portland cement
2. Fly ash
3. Slag cement
4. Sieve analyses for structural concrete aggregates:
 - a. Coarse aggregate
 - b. Fine aggregate

C. Structural Concrete Mix Designs for each class of concrete

D. Concrete Delivery Tickets: Submit sample ready-mixed concrete delivery tickets in accordance with ASTM C94 for each class of concrete.

E. Construction Joints: submit drawings indicating proposed construction joint locations.

1.4 QUALITY ASSURANCE

A. Batch Plant Qualifications: Conform to National Ready-Mixed Concrete Association certification requirements.

1.5 DELIVERY, STORAGE AND HANDLING

A. Transporting: Ready-mixed concrete supplier to have sufficient capacity and adequate facilities to provide continuous delivery at rate required for continuous placement throughout sequence of placement.

B. Storage of Materials

1. Store cement in weather tight buildings or bins which prevent intrusion of moisture or contaminants. Store different types of cement in separate facilities.
2. Stockpile aggregates to prevent segregation and contamination with other materials. Thaw frozen aggregates before use.
3. Drain sand to uniform moisture content before use.
4. Store admixtures securely to prevent contamination, evaporation, damage or temperature variation in excess of range recommended by manufacturer.
5. Store waterstops under cover to prevent exposure to sunlight, moisture, soil and other deleterious materials.

- C. Delivery: Truck mixers, agitators and non-agitating units: Conform to ASTM C94

PART 2 - PRODUCTS

2.1 REPRESENTATIVE MANUFACTURERS

- A. Ardex Americas
- B. Dayton Superior
- C. Euclid Chemical Company
- D. Grace
- E. Mapei Corporation
- F. Sika Corporation
- G. SpecChem
- H. W.R. Meadows

2.2 MATERIALS

- A. Cementitious materials
 - 1. Portland cement: Conform to ASTM C150, Type I, II or III Portland Cement.
 - 2. Blended hydraulic cement: Conform to ASTM C595 Type IL
 - 3. Fly Ash: Conform to ASTM C618, carbon content not greater than 3 percent by volume.
 - 4. Slag Cement: Conform to ASTM C989.
- B. Fine aggregate: Conform to ASTM C33, natural bank or river sand, washed and screened, consisting of hard, durable, uncoated particles free of deleterious matter, and graded from coarse to fine to produce a minimum percentage of voids.
- C. Coarse aggregate: Conform to ASTM C33, gravel or crushed stone, suitably processed, washed and screened; consisting of hard, durable particles without adherent coatings.
- D. Coarse aggregate for lightweight concrete: Conform to ASTM C330.
- E. Water: Conform to ASTM C1602.
- F. Admixtures: Conform to ASTM C494, Type A through G, and used strictly in accordance with manufacturer's recommendations.
- G. Air Entraining Admixtures: Conform to ASTM C260 and CRD-C13.
- H. Calcium chloride thiocyanates or admixture containing more than 0.05 percent chloride ions not permitted in concrete mixtures.
- I. Admixtures containing chlorides not permitted in concrete poured on metal floor deck, nor in post-tensioned concrete.

2.3 CURING AND FINISHING PRODUCTS

- A. Liquid Curing Compound
 - 1. Conform to ASTM C309, Types 1 and 1D, Class B
 - 2. Meet federal and state VOC/AIM regulations.
 - 3. Dissipating resin type, which chemically breaks down after approximately 8 weeks.
 - 4. Does not inhibit bonding of flooring adhesives.

5. Does not inhibit bond breaker, where applicable.
 6. Sodium silicates prohibited.
 7. Use on interior slabs receiving subsequent floor coverings and parking structures.
- B. Curing and Sealing Compounds:
1. Conform to ASTM C1315, Type 1, Class A.
 2. Minimum 25 percent solids by volume.
 3. Moisture loss not more than 0.30 Kg/M2 when applied at 300 square feet per gallon.
 4. Meet federal and state VOC/AIM regulations
 5. Do not use in tilt-up construction
- C. Evaporation Retardant:
1. Thin, continuous film which prevents rapid moisture loss from concrete surface.
 2. Use in concrete operations performed in direct sun, wind, or high temperatures.
- D. Waterproof Paper:
1. Waterproof paper for curing concrete: 2 ply fiber-reinforced, asphaltic kraft paper conforming to ASTM C171.
- E. Floor Hardener:
1. Penetrating liquid for subsequent application
 2. Non-staining
 3. Combination curing compound and hardener not permitted.
- F. Cement Floor Leveling Compound: Free flowing, self-leveling, pumpable, cementitious compound specially formulated for feather-edge application.
- G. Liquid Densifier / Sealer:
1. Siliconate based sealer that penetrates concrete surfaces, increases abrasion resistance, and provides a "low sheen" surface.
 2. Clear, non-yellowing, fast curing, chemically neutral, without oils, fillers, extenders and stabilizers.
 3. Does not inhibit bonding of flooring adhesives.
 4. Does not inhibit bond breaker, where applicable.
- H. Comply with applicable air-quality and environmental regulations.

2.4 MISCELLANEOUS PRODUCTS

- A. Non-Shrink Grout:
1. Pre-mixed, non-shrinking, high strength grout
 2. Compressive strength in 28 days: 5000 psi minimum at 28 days, but not less than specified strength of base concrete.
 3. Conform to ASTM C1107.
 4. Non-oxidizing if permanently exposed to view
 5. Exhibits positive expansion when testing in accordance with ASTM C1090.
 6. Example products:
 - a. Euco N-S Grout, manufactured by Euclid Chemical Co.
 - b. Planigrout 712, manufactured by Mapei Corporation
 - c. SikaGrout 212, manufactured by Sika Corporation.

2.5 CONCRETE MIXES

- A. General: Compose concrete of cementitious materials, fine aggregate, coarse aggregate, water, and admixtures where applicable. Design concrete mixes to be workable and appropriate for each application, to bond readily to reinforcement, without segregation or formation of excessive free water on surfaces.
- B. Strength Gain: design concrete mixes to obtain required strength in 28 days or less from date of placement.
- C. Selection of Proportions
1. Determine ingredient proportions in accordance with ACI 301 to provide required strength, slump, resistance to weathering, placeability, durability and surface hardness for each class of concrete.

2. Provide admixtures as required or appropriate to enhance workability, control set or improve strength.
3. Minimum Cement Content: Cement content not less than 320 pounds per cubic yard
4. Supplementary cementitious materials (fly ash and slag cement)
 - a. Percentage of supplementary cementitious materials not to exceed 25 percent of total cementitious content by weight
 - b. Fly ash not permitted in architecturally exposed concrete
 - c. Supplementary cementitious materials not permitted in concrete receiving dry shake floor hardeners

D. Required Average Strength for Mix Design:

1. Where suitable strength test records for concrete production facility are available, design strength may be based on standard deviation in accordance with ACI 301.
2. Where strength test records are not available, base design strength on the following:

Specified Strength F'c - psi	Required Average Strength F'cr - psi
-----	-----
F'c < 3000	F'c + 1000
3000 ≤ F'c ≤ 5000	F'c + 1200
F'c > 5000	1.10 F'c + 700

E. Documentation of Average Strength: provide evidence of average strength for each class of concrete in accordance with ACI 301 by field strength tests, strength test records or trial mixtures.

F. Concrete Mix Designs: submit mix designs for each class of concrete.

1. Indicate the following for each mix design:
 - a. Class designation
 - b. Proportions of cement, supplementary cementitious materials, fine and coarse aggregates, and water
 - c. Water-cement ratio, design strength, slump, and air content
 - d. Type of cement, supplementary cementitious materials and aggregates
 - e. Type and dosage of admixtures
2. Adjust mix designs as required by weather and jobsite conditions to maintain specified strengths throughout course of Work without additional cost to Owner.
3. As strength data becomes available during progress of Work, mix designs may be adjusted in accordance with ACI 301.
4. Provide mix with target slump not to exceed 8 inches with no visible signs of segregation.

2.6 PRODUCTION OF CONCRETE

A. Do not mix concrete for placement until:

1. Mix designs and corresponding strength tests reflect that each proposed mix will develop strengths required
2. Mix designs have been reviewed for compliance.

B. Batching and Mixing:

1. Batch and mix ready-mixed concrete in accordance with ASTM C94.
2. Batch site-mixed concrete with scales accurate to within 0.4 percent of their total capacities. Consistently measure ingredients within 1 percent for concrete and water, 2 percent for aggregates and 3 percent for admixtures during operation of batching equipment. Mix site-batched concrete in accordance ACI 301.

C. Admixtures: Charge air-entraining admixtures and other chemical admixtures into mixer as solutions and accurately measure by means of a mechanical dispenser. Consider solution as part of mixing water.

2.7 SOURCE QUALITY CONTROL

A. Laboratory Inspection

1. Verify required plant certifications
2. Inspect batching equipment periodically
3. Inspect batching and loading of transit-mix trucks at start of each production day.

- B. Materials Testing
 - 1. Sieve analysis of aggregates

PART 3 - EXECUTION

3.1 PREPARATION

- A. Do not begin delivery of concrete materials until formwork, reinforcement, and embedded items are complete, properly positioned and secured in place.
 - 1. Remove snow, ice, debris and excessive water from forms.
 - 2. Pre-wet soil and sand subgrades and surfaces of precast concrete to receive fresh concrete.
 - 3. Position and secure expansion joint materials, anchors, waterstops, screeds, control joint forms, and expansion caps on slip-dowels.
 - 4. Remove hardened concrete and foreign materials from inner surfaces of conveying equipment, formwork and reinforcing.
- B. Prepare and have ready in good working condition chutes, tremies, pumps, buggies, vibrators and other equipment necessary for orderly and continuous concrete placement.
- C. Where carton-form void forms are used, inspect condition before placing concrete. Replace crushed or weakened boxes and tape joints. Repair sides of grade beam and wall excavations so that not more than 3 inches of ground is visible beyond void box edges.

3.2 INSTALLATION

- A. Conveying:
 - 1. Prevent separation, segregation and loss of ingredients.
 - 2. Convey concrete from mixer to place of final deposit as rapidly as possible.
 - 3. Take special precautions with belt conveyors to prevent segregation of ingredients, drying and rise in temperature during conveying.
 - 4. Use pumps or pneumatic equipment with adequate pumping capacity. Do not exceed 2 inches of slump loss due to pumping. Do not convey concrete through pipes made of aluminum or aluminum alloy.
 - 5. Thoroughly clean conveying equipment at end of each placement sequence.
- B. Depositing:
 - 1. Place concrete continuously in horizontal layers not more than 12 inches deep. Exercise care to avoid seams or weakened planes within concrete. Deposit concrete into, not away from, previously deposited concrete.
 - 2. Do not place fresh concrete against concrete that would result in cold joints.
 - 3. Do not place concrete which has partially set or that contains foreign material.
 - 4. Avoid splashing forms and reinforcing with concrete.
 - 5. Place concrete in forms as near as practicable to final position. Do not transport concrete in forms with vibrators or screeds.
 - 6. Do not drop concrete directly into standing water. Use a tremie with outlet near bottom of place of deposit.
 - 7. Use tremies, chutes or hoppers to place concrete where a vertical drop greater than 5 feet is required.
 - 8. Do not place concrete when slump tests indicate plasticity greater than required limits.
 - 9. Continuously monitor condition of void box forms during placement of concrete. Avoid piling concrete on void forms. Replace void boxes that partially or wholly collapse under weight of concrete.
 - 10. Indiscriminate addition of water to increase slump is prohibited. When concrete arrives at jobsite with slump below that suitable for placing, water may be added only if neither maximum permissible water-cement ratio nor maximum slump is exceeded.
- C. Consolidating:
 - 1. Conform to ACI 309
 - 2. As soon as concrete is deposited, thoroughly agitate by means of mechanical vibrators and suitable hand tools, to work mixture well into parts and corners of forms, and entirely around reinforcement and inserts.
 - 3. Use mechanical vibrators with minimum frequency of 7000 revolutions per minute.
 - 4. Do not over-vibrate concrete or use vibrators to transport concrete within forms. Insert vibrators vertically at frequent intervals, do not drag vibrators through concrete.

- b. Slabs on ground:
 - 1) Average of samples: minus 3/8 inch
 - 2) Individual sample: minus 3/4 inch
- E. Slab Flatness and Levelness:
 - 1. Definitions:
 - a. Floor Flatness (F_F) – Variation between points separated by 2 feet as calculated by ASTM E1155
 - b. Floor Levelness (F_L) – Variation between points spaced 10 feet apart as calculated by ASTM E1155
 - c. Specified Overall Value (SOV) – Composite value of all F-Numbers for test sections of a test surface calculated in accordance with ASTM E1155.
 - d. Minimum Local Value (MLV) – Minimum F-Number value permitted for an individual test section, calculated in accordance with ASTM E1155.
 - e. Test Surface - Entire extents of one continuous concrete slab placement.
 - f. Test Section – A subdivision of the test surface where measurements are taken to collect data for the test surface.
 - 2. Slab flatness and levelness measurements:
 - a. Measure where requested by Owner, at Owner's expense.
 - b. Measure within 72 hours of slab finishing for slabs on ground.
 - c. Testing personnel shall complete manufacturer's training for equipment being used to take flatness and levelness measurements.
 - d. Subdivide Test Surface into Test Sections in accordance with ASTM E1155. Take measurements of Test Sections in accordance with ASTM E1155.
 - e. Required minimum flatness and levelness values:
 - 1) Typical slab
 - a) Slab-on-Grade
 - I) Specified Overall Value – $F_F 25 / F_L 20$
 - II) Minimum Local Value – $F_F 15 / F_L 12$
 - b) Unshored Suspended Slabs
 - I) Specified Overall Value – $F_F 25$
 - II) Minimum Local Value – $F_F 15$
 - 2) Slabs with thin-set tile
 - a) Slab-on-Grade
 - I) Specified Overall Value – $F_F 35 / F_L 25$
 - II) Minimum Local Value – $F_F 21 / F_L 15$
 - b) Unshored Suspended Slabs
 - I) Specified Overall Value – $F_F 35$
 - II) Minimum Local Value – $F_F 21$
 - 3) Mechanical rooms
 - a) Slab-on-Grade
 - I) Specified Overall Value – $F_F 20 / F_L 15$
 - II) Minimum Local Value – $F_F 12 / F_L 9$
 - b) Unshored Suspended Slabs
 - I) Specified Overall Value – $F_F 20$
 - II) Minimum Local Value – $F_F 12$
 - 3. Reporting: Include the following in slab flatness and levelness reports:
 - a. Reporting requirements of ASTM E1155
 - b. Floor plan showing boundary limits of each test surface and each test section with sample measurement lines numbered and locations identified on plan. Indicate locations of deficient test sections on floor plan drawing.
 - c. A plot of slab surface profile elevation as a function of horizontal distance for each sample measurement line.
 - d. Listing of the maximum (+ or -) q value (profile curvature value) for each sample measurement line, along with location ID.

3.4 FINISHING EXPOSED CONCRETE SURFACES

- A. General
 - 1. Conform to ACI 302.1.
 - 2. Double screed slabs at required elevations.

3. Provide camber as required.
4. Apply finishing products and cure in accordance with manufacturers' recommendations.

B. Slab Surfaces

1. Scratch Finish

- a. Locations
 - 1) Surfaces receiving topping slabs
 - 2) Final finish where topping slabs, waterproofing membrane or roofing is placed over finished surface.
- b. Method: Place, consolidate, strike off, and level concrete. Cut high spots and fill low spots. Roughen surface with stiff brushes or rakes before concrete becomes too stiff to brush or rake.

2. Float finish

- a. Locations -Walks, steps, and surfaces receiving waterproofing, roofing, insulation, or sand-bed terrazzo.
- b. Method – Place, consolidate, strike off, and level concrete. Cut high spots and fill low spots. Do not perform further finishing operations until concrete is ready for floating. Floating with hand float, bladed power float equipped with float shoes, or powered disk float. Begin floating when bleed water sheen has disappeared and surface has stiffened sufficiently to permit operation of selected float apparatus. Unless otherwise specified, produce finish that will meet tolerance requirements of ACI 117 for conventional surfaces.

3. Trowel Finish

- a. Locations – Interior floors.
- b. Method: Float then trowel concrete surface. Unless otherwise specified, conform to tolerances for a flat surface in accordance with ACI 117. Addition of water to surface to facilitate finishing is prohibited. Do not apply hard-troweled finish to concrete with total air content greater than 3 percent.

4. Broom or belt finish:

- a. Locations: For exterior surfaces including slabs, ramps, walkways, and steps.
- b. Method: After concrete has received float finish, give concrete surface a coarse-scored texture by drawing a broom or burlap belt across surface.
- c. Provide mockup of concrete finish for Architect and Owner approval.

C. Saw-Cutting Concrete Slabs-on-Grade

1. Saw joints as soon as possible after finishing, but only after concrete is hard enough. Concrete is hard enough when saw blade does not dislodge aggregate and when edges of sawcut do not ravel.
2. Provide joints a minimum of 1/4 inch wide and 1/4 of slab thickness deep unless noted otherwise.
3. Formed strips may be used in lieu of saw-cutting in same locations and to equal depth as sawn joints.

D. Formed Surfaces

1. General: Solidly fill holes resulting from removal of bolts or tie rods with cement grout. Fill holes passing entirely through concrete members from inside face with a plunger-type grease gun or other device to force grout through to outside face.
2. Rough Form Finish
 - a. Locations: For surfaces not exposed to view.
 - b. Remove fins exceeding 1/4 inch in height, and grind bulges that interfere with other trades.
 - c. Fill holes and honeycombs.
3. Smooth Form Finish
 - a. Locations: For surfaces exposed to view.
 - b. Remove fins, bulges and unsightly form marks.
 - c. Fill holes and honeycombs to match surrounding concrete surfaces.
 - d. Provide rubbed finish where satisfactory form finish cannot be achieved.
4. Rubbed Finish
 - a. Locations: For surfaces exposed to view.
 - b. Apply finish as soon as possible after casting concrete, no later than one day following form removal.
 - c. Wet surface and rub with carborundum brick or other abrasive to produce uniform color and texture.
 - d. Patch and dress form tie holes and honeycombs to match color and texture of surrounding concrete.

3.5 CURING AND PROTECTION

- A. Beginning immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures and mechanical damage. Conform to ACI 308.
- B. Protect surfaces not in contact with forms from moisture loss with one of the following methods immediately after finishing and continuing for a period of at least 7 days:
 - 1. Ponding or continuous sprinkling
 - 2. Application of absorptive mats or fabric kept continuously wet
 - 3. Application of sand kept continuously wet
 - 4. Continuous application of steam or mist
 - 5. Application of waterproof sheet materials
 - 6. Application of curing compound in conformance with ASTM C309. Apply curing compounds in accordance with manufacturer's recommendations.
 - a. Do not use curing compound on any surface against which additional concrete is to be placed or other material is to be bonded, unless it is proven that compound will not inhibit bonding, or positive measures are taken to completely remove compound from areas to received bonded materials.
- C. Protect surfaces cast against forms from moisture loss by keeping forms wet until removed. After form removal, protect exposed surfaces from moisture loss by one of the methods specified for surfaces not in contact with forms
- D. Continue curing for a period of 7 days for Type I cement, 3 days for Type III cement, or until tests indicate that concrete has attained 70 percent of required strength.

3.6 FIELD QUALITY CONTROL

- A. Laboratory Testing and Inspection
 - 1. Concrete Compression Testing: Secure composite samples in accordance with ASTM C172. Take samples for strength tests of each mix design placed each day at the following intervals:
 - a. not less than once daily,
 - b. nor less than once for each 150 cubic yards of concrete,
 - c. nor less than once for each 5,000 square feet of surface area for slabs or walls.
 - 2. Mold and cure specimens from each sample in accordance with ASTM C31. Test concrete specimens in accordance with ASTM C39. A single strength test consists of one of the following:
 - a. For designated test age of 28 days:
 - 1) Four 6 inch by 12 inch cylinders: one cylinder tested at 7 days, two cylinders tested at 28 days, one cylinder held in reserve.
 - 2) Five 4 inch by 8 inch cylinders: one cylinder tested at 7 days, three cylinders tested at 28 days, one cylinder held in reserve.
 - b. Arrange additional samples as needed for construction sequencing.
 - 3. Determine slump for each strength test and whenever consistency of concrete appears to vary, in accordance with ASTM C143. Ready mix trucks with Verifi Slump Management System, or approved equal, are permitted.
 - 4. Determine total air content of concrete sample for each strength test.
 - a. Conform to ASTM C231 for normal weight concrete
 - b. Conform to ASTM C138 or C173 for lightweight concrete.
 - 5. Determine concrete temperature by ASTM C1064 for each strength test.
 - 6. Inspection and Monitoring:
 - a. Water additions during transit permitted in accordance with ASTM C94, with trucks equipped with automated slump and water management systems, such as Verifi Slump Management System.
 - b. Monitor addition of water to concrete at job site and length of time concrete is allowed to remain in truck during pour.
 - c. Certify each delivery ticket indicating class of concrete delivered or poured, amount of water added, time at which cement and aggregate were discharged into truck, and time at which concrete was discharged from truck.
- B. Contractor's Responsibilities
 - 1. Furnish necessary labor to assist testing agency in obtaining and handling samples at job-site.
 - 2. Advise testing agency 24 hours in advance of operations to allow for assignment of testing personnel and testing.
 - 3. Provide and maintain for use of testing agency adequate facilities for proper curing of concrete test specimens on project site in accordance with ASTM C31.
 - 4. Burden of proof of structural adequacy where strength tests fail to meet criteria

C. Evaluation and Acceptance:

1. Strength test is defined as the average of one of the following, made from the same concrete sample tested at 28 days or as determined by Architect:
 - a. Two 6 inch by 12 inch cylinders
 - b. Three 4 inch by 8 inch cylinders
2. Strength level of a given class of concrete will be considered satisfactory if each of the following requirements are met for that class of concrete:
 - a. Average of any three consecutive strength test results equals or exceeds specified strength.
 - b. No strength test result falls below specified strength by more than 500 psi when specified strength is 5,000 psi or less, or by more than 10 percent of specified strength when specified strength is greater than 5,000 psi.
3. Concrete strength tests made and tested by testing laboratory are sole criteria of concrete strength unless in-situ tests are made in accordance with Building Code by a qualified independent testing laboratory. Concrete for which strength tests do not meet criteria for acceptance is considered inadequate until proven otherwise.
4. Where strength tests fail to meet criteria specified herein:
 - a. Architect is sole judge of structural adequacy of concrete
 - b. Additional strength evaluations of hardened concrete:
 - 1) Architect may request core testing in conformance with ACI 301 at no additional cost to Owner
 - 2) Nondestructive testing is not acceptable for determining in-place strength.
 - c. If Architect determines, based on strength evaluation testing, that structure is of inadequate strength: repair or remove and replace portions of structure in question, as directed by Architect, at no additional expense to Owner.
 - d. If strength tests fall below specified strength, but not so low as to cause concern for structural adequacy, Architect may request improved conditions of curing or modification of design mixes to improve strength.

3.7 CLEANING AND REPAIR

- A. Upon completion of work, perform the following cleaning and repair procedure:
 1. Remove forms, equipment, protective coverings and resulting rubbish from premises.
 2. Sweep with ordinary broom and remove mortar, concrete droppings, loose dirt, and mud.
 3. Wash concrete floors and platforms with soapsuds and scrub with steel fiber brush.
 4. Mop up suds and flush surfaces with clean water.
 - a. Provide adequate measures during scrubbing, mopping, and flushing operations to keep excessive or injurious amounts of water off floors.
 5. Promptly, effectively and satisfactorily repair any damage occasioned to such floors by or on account of such operations.
 6. Leave finished concrete surfaces in clean condition.
- B. Remove concrete not required by Contract Documents caused by overpour, bulging or collapse of forms or error in form construction.

END OF SECTION

SECTION 03 35 46

CONCRETE TOPICAL TREATMENTS

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. Work Included:
 - 1. Application of cure and seal to new concrete floor slabs.
- B. Related Work:
 - 1. Section 03 30 00 - Cast-In-Place Concrete

1.2 SUBMITTALS:

- A. Product Data: Manufacturer's complete product information and application instructions.
- B. Certificate: Manufacturer's written certification that proposed products comply with applicable Volatile Organic Compound (VOC) regulations.

1.3 QUALITY ASSURANCE:

- A. Comply with Texas Natural Resources Conservation Commission *Regulation V* regarding VOC content of Architectural coatings. Architectural coatings are protective or decorative coatings applied to interior or exterior of buildings or structures, including latex paint, alkyd paints, stains, lacquers, varnishes, and urethanes.
- B. Apply only when air temperature is between 40°F and 90°F. Allow materials to reach ambient temperature prior to application.
- C. Do not apply to concrete surfaces scheduled to receive adhered floor coverings such as resilient flooring and carpet.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. Deliver materials in factory packaging with tags and labels intact and legible.
- B. Store in a dry, ventilated area protected from freezing.
- C. Carefully handle to prevent spills. Close container after each use.

PART 2 - MATERIALS

2.1 PRODUCT/MANUFACTURER:

- A. Cure and Seal Basis of Design: Provide VOCOMP-25 cure and seal for concrete surfaces that produces a clear, high gloss, non-yellowing, slip-resistant penetrating finish as manufactured by W. R. Meadows.
 - 1. Acceptable Manufacturers:
 - Super Diamond Clear VOX; Euclid Chemical
 - L&M Dress & Seal WB25; L&M Construction Chemicals/Laticrete International
 - Vocomp 25; W.R. Meadows
 - 2. Substitutions for Equivalent Products: Refer to SECTION 01 62 00 - PRODUCT OPTIONS for substitution request procedures.
 - 3. Water-based acrylic curing and sealing compound shall be a non-yellowing, clear, acrylic curing and sealing compound meeting the following requirements:
 - a. ASTM C 309, Type 1, Class B
 - b. AASHTO M 148, Type 1, Class B
 - c. ASTM C 1315, Class A, Section 6.4.1 – non-yellowing
 - d. ASTM C 1315, Section 6.6 – exceed 50 MPa (70 psi) adhesion requirements.

PART 3 - EXECUTION

3.1 PREPARATION:

- A. Prepare concrete surfaces to be sealed according to manufacturer's recommendations.
 - 1. Remove all existing curing compounds, oil, grease, laitance, and other incompatible materials.
 - 2. Apply cure and seal only to properly cleaned, etched, and thoroughly dried concrete surfaces.
- B. Protect adjacent surfaces from overspray, including joint surfaces prior to installation of joint sealant.

3.2 APPLICATION:

- A. At new concrete, apply after surface water glaze is gone.
- B. Spray first coat uniformly at the rate of 300 sf/gal. Let first coat dry 6 to 8 hours before applying second coat. Apply second coat uniformly at the same rate in the opposite direction. Squeegee or wipe up all puddling.
- C. Apply only to areas where sealed concrete floor finish is scheduled.
- D. Apply two uniform coats at 300 sf per gallon each without puddling, according to manufacturer's written instructions.

3.3 CLEANING AND PROTECTION:

- A. Clean up and legally dispose of all debris, containers, and other materials from flooring work. Remove from Owner's property.
- B. Protect surfaces from traffic for at least 8 hours after final coat application.

END OF SECTION

SECTION 03 62 14

GROUTING STEEL BASE PLATES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Grout for steel baseplates

1.2 REFERENCE STANDARDS (Latest Edition)

- A. American Society for Testing and Materials:
 - 1. ASTM C1090, Standard Test Method for Measuring Changes in Height of Cylindrical Specimens from Hydraulic Cement Grout
 - 2. ASTM C1107, Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrinkable)

1.3 SUBMITTALS

- A. Product Data: submit manufacturer's data indicating product compliance for the following:
 - 1. Non-shrink grout.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store grout materials in dry condition above ground.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Non-Shrink Grout:
 - 1. Pre-mixed non-shrinking, high strength grout.
 - 2. Compressive strength in 28 days: 8000 psi minimum, but not less than specified strength of base concrete.
 - 3. Comply with ASTM C1107.
 - 4. Nonoxidizing, if grout will be permanently exposed to view.
 - 5. Exhibits positive expansion when testing in accordance with ASTM C1090.
 - 6. Acceptable products:
 - a. Euco N-S Grout, manufactured by Euclid Chemical Co.
 - b. Planigrout 712, manufactured by Mapei Corporation
 - c. SikaGrout 212, manufactured by Sika Corporation.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Surface preparation:
 - 1. Clean slab or foundation of dirt and loose material down to sound concrete.
 - 2. Remove oil, grease, and paint from areas of base plates or foundations to be grouted.
 - 3. Roughen adjacent concrete surfaces where possible.
 - 4. Thoroughly wet concrete contact area at least 4 hours prior to grout placement, or as instructed by grout manufacturer. Keep wet, and remove excess water prior to placement.
- B. Mixing:
 - 1. Use mechanical mortar mixer.
 - 2. Use the minimum amount of mixing water needed for placement.
 - 3. Comply with manufacturer's recommendations for:
 - a. Quantity of water used in mix.
 - b. Length of mixing time.

- c. Pot life.
 - d. Retempering.
- C. Forms:
 - 1. Use side forms if grout space is thicker than 1-1/2 inches.
 - 2. When forms are required, use strong, securely anchored forms, sealed to prevent grout leakage.
 - 3. Remove forms only after grout is completely self-supporting.

3.2 APPLICATION

- A. Placement and Consolidation:
 - 1. Bearing plates shall be fully grouted, without cavities, pockets, or air bubbles.
 - 2. Place grout continuously, and from one side to avoid entrapment of air pockets and to ensure good consolidation.
 - 3. Remove voids by rodding and vibrating during placement.
 - 4. Do not overwork grout.
 - 5. Use grout holes for baseplates larger than 24 inches in width.
- B. Curing:
 - 1. Comply with manufacturer's recommendations for curing.
 - 2. Do not vibrate or disturb grout during curing period.

END OF SECTION

SECTION 04 20 00

MASONRY UNITS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Unit masonry construction.
- B. Related Requirements:
 - 1. Section 01 45 23 - Testing and Inspection Services.
 - 2. Section 03 11 00 - Concrete Forming and Accessories: dovetail anchor slots.
 - 3. Section 04 72 00 - Cast Stone Masonry.
 - 4. Section 05 50 00 - Metal Fabrications: steel lintels.
 - 5. Section 06 16 56 - Air- and Water-Resistive Sheathing Board System
 - 6. Section 07 65 00 - Flexible Flashing: through-wall flashing for masonry walls.
 - 7. Section 07 19 00 - Water Repellents.
 - 8. Section 07 27 26 - Fluid-Applied Membrane Air Barriers.
 - 9. Section 07 92 00 - Joint Sealants.
 - 10. Section 08 11 00 - Hollow Metal Doors and Frames: installation of steel frames.
 - 11. Section 10 99 00 - Miscellaneous Specialties; Recessed Knox Box.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data: Submit for each type of product indicated.
 - 1. Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards.
- C. Samples: Within 60 days after the contract has been awarded, submit manufacturer's standard sample panel showing full range of color, approximately 12" x 24" for each color and size of brick required.
- D. Test Reports: Manufacturer of the concrete masonry units shall submit:
 - 1. Certified test reports showing that the units to be furnished meet the requirements of ASTM C 90 and C 129, and have the required minimum compressive strengths.
 - 2. Reports certifying concrete masonry units meet or exceed each of the fire-resistive ratings.
- E. Provide a diagram of proposed control joints and expansion joints.
- F. Submit steel reinforcing shop drawings for load-bearing concrete masonry unit walls, including elevations showing reinforcing, control joints, bond beams, dimensions and details.
- G. Mortar Mixture Proportions: ASTM C 270, Submit copies of each proposed mix design for review prior to starting masonry work.
- H. Grout Mixture Proportions: ASTM C 476, Submit copies of each proposed mix design for review prior to grout placement.
 - 1. Include recent historical grout cylinder strength test reports for each mix design.
- I. Pre-blended Mortar and Grout Certificates: Submit manufacturer's certificates that products meet or exceed specified requirements.
 - 1. Mortar: Submit test reports, per ASTM C 780, for each mortar mix indicating strength of mortar mixes. Submit computer batch-ticket to confirm the mixes meet the project SPEC MIX specifications for every bag of mortar.
 - 2. Grout: Submit test reports, per ASTM C1019, for each grout mix indicating compressive strengths. Submit computer batch-ticket to confirm the grout mixes meet the project SPEC MIX specifications for every bag of grout.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Manufacturer shall have a minimum of five years' experience manufacturing the specified product.
- B. Installer: Masonry contractor shall have a minimum of five years' experience in similar types of work and be able to furnish a list of previous jobs and references if requested by the Architect.
- C. Pre-installation Conference: Contractor shall schedule pre-installation conference at the project site with Architect/Engineer and Owner's Testing Lab. Conference shall be held prior to proceeding with masonry work and shall comply with requirements in Division 01 Section "Project Management and Coordination".
- D. Expansion Joints (Control Joints): Provide expansion joints as shown on the Drawings or if not shown, install at frequency and in accordance with details as recommended by the N.C.M.A. or B.I.A. Confirm locations and frequency with Architect before beginning work. Refer to expansion joint Paragraph in the Installation portion of this specification section.
- E. Mock-up: Construct a sample wall panel at the site using brick veneer, mortar, and masonry backup proposed for the project. The panel shall duplicate the typical building wall construction (coursing, bonding, joint treatment, sealant, cleaning methods and materials as required in SECTION 07 92 00 - JOINT SEALANTS). Sample panel shall be fully acceptable to the Architect prior to ordering of materials. Install one vertical 3/8" control joint for full height of panel. Panel[s] shall be not less than 4 ft. by 3 ft. Construct panel on a wood pallet, providing portability around the project site. Do not alter nor destroy mock-up until attainment of Substantial Completion. Approved mock-up panel shall be the standard of comparison for workmanship and materials.
- F. Fire-resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Brick Delivery: Do not lay face brick until at least 50% of the brick for the project has been delivered. As brick work progresses, make additional deliveries of brick so that at all times at least 50% of the remaining brick requirements are on the project site. Serve masons brick intermixed from the various storage piles to assure blending of brick.
- B. Store face brick and masonry units above ground on wood pallets which allow air circulation under the stacked units.

1.5 PROJECT CONDITIONS

- A. Refer to "Protection" Paragraph for daily activities.
- B. Cold Weather Construction: Do no masonry work when freezing weather is expected. If Contractor elects to lay masonry when air temperature falls or is expected to fall below 40°F., provide construction means and protection of completed masonry as described in BIA Technical Note 1 - Cold and Hot Weather Construction -- Construction and Protection Recommendations.
 - 1. The use of admixtures or antifreezes to lower the freezing point of mortar shall not be permitted.
- C. In hot weather (above 99°F. with less than 50% relative humidity) protect masonry construction from direct exposure to sun and wind.
- D. Temporary Bracing: Take adequate precautions to prevent damage to walls during erection by high winds or other forces. Where necessary, provide temporary bracing until the designed lateral strength is reached.

PART 2 - PRODUCTS

2.1 MASONRY MATERIALS

- A. Brick Veneer: ASTM C 216 face brick or ASTM C 652 hollow brick.

1. Face Brick: ASTM C 216, Grade SW, Type FBS, face brick.
 2. Hollow Brick: ASTM C 652, Grade SW, Class H40V, Type HBS, hollow brick with 3/4" minimum shell thickness on outer face shell, inner face shell, and end webs.
 3. (BR-01) Brick Veneer: Modular size face brick or hollow brick with actual dimensions of 3-5/8"D x 2-1/4"H x 7-5/8"L. Provide brick scheduled on "Material Finish Schedule" as manufactured by Acme. Manufacturer's identification on brick will not be acceptable.
 4. Substitutions: Requests for substitutions will be considered in accordance with provisions of SECTION 01 62 00 - PRODUCT OPTIONS.
- B. Special Brick Shapes: Provide special shapes and sizes of face brick and glazed brick as required for a complete project. Exposed surfaces to match the face brick in color, texture, and blend. Special shapes and sizes shall include, but not be limited to, the following:
1. Solid bricks at soldier bond corners
 2. Two-faced brick at corners, windows, and doors.
 3. Others as shown on drawings.
- C. Common Brick: ASTM C 62, Grade MW, hard-burned stiff mud or dry-pressed brick. Use common brick where concealed brick is required.
- D. Concrete Masonry Units: ASTM C 90, lightweight, for load-bearing units; ASTM C 129, lightweight, for non-load-bearing units. Provide hollow units made from Portland cement and lightweight mineral aggregate.
1. All units shall be from the same manufacturing plant and shall have the same surface texture.
 2. Use load-bearing units for exterior wall backup and load-bearing partitions, non-load-bearing units elsewhere.
 3. Provide 1" bullnose units at exposed outside corners and jambs and as noted on drawings.
 - a. Provide square edge starter course corners at all rubber base conditions where preformed base corners are specified to be provided.
 - b. Provide square edges at all furred units and units to be covered with ceramic tile.
 4. Provide sash block concrete joints at concrete block walls with pre-molded rubber control joint filler.
 5. Provide 8" starter course where required.
 6. Nominal Size: 8" x 16" face.
 7. Minimum compressive strength as shown on the structural drawings.
 8. Provide "equivalent concrete masonry thickness" required for fire-rated assemblies where required.
 9. Color shall be selected from the field shades and accent colors.
- E. Related Materials:
1. Bond Breaker: ASTM D 226, Type I (No. 15), non-perforated asphalt-saturated felt.

2.2 REINFORCING AND TIES

- A. Wall Ties: ASTM A153
1. For Brick Veneer at CFS: Provide adjustable veneer anchors consisting of 14 gage, ASTM A580, hot-dip galvanized steel screw-on backplates and holes at top and bottom with legs in length as required to accommodate insulation thickness as shown on drawings and specified in SECTION 07 21 00 - BUILDING INSULATION. Also provide polymer-coated screws and hot-dip galvanized steel ties/pintles of 3/16" diameter, with pintle length as required. Product/manufacturer; one of the following:
213 with 282; Heckman Building Products, Inc.
HB-213 with 2X Hook; Hohmann & Barnard, Inc.
2401 (RJ-711) with 242 Hook; Wire-Bond (Masonry Reinforcing Corp. of America)
 2. For Brick Veneer at CMU: Provide adjustable veneer anchors consisting of 14 gage, ASTM A580, hot-dip galvanized steel screw-on backplates and holes at top and bottom with legs in length as required to accommodate insulation thickness as shown on drawings and specified in SECTION 07 21 00 - BUILDING INSULATION. Also provide minimum 3/8" diameter by 1-3/4" long brass expansion bolt provided by anchor manufacturer, consisting of Type 304 stainless steel internal bolt, Type 18-8 stainless steel washer, and brass 260 alloy expansion sleeve and expander cone. Steel ties/pintles shall be hot-dip galvanized of 3/16" diameter, with pintle length as required. Product/manufacturer; provide the following or approved equivalent:
HB-5213 with 2X Hook; Hohmann & Barnard, Inc.
- B. Column Anchors: ASTM A 123 hot dip galvanized steel plates and bars, 1-1/4" wide x 1/4" thick x length to suit condition, for tying masonry walls to steel columns.

- C. Dovetail Slots and Anchors: ASTM 153, 16 gauge hot dip galvanized with corrugated steel ties 1" wide x length required to suit condition.
- D. Wall Ties for CMU Veneer at CMU Backup: Provide adjustable veneer anchors consisting of 14 gage, ASTM A580, hot-dip galvanized steel screw-on backplates and holes at top and bottom with legs in length as required to accommodate insulation thickness as shown on drawings and specified in SECTION 07 21 00 - BUILDING INSULATION. Also provide minimum 3/8" diameter by 1-3/4" long brass expansion bolt provided by anchor manufacturer, consisting of Type 304 stainless steel internal bolt, Type 18-8 stainless steel washer, and brass 260 alloy expansion sleeve and expander cone. Steel ties/pintles shall be hot-dip galvanized of 3/16" diameter, with pintle length as required. Product/manufacturer; provide the following or approved equivalent:
HB-5213 with 2X Hook; Hohmann & Barnard, Inc.
- E. Joint Reinforcement at Single-wythe Concrete Masonry Unit and Concrete Masonry Unit Veneer: Provide ladder type with continuous 9 gage ladder side and cross rods spaced not more than 16" o.c. and welded, unless smaller spacing is shown on the drawings. Product/manufacturer; one of the following:
#220 Ladder-Mesh; Hohmann & Barnard, Inc.
Series 200 Ladder Mesh; Wire-Bond
 1. Finish shall be Class 1 mill galvanized.
 2. Corners and tees shall be prefabricated.
- F. Joint Reinforcement at Multi-wythe Concrete Masonry Unit: Provide ladder type with continuous 9 gage side and cross rods spaced not more than 16" o.c. and welded, unless smaller spacing is shown on the drawings. Product/manufacturer; one of the following:
#270-2X Ladder Eye-Wire; Hohmann & Barnard, Inc.
Series 800 Ladder; Wire-Bond
 1. Finish shall be hot-dip galvanized.
 2. Corners and tees shall be prefabricated.
- G. Reinforcing Steel: ASTM A 615, Grade 60, deformed billet steel.

2.3 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, domestic manufacture.
 1. Provide white Portland cement for colored mortar and mortar used in laying glazed structural facing tile and glazed brick.
 2. Provide natural Portland cement for other masonry.
- B. Lime: ASTM C 207, Type S, with not more than 8% unhydrated oxides.
- C. Aggregate for Mortar; Sand: ASTM C 144, well-graded natural sand. Provide white or light color sand for colored mortar and white mortar.
- D. Aggregate for Grout: ASTM C 404.
- E. Coloring Pigment: Standard mortar color(s) as selected by Architect. Provide coloring pigment as manufactured by Lambert Southwest, Inc., (phone 903.657.4680 web site: www.lambertsw.com) or Solomon Colors (phone 800.624.0261 web site www.solomoncolors.com).
- F. Water: Clean and free of deleterious amounts of acids, alkalis, or organic materials.
- G. Water-repellent Admixture: Provide same integral liquid polymeric water repellent admixture used in split-faced and burnished concrete masonry units for mortar used in laying split-faced and burnished concrete masonry units.

2.4 MORTAR; FIELD PREPARED

- A. Mix proportions: ASTM C 270, mortar proportions by volume:
 1. Type N Mortar - Exterior and Interior at masonry veneer construction:
 - 1 part Portland cement
 - 1 part lime
 - 6 parts sand

Coloring Pigment: Add coloring pigment at manufacturer's recommended rate to obtain custom blended colors as selected by Architect. No mortar color is required at concealed or painted masonry.

2. Type M Mortar - Exterior masonry veneer construction below grade or in contact with earth:
 - 1 part Portland cement
 - 1/4 part lime
 - 3-3/4 parts sand
 3. Type S Mortar - Exterior and Interior at load-bearing and non-load-bearing concrete masonry unit walls:
 - 1 part Portland cement
 - 1/2 part lime
 - 4-1/2 parts sand
- Coloring Pigment: Add coloring pigment at manufacturer's recommended rate to obtain custom blended colors as selected by Architect. No mortar color is required at concealed or painted masonry.
4. Bedding Mortar:
 - 1 part Portland cement
 - 1/7 part lime
 - 3 parts sand

2.5 MORTAR; FIELD PREPARED

A. Mix proportions:

1. Type N Mortar - Exterior and Interior at masonry veneer construction. ASTM C 270, mortar proportions by volume. Proportions are to be in compliance with the range stated within ASTM C270, as observed by the Owner's Testing Laboratory.
 - a. Coloring Pigment: Add coloring pigment at manufacturer's recommended rate to obtain custom colors as selected by Architect. No mortar color is required at concealed or painted masonry.
2. Type M Mortar - Exterior masonry veneer construction below grade or in contact with earth. ASTM C 270, mortar proportions by volume. Proportions are to be in compliance with the range stated within ASTM C270, as observed by the Owner's Testing Laboratory.
3. Type S Mortar - Exterior and Interior at load-bearing and non-load-bearing masonry unit walls. ASTM C 270, mortar proportions by volume. If proportions are not in compliance with the range stated within ASTM C270, as observed by the Owner's Testing Laboratory, testing of mortar for mortar aggregate ratio shall be performed per ASTM C 780, Annex A4.
 - a. Coloring Pigment: Add coloring pigment at manufacturer's recommended rate to obtain custom colors as selected by Architect. No mortar color is required at concealed or painted masonry.
4. Bedding Mortar:
 - 1 part Portland cement
 - 1/7 part lime
 - 3 parts sand

B. Mixing:

1. All dry material shall be accurately measured in a leak-proof batching box. Contractor shall have the option of using a pre-manufactured cubic foot batching box or fabricating a wood box for measuring dry materials by volume. Box may be a convenient size, but shall be not less than 12" x 12" x 12" inside dimensions. The use of shovels for measuring dry materials is strictly prohibited.
2. Proportion mortar accurately and mix thoroughly with the maximum amount of water to produce a workable consistency for at least 5 minutes in a mechanical batch mixer. Keep tools and mixing equipment clean.
3. Do not use mortar which has begun to set, or if more than 2½ hours have elapsed since initial mixing. Do not re-temper mortar.
4. Mortar for Split-face, Smooth-face, and Burnished Concrete Masonry Units: Add water repellent admixture at manufacturer's recommended rates to ensure mortar will be permanently water repellent.

C. Use: Lay exterior and interior masonry veneer construction using Type N mortar. Lay exterior masonry veneer below grade or in contact with earth using Type M mortar. Lay exterior and interior load-bearing and non-load-bearing masonry using Type S mortar. Where required use bedding mortar to set and fill hollow metal frames.

D. Masonry cement is not acceptable for mortar.

E. Do not use calcium chloride in mortar.

F. Pre-mix, dry or wet, is not acceptable for mortar, except as listed below; i.e. no other pre-mix mortars are acceptable.

2.6 MORTAR; PRE-BLENDED MORTAR MIXES, COLORED MORTAR MIXES, AND INTEGRAL WATER REPELLENT MORTAR MIXES

- A. Basis of Design: Provide pre-blended mortar mix, colored mortar mix, and integral water repellent mortar mix as manufactured by SPEC MIX, Inc. (phone 888.773.2649 web site: www.specmix.com) or Quikrete Cement and Concrete Products—Dallas (800.627.6125) instead of field-prepared mortars. SPEC MIX or Quikrete pre-blended mortar option shall include manufacturer's standard silo system for mixing and delivery of mortar mixes.
 - 1. Equivalent products will be reviewed and considered per SECTION 01 62 00 - PRODUCT OPTIONS.
 - 2. Pre-blended mortar mixes shall be mixed with potable water in strict compliance with manufacturer's written instructions and recommendations.
 - 3. Masonry cement is not acceptable for pre-blended mortar.
- B. SPEC MIX PCL Sand Pre-blended Mortar Mix:
 - 1. Material: Pre-blended factory mix of Portland cement, hydrated lime and sand aggregate mixtures.
 - 2. Mortar Type: Property mixture Type S for exterior and Interior at load-bearing and non-load-bearing masonry unit walls and Type N for exterior and Interior masonry veneer construction.
- C. SPEC MIX PCL Sand Pre-blended Colored Mortar Mix:
 - 1. Material: Pre-blended factory mix of Portland cement, hydrated lime, sand aggregate, and color pigments.
 - 2. Mortar Type: Property mixture Type S for exterior and Interior at load-bearing and non-load-bearing masonry unit walls and Type N for exterior and Interior masonry veneer construction.
- D. SPEC MIX PCL Sand Pre-blended IWR Colored Mortar Mix:
 - 1. Material: Pre-blended factory mix of Portland cement, hydrated lime, sand aggregate, color pigments, and incorporating dry SPEC MIX Integral Water-repellent Mortar Admixture.
 - 2. Mortar Type: Property mixture Type S for exterior and Interior at load-bearing and non-load-bearing masonry unit walls and Type N for exterior and Interior masonry veneer construction.
- E. Mixing: Mix mortar using manufacturer's standard mechanical mixer to ensure homogeneity and workability. Observe mixing times of 4-5 minutes, consistent from batch to batch. Use clean, potable water; add the maximum amount consistent with optimum workability.
 - 1. At the end of the day, thoroughly rinse the mixer to avoid contamination of future mortar batches.
 - 2. Discard mortar 2.5 hours after initial mixing.

2.7 GROUT; FIELD PREPARED

- A. Grout shall conform to ASTM C 476. Provide grout for bond beams, masonry lintels, and reinforced masonry.
 - 1. Fine Grout Proportions:
 - 1 part Portland cement
 - 1/10 part lime
 - 3 parts fine aggregate
 - 2. Coarse Grout Proportions
 - 1 part Portland cement
 - 1/10 part lime
 - 3 parts fine aggregate
 - 2 parts coarse aggregate
- B. When placing grout in masonry, exercise extreme care to prevent grout from staining face of masonry.

2.8 GROUT; PRE-BLENDED

- A. Contractor's Option: Provide pre-blended grout mix as manufactured by SPEC MIX, Inc. (phone 888.773.2649 web site: www.specmix.com), instead of field-prepared grouts. SPEC MIX pre-blended grout option shall include manufacturer's standard silo system for mixing and delivery of grout mixes.
 - 1. Equivalent products by Quikrete Cement and Concrete Products—Dallas (800.627.6125) will be considered acceptable.
 - 2. Pre-blended grout mixes shall be mixed with potable water in strict compliance with manufacturer's written instructions and recommendations.
- B. SPEC MIX Core Fill Masonry Grout:

1. Material: Pre-blended factory mix of cementitious materials and dried aggregates meeting ASTM C 476 requirements for reinforced masonry construction.
 2. SPEC MIX Core Fill - Fine Grout: Pre-blended mix containing cementitious materials and fine aggregate designed to fill masonry voids two inches or less.
 3. SPEC MIX Core Fill - Course Grout: Pre-blended mix containing cementitious materials and coarse aggregate designed to fill masonry voids greater than two inches.
- C. Mixing: Mix grout using manufacturer's standard mechanical mixer to ensure homogeneity and workability. Observe mixing time of 5 minutes, consistent from batch to batch. Use clean, potable water; add the maximum amount consistent with optimum workability.
1. Discard unused grout 1.5 hours after initial mixing.

2.9 BRICK CLEANERS AND SEALERS

- A. Use "Sure-Klean Vana Trol" as manufactured by ProSoCo, Inc., or an approved equivalent inorganic commercial masonry surface cleaner. "Sure Klean 600" may be used at concrete masonry units which are not adjacent to colored mortar and concrete masonry units which are scheduled to be painted.

2.10 ACCESSORIES

- A. Control Joints: Preformed rubber material; RS Series Rubber Control Joint as manufactured by Hohmann & Barnard, Inc. or comparable products by Heckman. Width slightly less than wall thickness to allow for sealant material.
- B. Round Plastic Weep/Vent Tubing: Medium-density polyethylene, 3/8-inch OD by 4 inches long.
- C. Cellular Plastic Weeps:
1. One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8" less than depth of outer wythe.
 2. Color shall be selected by Architect from full range of color samples.
 3. Product/manufacturer; one of the following:
Mortar Maze weep vent; Advanced Building Products Inc.
No. 85 Cell Vent; Heckmann Building Products Inc.
Quadro-Vent; Hohmann & Barnard, Inc.
Cell Vent; Wire-Bond
- D. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the cavity. Provide strips, full-depth of cavity, 10 inches high, with dovetail shaped notches 7 inches deep that prevent mesh from being clogged with mortar droppings. Product/manufacturer; Mortar Net™ with Insect Barrier, Mortar Net USA, Ltd. (phone 800.664.6638 web site: www.mortarnet.com).
1. 0.4" thick Mortar Net between back of brick and steel lintels, cut down to required height.
 2. Provide single thickness 2" material at 1-3/4" to 2-1/4" wide masonry cavities.
- E. Cavity Drainage Material: Free-draining nonabsorbent polymer mesh, made from 100% recycled plastic products. Product/manufacturer; CavClear Masonry Mat (phone 888.436.2620 web site: www.cavclear.com).
- F. Provide "BlockFlash" as manufactured by Mortar Net USA, Ltd. CMU cell flashing pans with built-in adjoining bridge made from recycled polypropylene with chemical stabilizers that prevent UV degradation. Flashing pans have a sloped design to direct moisture to the integrated weep spout. Designed to be built into mortar bed joints to expel moisture (unimpeded by mortar droppings) to the exterior of CMU walls.
- G. Rebar Positioners: Size and type required to accurately place reinforcing steel in bond beams, concrete masonry unit lintels, and vertically in walls.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Wetting of Face Brick:
1. Draw a 1" circle with wax crayon on the bed surface of dry brick. Using medicine dropper, place 20 drops of water inside circle and measure time required for absorption of water.
 2. If water is absorbed in less than 1-1/2 minutes, brick must be wet before being laid.

3. Brick shall have no visible moisture when laid.
- B. Cleaning: Beams, slabs, and lintels on which masonry walls and partitions are to be laid shall be brushed thoroughly to remove loose dirt and laitance.

3.2 INSTALLATION

A. Installation Tolerances:

1. Maximum Variation from Plumb:

a. Vertical lines and surfaces of columns and walls:

- 1) 1/4" in 10'-0".
- 2) 3/8" in any story or 20'-0" maximum.
- 3) 1/2" in 40'-0".

b. External Corners or Control Joints:

- 1) 1/4" in any one story or 20'-0" maximum.
- 2) 1/2" in 40'-0".

2. Maximum Variation from Unit to Adjacent Unit: 1/32" maximum. Maximum variation is mandatory on walls where only one surface is exposed. Where two surfaces are exposed to view, the more prominent face, per Architect, is to have maximum variation maintained, with the less prominent face allowed to exceed the maximum tolerance.

3. Maximum Variation from Level or Grades for Exposed Lintels, Sill, Parapets, or Horizontal Grooves:

- a. 1/4" in any bay or 20'-0" maximum.
- b. 1/2" in 40'-0".

4. Maximum Variation from Plan Location or Linear Building Line or Related Portions of Columns, Walls, and Partitions:

- a. 1/2" in any bay or 20'-0" maximum.
- b. 3/4" in 40'-0".

5. Maximum Variation in Cross-sectional Dimension of Columns and Thickness of Walls: $\pm 1/4$.

6. Maximum Variation in Mortar Joint Thickness:

- a. Bed Joint: $\pm 1/8$ ".
- b. Head Joint: $\pm 1/8$ ".

- B. Dimensions are based on **modular** units except for special details. If units other than **modular** units are used, there shall be no change in story heights or other main dimensions of partition centerlines, and connecting work shall be adjusted to changes in unit sizes.

- C. Laying Brick: Lay brick level, plumb, straight, and true to line within tolerances specified above. Spread the mortar bed full width and relatively smooth. Do not furrow. Butter the end of each brick with mortar and shove into place to completely fill the head joint. Do not feather the brick with excess mortar cut from the bed.

1. At concrete foundations and beams, install bond breaker between first course of brick veneer and concrete bearing. Gaskets at bottom of cavity walls shall not be used as bond breakers unless gasket occurs under the first course of brick.
2. Cut masonry units with motor-driven saw designed to cut masonry with clean, sharp, unchipped edges. Cut units to provide patterns shown and to fit adjoining work neatly. Use full units without cutting wherever possible. Remove cut misfits and replace with properly cut units.
3. Lay brick with special coursing and jointing as detailed. Lay rowlock and soldier courses with uniform joints approximately 3/8" wide. Use uncured brick for the exposed ends of such courses and wherever the holes would be exposed.
4. When laying walls, keep the air space free and clear of mortar droppings and debris.
5. Unless shown otherwise, provide vertical control joints every 40'.
6. Refer to Expansion Joint Paragraph for Expansion Joints (Control Joints).

- D. Laying Concrete Masonry Units: Spread mortar beds smooth and full to cover bearing areas. Do not furrow. Butter head joints and shove units into place. Head joints shall be staggered except where stack bond is specifically indicated. Make back joints full against the backing materials as each course is laid.

1. Leave pipe spaces open on one full side until pipe work has been completed and inspected.
2. Lay concrete masonry walls and partitions level, plumb, straight, and true to line within tolerances specified above.
3. Fill the cells of exposed concrete masonry units with grout for a width of 8" at the jambs of openings in exterior and interior walls.
4. Exposed ends of units at external corners shall be solid.
5. Units shown to be laid in stack bond shall be laid with such accuracy that a plumb line centered on a vertical joint in an upper course will be entirely within the width of the corresponding vertical joint in every lower course.

6. Unless shown otherwise, provide vertical control joints every 40'.
 7. At sound absorbing concrete masonry units, provide slip-set stabilizer at 16" o.c., vertically,
 8. Maximum pour of grout in vertical cells shall be limited to 5'-0" unless cleanouts are provided at each cell.
- E. Installation of Reinforced Unit Masonry:
1. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.
 - a. Construct formwork to conform to shape, line, and dimensions shown. make sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.
 - b. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.
 2. Set reinforcing in required position and secure against displacement before grouting is started. Cells requiring vertical reinforcement and grout shall be aligned to provide continuous unobstructed vertical opening. Place vertical reinforcing in cells with enough steel extending to provide proper lap splice. Horizontal steel shall be fully embedded in grout.
 3. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
 - a. do not exceed the following pour heights for fine grout.
 - 1) For minimum widths of the grout spaces of 3/4 inch or for minimum grout space of hollow unit cells of 1-1/2 by 2 inches, pour height of 12 inches.
 - 2) For minimum widths of grout spaces of 2 inches or for minimum grout space of hollow unit cells of 2 by 3 inches, pour height of 60 inches.
 - 3) For minimum widths of grout spaces of 2-1/2 inches or for minimum grout space of hollow unit cells of 2-1/2 by 3 inches, pour height of 12 feet.
 - 4) For minimum widths of grout spaces of 3 inches or for minimum grout space of hollow unit cells of 2 by 3 inches, pour height of 24 feet.
 - b. Do not exceed the following pour heights for coarse grout.
 - 1) For minimum widths of the grout spaces of 1-1/2 inches or for minimum grout space of hollow unit cells of 1-1/2 by 3 inches, pour height of 12 inches.
 - 2) For minimum widths of grout spaces of 2 inches or for minimum grout space of hollow unit cells of 2-1/2 by 3 inches, pour height of 60 inches.
 - 3) For minimum widths of grout spaces of 2-1/2 inches or for minimum grout space of hollow unit cells of 3 by 3 inches, pour height of 12 feet.
 - 4) For minimum widths of grout spaces of 3 inches or for minimum grout space of hollow unit cells of 3 by 4 inches, pour height of 24 feet.
 4. Provide cleanout holes at least 3 inches in least dimension for grout pours over 60 inches in height. Cleanouts shall be sealed after inspections before grouting.
 - a. Provide cleanout holes at each vertical reinforcing bar.
 5. Place grout in lifts not exceeding 5 feet.
 6. Consolidate grout at the time of initial placement.
 7. Grouting of a section of wall shall be completed within one day with no interruptions greater than one hour.
- F. Reinforcing Masonry Joints: Reinforce the bed joints of concrete masonry unit walls and partitions with continuous joint reinforcement strips.
1. Furnish strips in long lengths. Width of strips shall be 2" less than nominal overall width of the wall or partition.
 2. Lap strip ends 12" and bed side rods in mortar for complete cover and bond.
 3. Install strips in bed joints spaced 16" o.c., unless a smaller spacing is shown in the drawings. Reinforcement shall extend into and bond the facing wythe in walls. Reinforcement shall not occur in the same joint course as the masonry veneer anchors.
 4. Install strips in bed joints of concrete masonry unit veneer spaced 16" o.c. vertically.
 5. At concrete masonry unit veneer, discontinue horizontal joint reinforcement across control joints and reinforcement shall not occur in the same joint course as the masonry veneer anchors.
 6. At exterior masonry walls, discontinue horizontal joint reinforcement across control joints.
 7. At interior masonry walls and intersection of interior/exterior masonry walls, continue horizontal joint reinforcement across control joints.
- G. Reinforcing Masonry Joints at Masonry Veneer Not Laid in Running Bond: Reinforce the bed joints of masonry veneer with continuous wire reinforcement.
1. Install entire length of longitudinal wire in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
 2. Connect seismic clip to every masonry veneer wall tie/pintel and to the continuous wire reinforcement.

3. Space reinforcement not more than 18 inches o.c. vertically.
 4. Extend reinforcement a minimum of 8" into adjacent running bond masonry veneer.
 5. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.
 6. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.
- H. Bonding: Tie together masonry unit construction within walls and at intersections of walls by masonry bond and staggered vertical joints. Toothing will not be permitted except where specifically authorized by the Architect. Where walls must be built in advance of adjacent walls, form the stop-off by racking back.
1. Lay brick facing wythe in standard running bond with staggered head joints except where special coursing is indicated. Tie multiple wythe construction together with horizontal joint reinforcement and tab ties.
 2. Where bond with joint reinforcement cannot be made, use wall ties spaced not more than 16" o.c. horizontally and vertically. Ties shall be laid in the joints, not shoved into wet mortar after setting the next course of masonry.
 3. Tie brick veneer back to steel stud curtain walls and concrete unit masonry with metal ties spaced 16" o.c. horizontally and 16" o.c. vertically. Around the perimeter of openings, edges, and tops and bottoms of walls, additional ties/anchors shall be installed at a maximum of 3 ft. o.c. within 12" of the opening. Secure ties through the sheathing to the studs with two screws and insert ties.
 - a. Secure wall tie backplates with fasteners that are wet-set with sealant compatible with the air- and water-resistive barrier system.
 4. Tie masonry to structural steel columns by welding anchors to columns at 16" o.c. and inserting triangular ties. Ties shall be of the size required to extend a minimum of 1-1/2" into brick veneer, with a minimum mortar cover of 5/8" to the outside face of the veneer.
 5. Where concrete is faced more than 12" high with masonry, bond masonry to concrete with anchors set into dovetail anchor slots cast into the concrete. Provide the anchors. Spacing shall be as specified above for wall ties.
 6. Bond interior masonry walls and the intersection of interior/exterior masonry walls by forming control joints and reinforce with horizontal reinforcing at 16" o.c.
 7. Partitions between rooms without suspended ceilings, and 4" thick partitions with an unsupported length of more than 12 ft. shall be extended to the floor or roof above and wedged and sealed against it. Extend other partitions above the highest adjacent ceiling, unless indicated to extend up to floor or roof above.
- I. Joints shall be 3/8" wide. Joints shall be straight and uniform.
1. Tool and work exposed joints to a hard, dense surface with a sled runner and leave without shrinkage cracks. Delay tooling until the mortar has set thumbprint hard. Tool the joints in masonry walls behind chalkboards and tackboards.
 2. Rake out the joints to be caulked and keep them free of mortar as the work progresses.
 3. Provide control joints at inside corners with backer rod and sealant.
 4. Mortar color changes: Location of mortar color changes in relation to masonry color changes shall be as directed by Architect. Contractor shall rake and point mortar joints or otherwise alter standard masonry procedures to satisfy this requirement.
- J. Masonry Bearings: Provide bearings of common brick under framing members which bear on masonry walls unless the members bear directly on concrete-filled bond beams.
- K. Chases: Form chases and recesses to the required dimensions and lines, strike joints flush and remove excess mortar. Before closing chases and similar inaccessible spaces with masonry, remove rubbish and sweep out the area.
- L. Lintels and Beams: Provide lintels and beams for openings in masonry walls. This includes lintels at masonry openings for ducts. Verify duct layouts on the mechanical drawings.
1. Reinforced Masonry Lintels: Construct and reinforce masonry lintels where shown.
 - a. Make concrete masonry lintel units of the same material and by the same process as the other concrete masonry units used in the building.
 - b. Use trough-type units, not regular units with the web knocked out. Fill the troughs with grout.
 - c. Build lintels in place where possible and cure at least 14 days before subjecting them to load. Provide at least 8" bearing at each jamb.
 - d. Where reinforcing is not specifically called out for masonry lintels, use not less than a #4 bar top and bottom of 8" high masonry units for each 4" thickness of wall.
 2. Bond Beams: Provide bond beams in masonry walls. Bond beams shall be continuous where possible. Provide rebar positioners to accurately position reinforcing steel.

3. Steel Lintels: Build steel lintels into the masonry walls. Where reinforcing or steel shapes are not specifically called out for lintels in brick walls, use one steel angle for each 4" thickness of brick in the wall.
- M. Flashing:
1. Build in flashings which enter the masonry, using the materials and following the instructions of the pertinent sections of the specifications.
 2. Create end dams at ends of window heads, at edges of storefronts, and other vertical elements to channel water to nearest weep hole away from window mullions and other items which might allow water to travel vertically.
- N. Weeps: Install weep holes in veneer at 24" o.c. horizontally for clay masonry and 32" o.c. for 16" long concrete masonry, above through-wall flashing, above shelf angles, and at top and bottom of walls. Install plastic weeps in strict accordance with manufacturer's written instructions and recommendations.
- O. Cavity Drainage Material: Install cavity drainage material in cavities to comply with manufacturer's written instructions and recommendations. Provide single thickness 2" material at 1-3/4" to 2" wide masonry cavities. Provide one or more thicknesses as required to fill cavity width at other conditions. Install cavity drainage material with fabric facing to the exterior of the wall.
- P. Expansion Joints (Control Joints):
1. At exterior masonry walls, discontinue horizontal joint reinforcement across control joints.
 2. At interior masonry walls and intersection of interior/exterior masonry walls, continue horizontal joint reinforcement across control joints.
 3. At concrete masonry unit veneer, discontinue horizontal joint reinforcement across control.
 4. Provide resilient continuous lengths of control joint material in concrete masonry unit sash blocks. Solvent weld butt and corner joints, in accordance with manufacturer's instructions.
 5. Size control joints in accordance with SECTION 07 92 00 - JOINT SEALANTS, for sealant performance, but in no case larger than adjacent mortar joints in exposed face brick.
 6. Interior control joints are not required to align with exterior control joints.
 7. Provide vertical expansion joints in masonry (concrete masonry unit and brick), as follows:
 - a. Where shown on drawings.
 - b. Horizontal expanse:
 - 1) Brick:
 - a) 25'-0" max. spacing at walls without openings. Spacing includes the sum of the distance around outside corners.
 - b) 20'-0" max. spacing at walls with openings. Spacing includes the sum of the distance around outside corners.
 - c) Within 2'-0" of outside corners.
 - 2) Concrete Masonry Units:
 - a) Not to exceed a length to height ratio of 1-1/2 : 1 or 25 ft., whichever is less.
 - b) Adjacent to corners of walls or intersections within a distance equal to half the control joint spacing.
 - c) At intersections with other CMU walls (joint reinforcing shall be continuous).
 - c. Within 2'-0" of outside corners.
 - d. At all inside corners.
 - e. Change of substrate including but not limited to the following:
 - 1) Concrete masonry unit to metal stud back-up.
 - 2) In masonry wall at intersection of concrete beam supported masonry and structural steel supported masonry.
 - f. As recommended by referenced standards.
 8. Control joints shall extend continuous through bond beam although concrete and reinforcement for bond beam shall extend continuous through control joint.
- Q. Built-in Work:
1. As work progresses, build-in metal door frames, fabricated metal frames, window frames, wood nailing strips, anchor bolts, plates, and other items to be built in the work supplied by other sections.
 2. Build-in items plumb and level.
 3. Bed anchors of metal door and glazed frames in mortar joints. Fill frame voids solid with mortar. Fill masonry cores with mortar minimum 8" from framed openings.
 4. Do not build-in organic materials subject to deterioration.
- R. Cutting and Fitting:
1. Cut and fit for chases, pipes, conduit, sleeves, and grounds. Cooperate with other sections of work to provide correct size, shape, and location.

2. Obtain approval prior to cutting or fitting an area not indicated or where appearance or strength of masonry work may be impaired.
- S. Miscellaneous Work:
1. Cooperate with other trades in installing their work in masonry. Furnish bedding mortar and set loose lintels. Cooperate in setting bucks and frames, maintain them in position and build them in with anchors properly placed. Do not distort frames by crowding.
 2. Cut and form openings for recessed items and for electrical and plumbing installations so that wall plates and escutcheons will completely cover the openings. Cut edges shall be clean, sharp and straight.
 3. Fill solid with mortar the spaces around and behind metal door frames.
 4. Point with mortar the openings around flush-mounted electrical outlet boxes.
- T. Sound-conditioned Masonry Walls: Fill cells of concrete masonry walls scheduled to be sound conditioned with grout.
1. Grouted masonry walls shall be covered with plastic sheeting secured with Hohmann & Barnard, Inc. Masonry Wall Clamp No. HB3000. Grout must be completely dry when wall is finished and enclosed.
 2. At the end of each day's work, cover the tops of grouted masonry walls and other unfinished exposed cavity wall openings with secured plastic sheeting.
- U. Curing: In dry weather, masonry exposed to wind and sun shall be wet with a fine water spray several times each day for at least 6 days, starting as soon as the mortar has set sufficiently to resist erosion.
- V. Building Expansion Joints: Discontinue horizontal joint reinforcement across building expansion joints.
- W. Non-load-bearing Concrete Masonry Unit Partitions: Partitions which extend up to structure above for fire, acoustical, or security reasons, shall terminate within 2" of structural deck, joists or beams to allow for deflection. Fill 2" gap with sealant and fire safing to achieve proper rating.

3.3 PROTECTION

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Maintain protective boards at exposed external corners which may be damaged by construction activities.
- C. Provide protection without damaging completed work.
- D. At the end of each day's work, cover the tops of masonry walls, window sills and jambs, door jambs, and other unfinished exposed cavity wall opening with plastic sheeting or other suitable material. Cover shall extend a minimum of 2' down both sides of walls and shall be held securely in place with Hohmann & Barnard, Inc. Masonry Wall Clamp No. HB3000.
- E. Keep expansion joint voids clear of mortar.

3.4 POINT AND CLEAN

- A. Pointing: Upon completion of the masonry work, fill and neatly point line nail holes and other defects. Remove mortar droppings from projecting surfaces.
- B. Cleaning:
 1. Clean face brick with a commercial cleaner. Test the cleaner on an inconspicuous area of face brick to insure that it performs as intended without leaving scum or residue. Before the solution is applied, soak the brick surface with clean water. Apply the cleaner in accordance with the manufacturer's instructions and rinse the surface thoroughly with clean water to remove traces of the cleaner. Protect metal and concrete surfaces from contact with the cleaner.
 2. Clean exposed concrete masonry units by dry brushing at the end of each day's work and after final pointing to remove mortar spots and droppings.

3.5 FIELD QUALITY CONTROL

- A. General: Owner will employ services of an independent materials testing laboratory to perform specified inspections and testing.
- B. Coordinate with Owner's testing laboratory to provide PERIODIC inspection of the following tasks:
 - 1. As masonry construction begins, and every 5000 sq. ft. during construction, the following shall be verified to ensure compliance:
 - a. Proportions of site prepared mortar.
 - b. Construction of mortar joints.
 - c. Location of reinforcement and connectors.
 - 2. During construction, the inspection program shall verify:
 - a. Size and location of structural elements.
 - b. Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames, or other construction.
 - c. Specified size, grade, and type of reinforcement and anchor bolts.
 - d. Protection of masonry during cold weather (temperature below 40°F.) or hot weather (temperature above 90°F.).
 - 3. Prior to grouting at interior non-load-bearing partitions shown in the Architectural drawings, the following shall be periodically verified to ensure compliance:
 - a. Grout space is clean.
 - b. Placement of reinforcement and connectors.
 - c. Proportions of site-prepared grout.
 - d. Construction of mortar joints.
- C. Coordinate with Owner's testing laboratory to provide CONTINUOUS inspection of the following tasks:
 - 1. Prior to grouting at masonry walls shown on the Structural Drawings, the following shall be continuously verified to ensure compliance:
 - a. Grout space is clean.
 - b. Placement of reinforcement and connectors.
 - c. Proportions of site-prepared grout.
 - d. Construction of mortar joints.
 - e. Grout placement shall be verified to ensure compliance with code and construction document provisions.

END OF SECTION

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SECTION 04 43 00

STONE MASONRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Chopped and honed stone veneer anchored to unit masonry back-up at exterior walls.
 - 2. Metal anchors, mortar, and joint pointing.
- B. Related Sections:
 - 1. Section 04 20 00 - Masonry Units.
 - 2. Section 04 72 00 - Cast Stone Masonry.
 - 3. Section 05 50 00 - Metal Fabrications: Shelf angles and supports.
 - 4. Section 06 10 00 - Rough Carpentry: Wood framed supporting wall.
 - 5. Section 07 62 00 - Sheet Metal Flashing and Trim: Coping and sill flashings.
 - 6. Section 07 92 00 - Joint Sealers: Sealant for perimeter, and control joints.
- C. Work Installed but Furnished under Other Sections:
 - 1. Section 05 50 00 - Metal Fabrications: Metal fabricated items for building into the work.

1.2 SUBMITTALS

- A. General: Submit shop drawings and product data under provisions of Section 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings:
 - 1. Indicate on shop drawings, layout, pertinent dimensions, anchorages, reinforcement, head, jamb, and sill opening details, and control jointing methods.
 - 2. Submit manufacturer's field erection or setting drawings under provisions of Section 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES
 - 3. Submit Chopping and Setting Drawings:
 - a. The chopped stone supplier shall prepare and submit to the Architect, for approval, complete chopping and setting drawings for all the limestone work under this contract. Such drawings shall show in detail the sizes, sections and dimensions of stone, the arrangement of joints and bonding, anchoring and other necessary details. If the contract drawings do not show the intent of the jointing, it will be the stone fabricator's responsibility to establish the jointing in accordance with industry standards. The contractor shall furnish all field dimensions necessary for fabrication. These drawings shall be based upon and follow the drawings and full-size details prepared by the Architect except where it is agreed in writing that changes be made. Each stone indicated on these drawings shall bear the corresponding number marked on an unexposed surface with a non-staining paint.
 - b. Projecting courses shall have beds in the wall at least 1" greater in depth than the projection, or be specially anchored to the structure as shown on setting drawings.
 - c. Provision for the proper anchoring, dowelling, and cramping of work in keeping with standard practices, also for the support of stone by shelf angles and loose steel, etc. when required, shall be clearly indicated on the setting drawings.
- C. Product Data:
 - 1. Provide product data on stone units, mortar products, and reinforcements.
 - 2. Submit manufacturer's installation instructions under provisions of Section 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- D. Samples: Submit three samples 12 x 12 inch in size illustrating minimum, average, and maximum sizes, color range and texture, markings, surface finish.
- E. Mockup: Before installing stone masonry veneer, construct sample wall panels to verify selections made under Sample submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for completed Work.
 - 1. Locate mockups in the locations indicated or, if not indicated, as directed by Architect.

2. Build mockups in sizes approximately 48 inches long by 48 inches high by full thickness, including chopped stone, structural supporting wall, anchors, control joint condition, and include cast stone coping at top of mockup.
3. Notify Architect 7 days in advance of the dates and times when mockups will be constructed.
4. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - a. Approval of mockups does not constitute approval of deviations from Contract Documents contained in mockups, unless such deviations are specifically approved by Architect in writing.
 - b. When directed, demolish and remove mockups from Project site.
5. Provide mockup under provisions of SECTION 01 45 00 - QUALITY CONTROL.

1.3 QUALITY ASSURANCE

- A. Stone Supplier: Company specializing in quarrying chopped stone with minimum of ten years documented experience.
- B. Installer: Company specializing in installing chopped stone with 5 years documented experience.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and protect products to site under provisions of Section 01 65 00 - PRODUCT DELIVERY REQUIREMENTS and Section 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS.
- B. Protect stone from visible discoloration.

1.5 PROJECT CONDITIONS

- A. Maintain materials and surrounding air to a minimum 40 degrees F prior to, during, and 48 hours after completion of work.
- B. During temporary storage on site, at the end of working day, or during rainy weather, cover stonework exposed to weather with non-staining waterproof coverings, securely anchored.
- C. Stain Prevention: Immediately remove grout, mortar, and soil to prevent them from staining the face of stone masonry veneer.
 1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on the ground and over the wall surface.
 2. Protect sills, ledges, and projections from mortar droppings.
 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed stone masonry veneer.
- D. Hot-Weather Requirements: Protect stone masonry-veneer work when temperature and humidity conditions produce excessive evaporation of water from mortar. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F and above.

PART 2 - PRODUCTS

2.1 STONE

- A. Natural Stone Masonry (STN): Provide "Vienna Brick Rock" as provided by Apex Stone/Acme Brick/Stone. Tops, bottoms, and both ends to be rough chop. (6" minus height).
- B. Cap: Provide Boggy Flagstone Cap, 2" thick x widths as shown on drawings. Provide where noted on drawings at exterior.
- C. Grade: free of defects.

2.2 MORTAR

- A. Mortar: ASTM C270 Type N using proportion specifications; with Type I Portland cement.
 - 1. Color: SGS 22H Tan
- B. Water: Clean and potable.

2.3 ACCESSORIES

- A. Anchors, Dowels, Ties, Cramps: Stainless Steel Wire: ASTM A580, Type 304, of size and configurations required for support of stone and applicable superimposed loads.
 - 1. Anchors shall be of sufficient size to extend at least halfway, but not less than 1-1/2 inches, through stone masonry and with at least a 5/8-inch cover on exterior face
- B. Supports: Steel, ASTM A36, galvanized after fabrication to ASTM A123, 1.25 oz/sq ft.
- C. Bolts, Washers, and Nuts: Galvanized steel.
- D. Flashings: Furnished under SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM.
- E. Sealant: Type specified in SECTION 07 92 00 - JOINT SEALANTS, not detrimental to stonework.
- F. Cleaning Solution: Type which will not harm stone, joint materials, or adjacent surfaces. Consult stone supplier for recommended type.

2.4 MORTAR MIX

- A. Thoroughly mix mortar ingredients in quantities needed for immediate use.
- B. Add mortar color in accordance with manufacturer's instructions. Ensure uniformity of mix and coloration.
- C. Do not use anti-freeze compounds in mortar.
- D. Use mortar within two hours after mixing.
- E. If necessary, retemper mortar within two hours of mixing to replace water lost by evaporation.

2.5 STONE FABRICATION

- A. Slope exposed top surfaces of stone and horizontal sill surfaces for natural wash.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine surfaces to receive stone masonry veneer, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of stone masonry veneer.
 - 1. Examine substrate to verify that inserts, reinforcement, veneer ties, flashing, and other items installed in unit masonry and required for or extending into stone masonry veneer are correctly installed.
 - 2. Examine wall framing, exterior sheathing, and asphalt-saturated felt covering to verify that stud locations are suitable for spacing of veneer anchors and that installation will result in a weatherproof covering.
 - 3. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Verify that support work and site conditions are ready to receive work of this Section.
- C. Establish lines, levels, and coursing. Protect from disturbance.
- D. Beginning of installation means acceptance of existing conditions.

3.2 PREPARATION

- A. Verify that items built-in under other Sections are properly located and sized.
- B. Clean stone prior to erection. Do not use wire brushes or implements which will mark or damage exposed surfaces.

3.3 INSTALLATION

- A. Back Checking & Fitting to Structural Frame:
 - 1. Stone coming in contact with structural work shall be back checked as indicated on the general drawings. Stone resting on structural work shall have beds shaped to fit the supports.
 - 2. Where stone facing adjoins columns and spandrel beams the depth of stone shall be such that will allow not less than 1" of clearance between the stone and structural members.
 - B. Erect stone in accordance with stone supplier's instructions and erection drawings.
 - C. Arrange stone pattern as directed by Architect.
 - D. Set stone in full mortar setting bed to support stone over full bearing surface and to establish joint dimensions.
 - E. Set stone to comply with requirements indicated on Drawings. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure stone masonry veneer in place. Set stone accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances.
 - F. Maintain uniform joint widths, except for variations due to stone size variations and minor variations required to maintain bond alignment, if any. Lay walls with joint width of 1/4 to 3/8 inch
 - G. Rake out joints for pointing with mortar to depth of not less than 3/4 inch before setting mortar has hardened. Rake joints to uniform depths with square bottoms and clean sides.
 - H. Pointing:
 - 1. Prepare stone-joint surfaces for pointing with mortar by removing dust and mortar particles. Where setting mortar was removed to depths greater than surrounding areas, apply pointing mortar in layers not more than 3/8 inch deep until a uniform depth is formed.
 - 2. Point stone joints by placing and compacting pointing mortar in layers of not more than 3/8 inch deep. Compact each layer thoroughly and allow to it become thumbprint hard before applying next layer.
 - 3. Tool joints, when pointing mortar is thumbprint hard, with a smooth jointing tool to produce the following joint profile:
 - a. 3/4" Raked Joint Profile: Smooth, flat face recessed.
 - I. Provide expansion, control, and pressure-relieving joints of widths and at locations indicated.
 - 1. Sealing expansion and other joints is specified in SECTION 07 92 00 - JOINTS SEALANTS.
 - 2. Keep expansion joints free of mortar and other rigid materials.
 - J. Shore up units for 7 days after setting.
 - K. Install sealant and backing rod at joints.
 - L. Install flashings of longest practical length and seal watertight to back-up. Lap end joint minimum 6 inches and seal watertight.
- ### 3.4 TOLERANCES
- A. Positioning of Elements: Maximum 1/4 inch from true position.
 - B. Maximum Variation from Plane of Wall: 1/4 inch in 10 feet; 1/2 inch in 50 feet.
 - C. Maximum Variation from Plumb: 1/4 inch per story non- cumulative; 1/2 inch in any two stories.

D. Maximum Variation from Level Coursing: 1/8 inch in 3 feet; 1/4 inch in 10 feet; 1/2 inch maximum.

E. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.

3.5 CUTTING AND FITTING

A. Obtain approval prior to cutting or fitting any item not so indicated on Drawings.

B. Do not impair appearance or strength of stone work by cutting.

3.6 CLEANING

A. Remove excess mortar and sealant upon completion of work.

B. Clean soiled surfaces with cleaning solution.

C. Use non-metallic tools in cleaning operations.

END OF SECTION

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SECTION 04 72 00

CAST STONE MASONRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Labor, materials and equipment to provide the cast stone as indicated on the drawings and specified herein.
 - 2. The manufacturer shall furnish and deliver all cast stone covered by this specification.
 - 3. Contractor shall unload, store and set all cast stone covered by this specification and shall provide and install all anchors for same.
- B. Related Sections:
 - 1. Section 04 20 00 - Masonry Units.
 - 2. Section 07 92 00 - Joint Sealants.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Samples:
 - 1. Initial Selection:
 - a. Submit samples for color selection by Architect.
 - b. Submit samples for colored mortar, showing the full range of colors available.
 - 2. Following color selection by Architect, re-submit 3 samples approximately 8" x 8", finished to show the variation in color and texture which will occur in the material delivered to the project site.
- C. Product data:
 - 1. Provide construction details, material descriptions, dimensions of individual components and profiles, and finishes for cast stone units.
 - 2. Test results of cast stone stone previously made by the manufacturer.
 - 3. Qualification Data: Provide lists of completed projects with project names and addresses, names and address of architects and owners, and other information necessary.
- D. Shop Drawings:
 - 1. Drawings shall show the sizes, profiles, cross-sections, and dimensions of stone, the arrangement of joints, bonding, connections to adjoining walls or materials, anchoring methods, anchors, reinforcing, method of installation and anchoring.
 - 2. Provide suitable wash on all exterior sills, copings, projecting courses and pieces with exposed top surfaces.
 - 3. Window sills, when provided, shall have raised fillets at the back.
 - 4. All projecting pieces and soffit stones shall have drips under the outer edge.
 - 5. The shop drawings shall show the setting mark of each stone and its location on the structure. The stone when delivered shall bear the same corresponding setting mark on an unexposed surface.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. Firm with not less than five years of continuous operation, having successful experience, adequate facilities, and capacity to furnish the quality, sizes, and quantity of cast stone required without delaying the progress of work.
 - 2. Manufacturer shall be responsible for reinforcement and anchorage design.
 - 3. Firm shall be a current producer member of the Cast Stone Institute.
- B. The average water absorption of cast stone shall not exceed 6% by dry weight when tested in accordance with the requirements of ASTM C 642 or ASTM C 1195.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. All cast stone shall be carefully loaded and packed for transportation exercising customary and reasonable precaution against damage while in transit.
- B. All cast stone shall be received and unloaded at the project site by competent workmen with the necessary care and handling to avoid damage and soiling.
- C. Cast stone units delivered to the site shall be inspected for damage, unloaded, and stored with a minimum of handling. Damaged stone will be rejected and shall be removed from the project site.
- D. Protect cast stone during storage and construction against wetting, soiling, staining, and damage.
- E. The cast stone material shall be stored clear of the ground on non-staining planking or pallets in such a manner as to be protected from damage while in storage. Should cast stone be stored for an extended period, cover with polyethylene or other non-staining waterproof material.

1.5 PROJECT CONDITIONS

- A. Environmental Requirements: No stone shall be set when freezing weather is expected.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Provide cast stone units as manufactured by one of the following:
 - Advanced Architectural Stone; Fort Worth, Texas
 - CSCS/Stone Legends; Dallas, Texas
 - Dallas Cast Stone, Inc.; Dallas, Texas

2.2 CAST STONE MATERIALS

- A. Raw Materials:
 - 1. Portland Cement: ASTM C 150, Type I or Type III, white, domestic manufacture.
 - 2. Fine Aggregate: Carefully graded and washed natural sands, or manufactured granite, quartz or limestone sands meeting ASTM C 33 except that gradation may vary to achieve desired finish and texture.
 - 3. Coarse Aggregate: Carefully graded and washed natural gravels, or crushed, graded stone such as granite, quartz, limestone or other durable stone meeting ASTM C 33 except that gradation may vary to achieve desired finish and texture.
 - 4. Color and Finish:
 - a. Color shall be as selected by Architect.
 - b. Coloring Agent: Inorganic (natural or synthetic) iron oxide pigments complying with ASTM C 979, excluding the use of a cement grade of carbon black pigment, and shall be guaranteed by the pigment manufacturer to be non-fading and limeproof. The amount of pigment shall not exceed 10% by weight of the cement used.
 - c. The samples shall be approved by the Architect before the manufacturer shall be permitted to proceed with the work.
 - d. Match sample on file in Architect's office. Color and texture of cast stone shall be generally equal to the approved sample when viewed in direct daylight at a 10-foot distance.
 - e. Exposed surfaces, unless shown otherwise, shall exhibit a fine grained texture similar to natural stone. No bug holes or air voids will be permitted.
 - f. Variation: Must match color and finish of approved sample subjected to similar aging and weathering conditions when viewed in direct daylight at a 10 foot distance.
 - 5. Admixtures - ASTM C 494.
 - 6. Water: Clean, potable and free of deleterious amounts of acids, alkalies, or organic materials.
- B. Physical Properties:
 - 1. Cast stone shall have a minimum compressive strength of 6,500 psi at 28 days when tested in accordance with ASTM C 1194.
 - 2. Multiply requirements of field cut or core drilled specimens by 80% to determine minimum compressive strength requirements.

- C. Curing and Finishing:
 - 1. Cure units in a warm, moist curing chamber at 95% relative humidity for 24 hours, or yard cure for 350 degree-days (i.e. 7 days @ 50°F. or 5 days @ 70°F.) prior to shipment.
 - 2. Acid-etch exposed surfaces to remove cement film prior to packaging for shipment.

2.3 REINFORCING AND ANCHORS

- A. Reinforcing Bars: ASTM A 615, Grade 60. Bars shall be hot-dipped zinc coated after fabrication in accordance with ASTM A 123.
- B. Reinforcing Mesh: ASTM A 185, No. 3 gage zinc-coated wire rods electrically welded on 4" centers each way.
- C. Anchors, inserts, and dowels shall be corrosive resistant, galvanized, brass or stainless steel Type 304.
- D. Cast stone panels shall be reinforced as may be required for handling, and to allow for temperature changes and structural stress.
- E. There shall be a minimum steel reinforcement amounting to ¼ percent of the cross-section area of the panel and should the panel be greater than 12" in any sectional dimension, the temperature steel shall be placed in both directions.
- F. Reinforcement shall be galvanized or epoxy coating when covered with less than 1-1/2" of material.

2.4 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150, white, domestic manufacture.
- B. Lime: ASTM C 207, Type S.
- C. Sand: ASTM C 144, clean, washed, masonry natural sand.
- D. Color: ASTM C979, Non-fading, iron oxide, limeproof pigment to produce mortar custom color as selected by Architect to match cast stone. The Architect shall approve the actual color sample of mortar before proceeding with grouting or pointing.
- E. Water: Clean and free of deleterious amounts of acids, alkalies, or organic materials.

2.5 MORTAR MIXES

- A. Setting Mortar: Proportions by volume:
 - 1 part Portland cement
 - 1 part lime
 - 6 parts white silica sand
- B. Pointing Mortar: Proportions by volume:
 - 1 part Portland cement
 - 1 part lime
 - 6 parts white silica sand
- C. Coloring agent as required to provide consistent custom color.

2.6 FABRICATION

- A. General: Cast stone shall be Type I complying with ASTM C 1364, color as selected by Architect. Cast units shall be free from defects such as cracks, loose aggregate, broken edges, and marred finish surfaces which may affect appearance or serviceability. All units shall be equal in color and surface texture to approved samples.
- B. The manufacturer shall be responsible to design a mix which achieves both the strength and the surface finish desired.

- C. The average water absorption of cast stone shall not exceed 6% by dry weight when tested in accordance with the requirements of this specification.
- D. All casting shall be done in accurate molds designed to withstand high frequency vibration. Steel reinforcement units shall be accurately placed. Vibration shall be continuous during the casting process until full specified thickness is reached and all excess water brought to the surface.
- E. Curing: No cast stone shall be shipped to the project site until after it has been properly cured at the manufacturer's plant as specified.
- F. Fabrication Tolerances: Comply with Cast Stone Institute Technical Manual (current edition).
 - 1. Height and Width: Plus 1/16", minus 1/8"
 - 2. Length:
 - a. Up to 2'-0": Plus 1/16", minus 1/8"
 - b. 2'-0" to 5'-0": Plus 1/8", minus 1/8"
 - c. 5'-0" to 10'-0": Plus 1/8", minus 3/16"
 - 3. Setting tolerances: Plus or minus 1/8" allowable out of plane from adjacent unit.
 - 4. Joints: +1/16", -1/8".

PART 3 - EXECUTION

3.1 JOINTING

- A. Joint Size:
 - 1. At stone/brick joints - 3/8".
 - 2. At stone/stone joints in vertical position - 1/4"
 - 3. Stone/stone joints exposed on top side - 3/8".
- B. Joint Material:
 - 1. Use a full bed of mortar at all bed joints.
 - 2. Sealant: Head joints in copings, and joints at column covers, cornices, platforms, soffits, window sills, and in general, all stone sections with projecting profiles, exposed top joints or rigid suspension connections to the supporting structure should be set with unfilled joints. After setting, prime the ends of stones, insert properly sized foam back-up rod to proper depth, and gun-in sealant.
 - 3. Mortar: Masonry-bound trim such as belt courses, lintels, window surrounds, date stones, inscription blocks, quoins, keystones, similar applications, and vertical joints shall be mortar joints.
 - 4. Rake all mortar joints 3/4" for either pointing mortar or sealant as selected by Architect.
- C. Location of joints:
 - 1. As shown on approved shop drawings.
 - 2. Unless otherwise shown, at control and expansion joints per plan.

3.2 ERECTION

- A. Stone shall be clean. Before setting, sponge or drench with clean water.
- B. Set stone units level, square, and true with uniform mortar joints as specified.
- C. All cast stone shall be set by experienced masons, accurately and in accordance with the shop and setting drawings.
- D. Unless otherwise noted, every stone shall be set in a full bed of mortar.
- E. Reference "Joint Materials" paragraph in the "Jointing" Article above for direction on erection/installation at the different joint areas.
- F. All anchors and dowels shall be firmly placed and all anchor holes and dowel holes and similar holes filled completely with mortar or non-shrink grout.
- G. All anchors, dowels and other anchoring devices shall be furnished by the setting contractor as shown on approved shop drawings using, whenever possible, standard building stone anchors commercially available in a non-corrosive material such as galvanized steel, brass or Type 304 stainless steel.

- H. When setting with mortar, all stones not thoroughly wet shall be drenched with clear water just prior to setting.
- I. After each stone has been set, all joints shall be raked to a depth of 3/4" from the face for pointing. The face of each stone shall then be sponged off to remove any splashed mortar or mortar smears.
- J. Only the ends of lugged sills and similar stones shall be embedded in mortar. The balance of joint to be left open until pointing of stone work, than tuck points on face only to a depth of 3/4". Tuck point stone joints to a slight concave.
- K. All stone shall be protected from splashing mortar or damage by other trades.
- L. Form weep holes at the bottom of every vertical joint. Form weep holes with 1/4" oiled sash cord or plastic tubing and remove when the mortar has set.
- M. Installation tolerances shall be in accordance with requirements of SECTION 04 20 00 - MASONRY UNITS.

3.3 TESTING

- A. Testing shall be performed in accordance with ASTM C 31, ASTM C 39, ASTM C 642, and ASTM C 1194, except that 2" cube specimens shall be used, oven-dried in accordance with ASTM C 97.
- B. Test three specimens per 500 cubic feet at random from plant production in accordance with referenced standards.
- C. The results of compression tests shall be divided by a factor of 0.8 when saw-cut or core-drilled specimens are used.

3.4 PATCHING AND CLEANING

- A. The repair of chipped or damaged cast stone shall be done only by mechanics skilled in this class of work, with materials furnished by the manufacturer and according to this direction.
- B. Before pointing, the face of all cast stone shall be scrubbed with a fibre brush, using soap powder and water and shall then be thoroughly rinsed with clean running water. Any mortar on the face of the cast stone shall be removed. No acids or prepared cleaners shall be used without the approval of the cast stone manufacturer.

3.5 POINTING AND CAULKING

- A. When ready for pointing, the joints shall be dampened and carefully pointed to a slight concave unless otherwise specified by the Architect. No pointing shall be done in freezing weather nor in locations exposed to hot sun, unless properly protected. The Architect shall approve color of pointing mortar before proceeding with pointing.
- B. Head joints in copings and similar stones shall be caulked with a joint sealant used in accordance with the manufacturer's instructions.

3.6 INSPECTION AND ACCEPTANCE

- A. Applicable standards for inspection and quality control shall be ACI Committee 311 Manual of Concrete Inspection and PCI MNL-117 Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products.
- B. Cast stone shall show no obvious repairs or imperfections other than minimal color variations when viewed with the unaided eye at a 20 ft. distance in good typical daylight illumination.

3.7 PROTECTION

- A. Cast stone shall be protected after erection and until final cleaning by non-staining rosin sized paper or polyethylene film of not less than 4-mil thickness.

- B. Cast stone at entrances shall be protected until substantial completion is achieved.

END OF SECTION

SECTION 05 12 00

STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural steel as defined in AISC 303
2. Shear stud connectors
3. Miscellaneous angles and plates
4. Laboratory testing and inspection
5. Shop painting

1.2 REFERENCE STANDARDS (Latest Edition)

A. American Institute of Steel Construction, AISC:

1. AISC Steel Construction Manual
2. AISC 360, Specification for Structural Steel Buildings
3. AISC 303, Code of Standard Practice for Steel Buildings and Bridges.
4. RCSC Specification for Structural Joints Using High-Strength Bolts

B. American Society for Testing and Materials:

1. ASTM A29, Standard Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought
2. ASTM A36, Standard Specification for Carbon Structural Steel
3. ASTM A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
4. ASTM A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
5. ASTM A123, Standard Specification for Zinc (Hot-Dip Galvanizing) Coatings on Iron and Steel Products
6. ASTM A143, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
7. ASTM A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
8. ASTM A193, Standard Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
9. ASTM A307, Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength
10. ASTM F3125, Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength
11. ASTM F436, Standard Specification for Hardened Steel Washers
12. ASTM A449, Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use
13. ASTM A500, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
14. ASTM A501, Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
15. ASTM A572, Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
16. ASTM A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
17. ASTM A786, Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates
18. ASTM A992, Standard Specification for Structural Steel Shapes
19. ASTM A1085, Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS)
20. ASTM F1554, Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
21. ASTM B117, Standard Practice for Operating Salt Spray (Fog) Apparatus
22. ASTM D522, Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings

- C. American Welding Society:
 - 1. AWS D1.1, Structural Welding Code - Steel
 - 2. AWS D1.3, Structural Welding Code - Sheet Steel
 - 3. AWS D1.8, Structural Welding Code – Seismic Supplement
- D. Industrial Fasteners Institute:
 - 1. Book of Fastener Standards
- E. The Society for Protective Coatings, SSPC:
 - 1. SSPC Painting Manual, Volume 1, Good Painting Practice
 - 2. SSPC Painting Manual, Volume 2, Systems and Specifications

1.3 SUBMITTALS

- A. Shop Drawings: Submit detailed shop and installation drawings showing shop and erection details including member sizes, grades of materials, details of fabrication and erection, and end connections.
 - 1. Do not begin fabrication of materials prior to review of shop drawings.
 - 2. Review of shop drawings is for member sizes, spacings, detail, and general compliance with Contract Documents only.
 - 3. Engineering calculations for connections requiring design, signed and sealed by licensed engineer.
 - 4. Clearly note slip critical connection requirements.
 - 5. Reproductions of Contract Documents are not acceptable for use as shop drawings.
 - 6. Material quantities, lengths, fit, verification of job conditions and coordination with other trades are responsibility of Contractor.
- B. Erection Procedure: Submit descriptive data illustrating general procedure for erection of structural steel including sequence of work, proposed schedule and details of temporary staying and bracing.
- C. Submit Mill Certifications showing compliance of materials with ASTM and AISC Specifications.
- D. Submit Mill Certifications (Manufacturer's Inspection Certificates) for bolts, nuts and washers.
- E. Submit manufacturer's data sheets or certified test results indicating compliance with requirements for manufactured components.

1.4 QUALIFICATIONS

- A. Fabricator
 - 1. Not less than 5 years of experience fabricating structural steel for projects of similar size and complexity.
 - 2. Participate in AISC Quality Certification Program and be designated as an AISC Certified Plant, Category BU.
- B. Detailer
 - 1. Not less than 5 years of experience detailing structural steel for projects of similar size and complexity.
- C. Erector
 - 1. Not less than 5 years of experience erecting structural steel for projects of similar size and complexity.
 - 2. Participate in AISC Quality Certification Program and be designated as an AISC Certified Erector, Category CSE.
- D. Welding
 - 1. Qualified in accordance with AWS D1.1.
 - 2. Maintain AWS certification throughout duration of Project.
 - 3. If requested by Architect, submit identifying stenciled test coupons made by operator whose workmanship is subject to question. If reasonable doubt of proficiency exists, re-qualify and certify welder by independent Testing Laboratory at no additional expense to Owner.
 - 4. Work suspected of deficient quality may be subject to removal of coupons from any location on any joint for testing. Remove sections of welds found defective and properly reweld before proceeding with work.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Coordinate delivery of anchor rods and other anchorage assemblies to be embedded in concrete or masonry construction. Provide setting drawings, instructions and templates required for proper placement of anchor rods and embeds.
- B. Sequence shipments of fabricated steel to expedite erection and minimize field handling of material.
- C. Store structural steel above ground on skids or platforms. Protect steel from corrosion. Store packaged materials in unbroken containers.
- D. Ensure coatings of low-hydrogen electrodes are thoroughly dry when used. Use electrodes taken from hermetically sealed packages within 4 hours, or dry in accordance with AWS D1.1 before use. Do not use electrodes of any type that have been wet.
- E. Do not store materials on structure in a way that may overload members or supporting structures.
- F. Do not bend or damage materials during shipment, handling and erection.
- G. Store fasteners in protected place in sealed containers with manufacturer's labels intact.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Structural Shapes
 - 1. Plates and bars: ASTM A572 Grade 50
 - 2. HSS: ASTM A500 Grade C
 - 3. M, S, HP and L: ASTM A572 Grade 50
 - 4. W, WT, C and MC: ASTM A992
- B. Bolts
 - 1. High Strength Bolts: ASTM F3125
 - 2. Washers: ASTM F436
 - 3. Nuts: ASTM A563
 - 4. Manufacturer's symbol and grade markings must appear on bolts and nuts
- C. Anchor Rods
 - 1. Anchor Rods: ASTM F1554
 - 2. Plate Washers: ASTM A572 Grade 50
 - 3. Heavy Hex Nuts: ASTM A563
- D. Welding Electrodes:
 - 1. Conform to AISC and AWS Specifications.
 - 2. Use E70 electrodes unless noted otherwise.
 - 3. Use E80 electrodes for welding of ASTM A706 rebar.
- E. Coatings
 - 1. Shop Primer:
 - a. Comply with SSPC-SP2.
 - b. Compatible with top coatings.
 - 2. Primer for Architecturally Exposed Structural Steel
 - a. Example Products:
 - 1) Tnemec Series V10
 - 2) Carboline Carbocoat
 - 3) Sherwin-Williams Kem Kromik Universal B50 Series
 - 3. Zinc-Coating for Structural Steel: Conform to ASTM A123 and A143.
 - 4. Zinc coating for threaded products: Conform to ASTM A153.
 - a. Do not galvanize grade A490 bolts.
 - 5. Cold Galvanizing: Conform to ASTM A780

- a. Example Product: ZRC Galvilitite

F. Shear Stud Connectors

1. Fusion welded, headed shear stud connectors with ferrules and accessories designed to create composite deck action by mating of shear stud connectors, concrete deck, and supporting beam.
2. Conform to ASTM A29 grades 1010-1020, Type B.
3. Provide shear stud connectors of uniform diameter, heads concentric and normal to shaft, and weld end chamfered and solid flux.

2.2 DESIGN OF CONNECTIONS

- A. Do not alter fully detailed connections without written approval. Where approved, design alternate connections to meet required capacities.
- B. Design schematically detailed connections to meet required capacities.
- C. Design connections to meet the following requirements:
 1. Completely and clearly detailed on shop drawings submittal.
 2. Minimum simple shear connection requirements, unless noted otherwise:
 - a. 5/16 inch thick plate at shear plate connections
 - b. 5/16 inch thick angles at double angle connections
 - c. Minimum two $\frac{3}{4}$ " ASTM F3125 bolts
 3. Moment connections to develop 100 percent of the flexural capacity of member.
- D. Do not use welds in combination with bolts in same face of any connection.
- E. Design connection at ends of tension or compression members to develop force due to provided design load. Where no design load is provided, design connections for 100 percent of tension capacity of member.

2.3 FABRICATION

- A. Fabricate in accordance with ANSI/AISC 303 and ANSI/AISC 360.
- B. Structural steel
 1. Provide members of required sizes, weights, shapes and lengths.
 - a. Do not alter member shapes or lengths or enlarge bolt holes in field for proper fit; return materials to fabrication shop for correction where required.
 - b. Do not splice members to achieve required lengths unless approved by Architect. Member splices approved for convenience of fabricator or erector allowed only at no additional cost to Owner.
 2. Prior to fabrication; straighten materials, remove twists/bends, and clean faying surfaces of scale and rust.
 3. Mark and match mark pieces where field assembly is required.
 4. Camber structural steel members where shown. Mark beams indicating direction of specified or natural camber. Fabricate beams with camber in the upward direction.
- C. Joints:
 1. Prepare bearing surfaces of compression joints by milling, sawing, or other suitable means.
- D. Thermal Cutting: Use mechanically guided thermal cutting when feasible.
 - a. Plane thermally cut edges to be welded in accordance with AWS D1.1/D1.1M.
- E. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
 1. Hole sizes to conform to AISC specifications.
 2. Holes for anchor rods in base plates may be oversized in accordance with AISC Specifications. Provide washers as indicated.
 3. Short-slotted holes:
 - a. Do not use short-slotted holes at trusses or primary lateral frame connections (collectors, vertical braces, moment frames, etc).
 - b. Where short-slotted holes are permitted:
 - 1) Orient short-slotted holes perpendicular to load direction.
 - 2) When slotted holes occur in an outer ply, provide washer to completely cover bolt hole.

- F. Cleaning:
 - 1. Clean and prepare surfaces in accordance with SSPC standards.
 - 2. Clean and prepare surfaces to receive paint per SSPC-SP2.

2.4 SHOP CONNECTIONS

- A. Welded Connections: Comply with AWS D1.1 and AISC 360 for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.
- B. Bolted Connections: Comply with RCSC's "Specification for Structural Joints using High-Strength Bolts" for bolt, washer, and joint type used.
 - 1. Joint types:
 - a. Snug-Tight Joint
 - 1) Provide snug-tight joints unless noted otherwise.
 - 2. Provide beveled washers for surfaces out of parallel more than 1:20.
 - 3. Provide bolts lengths such that sufficient thread engagement is achieved by bolt threads extending beyond or at least flush with the outer face of the nut.
 - 4. Store and handle bolts in accordance with referenced standards.
- C. Finger-Tight Connections:
 - 1. Provide where noted
 - 2. Finger-tighten nut, loosen half-turn, and disturb threads or apply thread compound to prevent nut from backing off.

2.5 COATINGS

- A. SHOP COATING
 - 1. Apply standard, rust-inhibiting primer to structural steel members, except:
 - a. Surfaces to be welded
 - b. Members to be encased in concrete
 - c. Members to be fireproofed
 - d. Surfaces to receive shear stud connectors
 - 2. Cleaning
 - a. Clean surfaces to remain uncoated in accordance with SSPC SP-2.
 - b. Clean surfaces to be coated in accordance with SSPC SP-2.
 - c. Clean AESS surfaces in accordance with SSPC SP-6.
 - d. Clean surfaces to be galvanized in accordance with SSPC SP-6.
 - 3. Provide minimum dry coating thickness of 1 mil.
 - 4. Repair damaged coating prior to delivery.
- B. GALVANIZING
 - 1. Comply with ASTM A123.
 - 2. Galvanize steel members exposed to weather.
 - a. Fill exposed vent and drain holes unless they function as weep holes, by plugging with zinc and filing smooth.
 - 3. Galvanize shelf angles supporting masonry or stone.

2.6 SOURCE QUALITY CONTROL

- A. Shop Tests and Inspections
 - 1. Allow Testing Laboratory access to materials in fabrication for shop tests and inspections.
 - 2. Bolted Connections: Inspect and test bolted connections in accordance with RCSC Specification for Structural Joints Using High-Strength Bolts
 - 3. Welded Connections: Inspect and test welded connections in accordance with AWS D1.1.
 - a. Perform non-destructive testing on welds not passing visual inspection.
 - b. Perform non-destructive testing on 100 percent of CJP welds
 - 4. Shear Stud Connectors
 - a. Inspect and test shear stud connectors in accordance with AWS D1.1
 - b. Perform bend test at studs where visual inspections reveal less than full 360 degree flash.

5. Remove and replace connections found to be faulty at no additional cost to Owner.
 6. Measure camber in the fabricator's shop in the unstressed condition
 7. Reinspect corrective measures required at no additional cost to Owner.
 8. Prepare test and inspection reports.
- B. Testing Laboratory not required to perform shop tests and inspections if fabricator participates in AISC Quality Certification Program and is designated as AISC Certified.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify condition and position of anchor rods, embeds and bearing surfaces prior to commencing erection.
- B. Correct misaligned or missing components prior to commencing erection.

3.2 SPECIAL REQUIREMENTS FOR ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (AESS)

- A. Definition: steel exposed to view in final construction.
- B. Section 10 of AISC 303 applies to steel identified as AESS.
- C. Fully weld tube-to-tube and pipe-to-pipe connections with no exposed bolts, fasteners, clips, or plates. Remove and grind smooth erection clips and bolts following final erection.
- D. Grind smooth exposed welds in AESS including plug, slot, V, groove, bevel, flare V and flare bevel welds. Fillet welds to be smooth and uniform, and visually acceptable to Architect.
- E. When exposed fillet welds are not required to be continuous, fill spaces between intermittent welds with metal filler or provide weld continuous for uniform appearance.
 1. Welds on exterior AESS and within six feet of any floor to be continuous. Metal filler is not permitted in these locations.
- F. Saw or shear edges of exposed plates to provide a uniform edge. Thermal cutting allowed only with approval of Architect and if uniform edges can be maintained.
- G. Use exposed fasteners only as indicated or as required for field connections. Exposed fasteners are not permitted for shop connections unless approved by Architect. When exposed fasteners are permitted, provide uniform and consistent connections, with connections of adjacent beams matching in size and arrangement to provide a consistent, uniform appearance. When exposed fasteners are permitted, use galvanized bolts.
- H. Field touch up AESS within 7 days of erection. Use same shop primer as field touch up paint, and apply by spraying exposed surfaces after proper preparation, including grinding, smoothing and cleaning.
- I. Mishandled or incorrectly stored AESS that results in steel and/or primer damage is subject to rejection upon review of Architect.

3.3 ERECTION

- A. The erector is responsible for means, methods and safety of erection of structural steel frame.
- B. Erect structural steel in accordance with AISC Specifications. Erect Work plumb, square, true to line, level and in proper position and orientation.
- C. Provide temporary bracing to maintain stability of framework during erection for stresses and loads due to erection equipment and its operation, weight of structure, wind, and temporary loads imposed during erection. Check and adjust bracing frequently during progress of erection and assembly. Maintain temporary bracing until all components of structure required for lateral stability are in place and final connections made.

- D. Do not stack materials on partially completed framework, or in a manner to cause damage or overloading of structure.
- E. Maintain tolerances per AISC 303.
 - 1. In addition to requirements of AISC 303, maintain column plumbness of:
 - a. 1:500 maximum variation of working line from plumb line
 - b. 1 inch maximum overall displacement from established column line
- F. Field Assembly:
 - 1. Assemble steel framework accurately to lines and elevations indicated and within specified tolerances. Align and adjust members forming parts of a completed frame before fastening.
 - 2. Thoroughly clean bearing surfaces and surfaces to be in permanent contact before assembly.
 - 3. Baseplates
 - a. Set plates for structural members on wedges, shims, or setting nuts as required.
 - b. Snug-tighten anchor rods after supported members have been positioned and plumbed.
 - c. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain.
 - d. Weld plate washers to base plates where required.
 - 4. Adjust bolt holes requiring enlargement only by reaming, not by drifting or burning.
 - 5. Erection bolts may be tightened and left in place, except in architecturally exposed work. Fill holes left from removed bolts by plug welding. Grind welds smooth where architecturally exposed.
 - 6. For members damaged during handling, submit corrective measures to Architect for approval, or replace without additional cost to Owner.
 - 7. Splice members only where indicated.
 - 8. Fit column compression joints and base plates in full contact bearing, with gaps not exceeding 1/16 inch, per the specification.

3.4 FIELD CONNECTIONS

- A. Welded Connections: Comply with AWS D1.1 and AISC 360 for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
 - 1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.
- B. Welded Connections of Galvanized Steel:
 - 1. Conform to AWS D19.0 for welding of zinc coated members.
 - 2. Cold galvanize welded connections after welding is complete.
- C. Bolted Connections: Comply with RCSC's "Specification for Structural Joints using High-Strength Bolts" for bolt, washer, and joint type used.
 - 1. Joint types:
 - a. Snug-Tight Joint
 - 1) Provide snug-tight joints unless noted otherwise.
 - 2. Provide beveled washers for surfaces out of parallel more than 1:20.
 - 3. Provide bolts lengths such that sufficient thread engagement is achieved by bolt threads extending beyond or at least flush with the outer face of the nut.
 - 4. Store and handle bolts in accordance with referenced standards.
- D. Finger-Tight Connections:
 - 1. Provide where noted
 - 2. Finger-tighten nut, loosen half-turn, and disturb threads or apply thread compound to prevent nut from backing off.

3.5 COATING REPAIR

- A. Repair damaged or missing galvanizing in accordance with ASTM A780.
- B. Where primer is damaged or missing, clean and repair to match shop coating.
- C. Clean and prime field welds as required to match shop coating.

3.6 INSTALLATION OF PRODUCTS

A. SHEAR STUD CONNECTORS

1. Prepare surfaces as recommended by manufacturer of shear stud connectors
2. Weld with automatic mechanized welding process in accordance with AWS D1.1 and manufacturer's instructions
3. Remove ceramic ferrules after welding
4. Do not weld studs when temperature is below zero degrees Fahrenheit.
5. Do not weld studs when surface is wet.

END OF SECTION

SECTION 05 31 13

STEEL COMPOSITE FLOOR DECKING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Composite metal floor deck
 - 2. Headed shear stud connectors

1.2 REFERENCES (Latest Edition)

- A. American Iron and Steel Institute (AISI):
 - 1. AISI S100, North American Specification for the Design of Cold-Formed Steel Structural Members.
- B. American Society for Testing and Materials:
 - 1. ASTM A29, Standard Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought.
 - 2. ASTM A653, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 3. ASTM A924, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
- C. American Welding Society (AWS):
 - 1. AWS A2.4, Standard Symbols for Welding, Brazing, and Nondestructive Examination.
 - 2. AWS D1.1, Structural Welding Code - Steel.
 - 3. AWS D1.3, Structural Welding Code – Sheet Steel
 - 4. AWS D9.1, Sheet Metal Welding Code.
- D. Steel Deck Institute (SDI):
 - 1. SDI SD, Standard for Steel Deck
 - 2. SD QA/QC, Standard for Quality Control and Quality Assurance for Installation of Steel Deck
 - 3. SDI FDDM, Floor Deck Design Manual

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's data indicating product compliance for the following:
 - 1. Composite Metal Floor Deck
 - a. Dimensions of individual components, profiles, and finishes.
 - b. Maximum unshored spans and allowable load data.
- B. Shop Drawings: Submit shop and installation drawings for review, including:
 - 1. Composite Metal Form Deck drawings:
 - a. Deck manufacturer, profile, gauge, grade, finish, and maximum unshored span.
 - b. Erection layouts, dimensions, number of spans per panel, support and joint locations.
 - c. Sections showing side and end details. Indicate bearing requirements.
 - d. Deck fastener types and attachment patterns at side, end, and interior supports.
 - e. Locations, details, and installation instructions for deck accessories including hardware, deck reinforcing, closure plates, pour stops, and girder fillers.
 - f. Dimensioned layout of openings indicated in Contract Documents and as required by other trades. Indicate whether penetration is formed prior to concrete placement or core-drilled after concrete placement.
 - g. Dimensioned layout of field-installed headed shear stud connectors. Details of stud layouts for beams and girders. Stud size, material type and grade.

1.4 QUALITY ASSURANCE

- A. Steel Deck:
 - 1. Manufacturer to be member of Steel Deck Institute.

- B. Welding:
 - 1. Welding Qualifications: Qualify procedures and personnel according to AWS D1.3.
 - 2. Maintain current AWS certification throughout duration of Project for welders employed on Work.
- C. If required by fastener manufacturer, certify that each mechanical fastener installer has satisfactorily passed qualification tests as required by fastener manufacturer.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deck:
 - 1. Deliver in bundles and store off ground. Slope to provide drainage. Protect from corrosion, deformation, and damage.
 - 2. Protect with ventilated, waterproof covering.
 - 3. Repair rusted areas on deck within 24 hours of detection.
- B. Headed Shear Stud Connectors:
 - 1. Store in dry condition, above ground.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. AISI Specifications: Comply with calculated structural characteristics of steel deck according to AISI S100 requirements.
- B. Bare steel deck capable of withstanding 50 psf uniform construction load, or wet weight of concrete plus 20 psf of uniform live load, or 150-pound concentrated load per one foot of deck width in accordance with SDI SD for construction loading.
- C. Use three-span continuous layouts where possible.

2.2 MATERIALS

- A. Shear Stud Connectors:
 - 1. Fusion welded, headed shear stud connectors with ferrules and accessories designed to create composite deck action by mating of shear stud connectors, concrete deck, and supporting beam.
 - 2. Conform to ASTM A29 grades 1010-1020, Type B
 - 3. Provide shear stud connectors of uniform diameter, heads concentric and normal to shaft, and weld end chamfered and solid flux.
- B. Composite Floor Deck
 - 1. Steel deck and accessories in conformance with ASTM A653 galvanized to G60 minimum.
 - 2. Profile depth, shape, thickness, and yield strength as indicated in Contract Documents.
 - 3. Fabricate panels with integrally embossed or raised pattern ribs and interlocking side laps complying with SDI-SD requirements.

2.3 ACCESSORIES

- A. Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.
 - 1. Mechanical fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.
 - 2. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head, self-drilling, carbon-steel screws.
 - 3. Column closures, end closures, cover plates, and girder fillers to be standard type provided by deck manufacturer unless indicated otherwise in Contract Documents.
 - 4. Pour Stops: Steel sheet of same material and finish as deck (minimum yield strength of 33,000 psi). Thickness and profile as indicated in Contract Documents.
 - 5. Girder Fillers: Steel sheet of same material and finish as deck (minimum yield strength of 33,000psi). Thickness and profile provided by deck manufacturer.
 - 6. Cold Galvanizing: Conform to ASTM A780.
 - 7. Piercing Hanger Tabs: Piercing steel sheet hanger attachment devices for suspension of ceilings compatible for use with deck.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Do not begin laying of deck units until supporting members are secured in place and their end connections completed. Examine support framing and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of Work. Proceed with installation only after unsatisfactory conditions are corrected.
- B. Do not use corroded, deformed, or damaged deck. Replace damaged deck with new material at no additional cost to Owner.
- C. Clean rust, oil, grease, paint, and debris from areas where anchors are to be welded.

3.2 INSTALLATION

- A. Lay and align units as follows:
 - 1. Prevent stretching or contracting of sidelaps.
 - 2. Do not use deck units that are bent, kinked, or otherwise damaged such as to prevent proper interlocking and connection of edges to adjacent units.
 - 3. Install deck panels and accessories according to SDI SD and in accordance with approved installation drawings.
 - 4. Place deck panels on structural supports and adjust to final position with ends and flutes aligned. Attach firmly to supports immediately after placement.
 - 5. Cut and neatly fit deck units and accessories around openings and other Work projecting through or adjacent to decking.
 - 6. End bearing: Install deck ends over supports with minimum end bearing of 1 1/2" or as required by manufacturer.
 - 7. Do not store materials on installed deck prior to fastening to supporting structure.
- B. Installation of Composite Floor Deck
 - 1. Fasten deck and accessories in accordance with requirements of SDI SD:
 - a. General:
 - 1) Minimum fastener edge distances in accordance with AISI S100
 - 2) Bring deck bearing surfaces into contact as required by fastening method.
 - b. Deck Support Attachment: Anchor steel deck to structural supports with 5/8-inch diameter arc spot welds or 1/8-inch x 1 1/2-inch-long fillet welds.
 - 1) Do not exceed 16 inches on center average attachment spacing of deck at supports perpendicular to span. Do not exceed 18 inches on center maximum attachment spacing, unless noted otherwise.
 - 2) Do not exceed 36 inches on center attachment spacing at supports parallel to span.
 - c. Deck Sidelap Fastening:
 - 1) Fasten sidelaps at intervals not to exceed 36 inches on center, unless noted otherwise, using one of the following methods:
 - a) Screws with a minimum diameter of 0.190 inches (#10 diameter)
 - b) Crimp or button punch
 - c) Arc spot welds with a minimum 5/8-inch visible diameter or minimum 1/8-inch x 1 1/2-inch-long fillet weld.
 - d) Welded sidelaps not permitted at deck thickness less than 0.0358 inch (20 ga)
 - 2. Attach deck accessories (pour stops, girder fillers, deck closures) in accordance with approved installation drawings.
 - 3. Replace defective deck connections before concrete placement.
- C. Openings in deck:
 - 1. Follow approved layout submitted to Architect.
 - 2. Leave deck intact and use blockouts to form openings.
- D. Conduit in deck:
 - 1. Conduit is not permitted in composite deck.
- E. Do not damage or overload deck during construction.

- F. Install inserts to support ceiling hangers. Provide minimum of one ceiling insert for every 4 square feet of ceiling.

3.3 SHEAR STUD CONNECTOR INSTALLATION

- A. Prepare surfaces as recommended by manufacturer of shear stud connectors
- B. Weld with automatic mechanized welding process in accordance with AWS D1.1 and manufacturer's instructions
- C. Remove ceramic ferrules after welding.
- D. Do not weld studs when temperature is below zero degrees F.
- E. Do not weld studs when surface is wet.

3.4 REPAIRS

- A. Prior to concrete placement, inspect deck for tears, dents, or other damage. Replace or repair damaged deck prior to concrete placement.
- B. Galvanizing Repairs: Prepare and repair damaged galvanizing coatings on both surfaces of deck with galvanized repair paint according to ASTM A780 and manufacturer's written instructions.
- C. Paint Repairs: Wire brush and clean rust spots, welds, and abraded areas on prime-painted deck immediately after installation and apply repair paint compatible with primer and deck.

END OF SECTION

SECTION 05 40 00

COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior non-load-bearing wall framing.
 - 2. Interior load-bearing wall framing.
 - 3. Floor joist framing.
 - 4. Soffit framing.
 - 5. Cold-formed steel angles at wall openings and copings.
 - 6. Used in other areas noted in drawings or required by delegated design.
- B. Related Sections:
 - 1. Section 05 12 00 - Structural Steel Framing.
 - 2. Section 05 50 00 - Metal Fabrications: steel angles.
 - 3. Section 06 16 56 - Air- and Water-Resistive Sheathing Board System.
 - 4. Section 09 21 16 - Gypsum Board Assemblies: non-loadbearing partition studs.

1.2 SYSTEM DESCRIPTION

- A. Masonry Veneer: The exterior non-load-bearing curtain wall system shall be designed to withstand both positive and negative pressure with a maximum deflection of L/600 of stud span. If stud span for 6" and 8" 18 gage stud exceed L/600, either increase stud gage, decrease stud spacing, or add light-gage bracing to control deflection to L/600.
- B. All Other Veneer/Cladding: The exterior non-load-bearing curtain wall system shall be designed to withstand both positive and negative pressure with a maximum deflection of L/240 of stud span. If stud span for 6" and 8" 18 gage stud exceed L/240, either increase stud gage, decrease stud spacing, or add light-gage bracing to control deflection to L/240.
- C. Interior ramps shall be built to withstand a live load of 75 lbs./sq. ft. with no horizontal member supporting plywood subflooring more than 12" o.c.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site prior to commencing Work. Attendees shall include Architect's Structural Engineer, Cold-Formed Metal Framing Engineer, Cold-Formed Metal Framing Installer, and Owner's Testing Lab.

1.4 SUBMITTALS

- A. Product Data: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. Include manufacturer's specifications, load tables, dimension diagrams, anchor details, installation instructions for products to be used in lightgage framing work, and type and location of fasteners. Describe materials and finish, product criteria, and limitations.
- B. Structural Calculations: Submit structural calculations prepared by manufacturer for review by project engineer.
 - 1. Description of design criteria.
 - 2. Engineering analysis depicting stress and deflection (stiffness) requirements for each framing application. This shall include cold-formed steel angles around exterior glazing system openings, exterior door openings, and exterior louver openings as detailed.
 - 3. Selection of framing components and accessories.
 - 4. Verification of attachments to structure and adjacent framing components.
 - 5. Sealed by a professional engineer registered in the state where the project is located.
 - 6. Engineer shall have a minimum of 5-years' experience with projects of similar scope.
- C. Shop Drawings: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. Drawings shall incorporate fabrication and erection details.

- D. Evaluation Reports: For post-installed anchors, from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.5 QUALITY ASSURANCE

- A. All structural members shall be designed in accordance with AISI "Specifications for the Design of Cold-Formed Steel Structural Members", latest edition.
- B. Qualifications: Welders and welding procedures shall comply with the requirements of ANSI/AWS D1.3 Structural Welding Code.

1.6 DELIVERY AND STORAGE

- A. Protect metal members from rusting and damage. Deliver to project site in manufacturer's containers or bundles, fully identified with name, brand, type and grade. Store off the ground in a dry, ventilated space.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Lightgauge Steel Framing: Basis of Design ClarkDietrich Building Systems (phone 800.543.7140 web site: www.clarkdietrich.com). ASTM A 1003, Provide Metal Framing, 18 gage minimum with 1-5/8" flange minimum, structural stud framing members. Refer to structural drawings for specific size, type, and locations of framing which may be used on the project.
- B. Substitutions: Under provisions of SECTION 01 62 00 - PRODUCT OPTIONS. Other acceptable manufacturers with products of equal substance and function include:
 - CEMCO Steel
 - Mill Steel Company
 - The Steel Network
- C. Furnish bridging and bracing members shown or required for a complete and structurally sound installation.
- D. Track: Formed steel; channel shaped; same width and finish as studs, tight fit; 18 gage thick, solid web.

2.2 ACCESSORIES

- A. Slide Clips: ASTM A 653, Grade A, galvanized metal clip.
 - 1. ASTM A 653, Grade C, galvanized metal clip.
 - 2. Designed and manufactured for attachment of metal stud framing to edge of structural steel framing.
 - 3. Permits differential vertical movement between stud and floor or roof structure.
 - 4. Clip and its connection to structure shall be adequate to safely brace metal studs to resist design lateral load of at least 330 pounds (allowable stress increase permitted by Building Code already taken into account).
- B. Bracing and Furring: Formed sheet steel, thickness determined for conditions encountered, manufacturer's standard shapes, same finish as framing members.
- C. Bridging: 1-1/2" C.R. channels, 16 ga; same finish as framing members.
- D. Plates, Gussets, Clips: Formed sheet steel, thickness determined for conditions encountered, manufacturer's standard shapes, same finish as framing members.
- E. Galvanizing Repair Paint: Organic Zinc-Rich coating containing 95% metallic zinc, by weight in the dried film; recognized under the Component Program of Underwriter's Laboratories, Inc. as an equivalent to hot-dip galvanizing; conforming to Federal Specification DOD P-21035A for repair of hot-dip galvanizing; as manufactured by ZRC Worldwide (phone 800.831.3275 web site: www.zrcworldwide.com). Provide Z.R.C. Cold Galvanizing Compound.
- F. 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 as required.

- G. Supplementary Framing: Fabricate other steel-framing accessories from ASTM A 1003, Structural Grade, Type H, metallic coated steel sheet, of same grade and coating designation used for framing members. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated.

2.3 FASTENERS

- A. Self-drilling, Self-tapping Screws, Bolts, Nuts and Washers: ASTM A 90, hot dip galvanized.
- B. Anchorage Devices: Power driven as recommended by manufacturer for size and spacing.
- C. Welding Electrodes: Comply with AWS standards D1.1 and D1.3.
- D. Post-Installed Anchors (for securing perimeter angle to masonry or concrete structure): Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC193, ICC-ES AC58 or ICC-ES AC308 as appropriate for the substrate; zinc coated by hot-dip process according to ASTM A 153, Class C.

2.4 FABRICATION

- A. General: Framing components may be prefabricated into panels prior to erection. Cut framing components accurately to fit squarely against abutting members. Hold members firmly in position until properly fastened. Prefabricated panels shall be square and braced against racking. Attach similar components by welding.
- B. Protective Finishing: Paint abraded surfaces and welds after fabrication, using galvanizing repair paint for galvanized surfaces.

2.5 FINISHES

- A. All framing members shall be formed from hot-dip galvanized steel, G60 (Z180) coating conforming to the requirements of ASTM A 1003, Structural Grade, Type H.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install steel framing members and accessories in accordance with the manufacturer's instructions and the erection drawings. Spacing of studs shall not exceed 16" o.c.
- B. Install sealer gaskets at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.
- C. Securely anchor track to floor and overhead structure or member. Seat studs squarely in the track with the stud flange securely attached to the flanges of both upper and lower track.
 - 1. Attach structural components by welding, bolting or with self-drilling screws.
 - 2. Wire tying of framing components in structural applications will not be permitted.
- D. Touch-up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint and paint exposed areas with same material used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils. For galvanized surfaces, apply galvanizing repair paint.
- E. Construct corners using minimum three studs. Double stud at wall opening, door, and window jambs.
- F. Provide vertical stud within 12 inches of jamb for brick anchor attachment at openings. Reference BIA Technical Note 28B.
- G. Provide rows of horizontal bridging welded in place at spacing recommended by stud manufacturer to resist lateral forces and stud rotation.

3.2 TOLERANCES

- A. Maximum Variation from True Position: $\pm 1/8$ " from plan location.
- B. Maximum Variation of any Member from Plane: $1/8$ " in 10 feet.

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Miscellaneous metal work and related items.
- B. Related Sections:
 - 1. Section 05 12 00 - Structural Steel Framing.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance of Stairs: Provide metal stairs and support connections capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Uniform Load: 100 lbf/sq. ft.
 - 2. Concentrated Live Load: 300 lbf applied on an area of 4 sq. in.
 - 3. Uniform and concentrated loads need not be assumed to act concurrently.
 - 4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
 - 5. Limit deflection of treads, platforms, and framing members to L/360 or 1/4 inch, whichever is less.
- B. Structural Performance of Railings: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Handrails:
 - a. Uniform load of 50 lbf/ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 2. Top Rails of Guards:
 - a. Uniform load of 50 lbf/ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 3. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
 - b. Infill load and other loads need not be assumed to act concurrently.
- C. Structural Performance of Ladders: Provide ladders and ship's ladders capable of withstanding the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.

1.3 SUBMITTALS

- A. Shop Drawings: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. Include details of each metal fabrication, including setting drawings for anchor bolts and other required anchors.
- B. Submit structural calculations prepared by manufacturer for review by project engineer. Shop drawings and calculations shall be sealed by a professional engineer registered in the State of Texas.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel: ASTM A 36, shapes, plates and bars.
- B. Threaded Fasteners: ASTM A 307, Grade A, bolts and nuts.
- C. Stud Anchors: Provide headed stud anchors with a smooth shank of carbon steel with a minimum tensile strength of 60,000 psi, as manufactured by Nelson Stud Welding Div. or KSM Welding Systems Div.

- D. Expansion Bolts: Fed. Spec. FF-S-325, Group II, Type A, Class 1. Provide Hilti Kwik-bolt or Ramset Trubolt stud anchors.
- E. Galvanizing Repair Paint: Organic Zinc-Rich coating containing 95% metallic zinc, by weight in the dried film; recognized under the Component Program of Underwriter's Laboratories, Inc. as an equivalent to hot-dip galvanizing; conforming to Federal Specification DOD P-21035A for repair of hot-dip galvanizing; as manufactured by ZRC Worldwide, Marshfield, MA (phone 800.831.3275 web site: www.zrcworldwide.com). Provide Z.R.C. Cold Galvanizing Compound.
- F. Stainless Steel: Grade and type designated below for each form required:
 - 1. Pipe: ASTM A 312, Grade TP 304.
 - 2. Tubing: ASTM A 312, Grade MT 304.
 - 3. Castings: ASTM A 743, Grade CF 8 or CF 20.
 - 4. Plate and Sheet: ASTM A 240 or ASTM A 666, Type 304.
 - 5. For stainless steel railings, provide fasteners fabricated from type 304 stainless steel.

2.2 FABRICATION

- A. Fabricate and assemble metal work in the shop to the greatest extent possible.
 - 1. Metal surfaces shall be clean and free of mill scale and rust pitting, well-formed to shape and size with sharp lines and angles. Shearing and punching shall leave clean true lines and surfaces. Exposed ends and edges shall be milled smooth with corners slightly rounded.
 - 2. Weld shop connections to the extent practical; finish exposed welds smooth. Weld joints shall be flush.
 - 3. Cut, drill or punch holes; do not make or enlarge by burning. Provide holes where required for connecting the work of other trades.
 - 4. Conceal fastenings where practical. Thickness of metal and method of assembly and support shall give ample strength and rigidity.
 - 5. Assemble parts so that joints are tight, members are in good alignment, and the finished work reproduces the drawing details as intended.
 - 6. Stud Anchors: Weld stud anchors to miscellaneous shapes using welding equipment and procedures recommended by the manufacturer of the stud anchors used.
- B. Punching: At hollow structural sections located in the exterior building envelope, provide shop-punched holes in steel sections as indicated on drawings, for installation of sprayed foam insulation to completely fill hollow structural section cavity.
- C. Shop Painting:
 - 1. Carbon steel surfaces shall be cleaned, degreased, and shop coated with a straight alkyd, zinc chromate, rust inhibitive paint applied by brush or spray. Steel to be encased in concrete need not be painted.
 - 2. Aluminum surfaces to be in direct contact with concrete and masonry shall be shop coated with zinc chromate primer.
- D. Galvanizing: Provide a zinc coating for those items indicated or specified to be galvanized, as follows:
 - 1. ASTM A 153 for galvanizing iron and steel hardware.
 - 2. ASTM A 123 for galvanizing rolled, pressed and forged steel shapes, plates, bars and strip 1/8" thick and heavier, and for galvanizing assembled steel products.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Deliver, store and erect metal work in such manner that the parts are not damaged or deformed. Install the work true to line, plumb, level, in proper alignment with other work, and free of sags, buckles and other objectionable defects. Anchorage shall be adequate to safely resist all stresses to which the work will normally be subjected.

- B. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint and paint exposed areas with same material used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils. For galvanized surfaces, apply galvanizing repair paint.

3.2 MISCELLANEOUS METAL SCHEDULE

- A. General: The following is a general list of the metal work to be furnished under this section of the specifications. Other items of miscellaneous metal work shown and noted on the drawings and not mentioned elsewhere in the specifications shall be furnished as though specifically described herein.
- B. Loose Lintels: Lintels of steel shapes and plates where required at exterior veneer and as detailed.
 - 1. End bearing shall be at least 8".
 - 2. Where steel lintels are not specifically called out, furnish at least one steel angle for each 4" thickness of masonry in the wall.
 - 3. Wrap bearing ends of lintels with flashing to achieve a bond breaker between the lintel and the masonry.
 - 4. Galvanize steel lintels located in exterior walls.
- C. Interior Trench Cover: Provide Trench Cover Type TST as manufactured by Balco, Inc. at interior wire trenches.
 - 1. Plate Thickness is 1/4"
 - 2. Trench Covers shall be aluminum, ASTM B 209, alloy 6061-T651 for plate; Frames shall be aluminum, ASTM B221, alloy 6063-T5 for extrusions. Trench cover shall have 1/8" recessed surface for carpet/VCT finish to match surrounding floor finish.
 - 3. Finish: Exposed aluminum surfaces shall be mill finish. Aluminum surfaces in contact with concrete shall be prime painted.
 - 4. Fabrications: Fabricate trench cover assemblies as detailed. Provide splice covers and closures as necessary for complete installation. Fabricate splices, special transitions, corner units, corner fittings, intersections, and end closures as required. Miter and weld joints shall be factory manufactured. Provide necessary and related parts, devices, anchors, and other items required for water-resistant installations.
 - 5. Provide 4"L removable cover piece at ends of each trench that can be secured in place when trench is not in use.
 - 6. Installation:
 - a. Contractor shall verify that field measurements are as shown on shop drawings prior to releasing materials for fabrication by the manufacturer.
 - b. Installer shall examine conditions under which work is to be performed and shall notify the contractor in writing of unsatisfactory conditions. Installer shall not proceed until unsatisfactory conditions have been corrected in a manner acceptable to the installer.
 - c. Install trench covers in accordance with the manufacturer's written installation instructions. Anchors shall be spaced at 10 inches o.c.
 - d. Align work plumb, level, and, as required, flush with adjacent surfaces.
 - e. Make allowances for change in trench size due to difference between installation and existing building construction.
 - f. Clean exposed surfaces as recommended by the manufacturer.
- D. Pipe Rails: Handrails and railings of standard black steel pipe with fittings as detailed.
 - 1. Bend pipe to smooth curves without kinks. Make joints and connections flush and smooth. Grind rough edges and exposed welds smooth; dress to profile.
 - 2. For railings, space the posts as shown but not more than 4 ft. apart. Install posts into pipe sleeves set in the concrete; grout each post tight with low viscosity epoxy grout.
 - 3. Provide slip flanges where posts are set into concrete and where rails terminate against walls.
 - 4. Railings shall be designed and installed to meet loads and stresses as referenced in "Performance Requirements" Article within this specification section.
 - 5. For wall mounted handrails, provide malleable iron brackets having the mounting hole countersunk for a flat head machine screw to finish flush with the surface. Space brackets not more than 4 ft. apart. Fabricate returns from plates and welding elbows. Anchor returns and brackets with built-in anchor plates.
 - 6. Handrails shall extend a minimum of 12" beyond the top riser of a stair and the top and bottom of a ramp. Handrails shall extend one tread width beyond the bottom riser of a stair.
 - 7. Galvanize exterior pipe handrails and railings after fabrication.

- E. Roof Curbs: Fabricate curbs of steel angles, channels and plates at roof openings for ducts, exhaust fans and other set-on items.
 - 1. Miter and weld corners.
 - 2. Bolt or weld curbs to roof framing members.
- F. Storefront Bracing: Provide braces of steel angles, channels and plates to reinforce and stiffen the head of the aluminum storefront framing.
- G. Track Supports: Provide framing and brackets of steel shapes as detailed to support folding panel partition.
 - 1. Erect to be level, straight and rigid.
 - 2. Punch for mounting bolts as required.
- H. Pipe Rail Supports: Support light support rail of standard black steel pipe with fittings as detailed for the lighting pocket in the ceiling.
 - 1. Hang the support rail from the structure above with braced pipe struts spaced 48" o.c. Rail shall be straight and level.
 - 2. Furnish slip flanges where pipe struts penetrate gypsum board ceiling.
- I. Cast Iron Gratings: Standard duty cast iron gratings and frames of the type and size detailed for the concrete catch basins and tree grates.
 - 1. Set frames flush with the concrete and loose in the frames at catch basins.
- J. Areaway Steel Grating: Provide the following steel grating at areaways:
McNichols #GW-75 Galvanized grate
- K. Ladders: Fabricate ladders of steel bars and shapes.
 - 1. Weld all connections.
 - 2. Bolt ladders to floor and wall with steel brackets and clips.
 - 3. Ladder Rungs: Provide SlipNOT®, grit-free, mill finish steel Grade #2 – Medium rungs as manufactured by the W.S. Molnar Company (1-800-SlipNOT) or approved equivalent. Reference drawings for dimensions. Steel shall incorporate an anti-slip primarily martensitic steel surface covering 100% of the substrate consisting of a random hatch matrix with a surface hardness between 55 – 63 on the Rockwell "C" scale and a surface to substrate bond strength of at least 4,000 psi. The non-slip surface shall have a minimum coefficient of friction of 0.8 and be listed as slip resistant by Underwriters Laboratories.
 - 4. Galvanize exterior ladders after fabrication. Reference Manufacturer's galvanizing guidelines, as to not damage the anti-slip surface.
 - 5. Fall Arrest System: Provide 3M™ DBI-SALA® Lad-Saf™ Cable Vertical Safety System as manufactured/provided by Rooftop Anchor, Inc.
 - a. Provide on ladders 24 feet in length or longer. Also provide at ladders where any portion occurs a minimum of 24 feet above finish floor, surface, or grade.
 - b. This system is a 2-user, stainless steel vertical safety system (vertical lifeline) that meets the new ANSI Z359.16 standard, along with OSHA 1910.140 and 1926.502, when used with the Lad-Saf X3 Detachable Cable Sleeve (6160054) and Lad-Saf X2 Detachable Cable Sleeve (6160030). It includes the top and bottom brackets and 20' of swaged 3/8 inch 1x7 galvanized steel cable.
- L. Aluminum Ships Ladders: As manufactured by O'Keeffe's Inc. (415) 824-4900
 - 1. Ship Ladder: Provide Model Number 520
 - a. Rungs no less than 1-1/4" high, 4-1/8" deep and 2'-0" wide.
 - b. Tread spacing shall be 1'-0" on center and angle of rise shall be 75 deg., as shown on drawings.
 - c. Channel Side Rails: Shall be no less than 1/8" wall thickness by 2" x 6".
 - d. Handrails shall be aluminum pipe, no less than 1-1/2" in diameter, with hemispherical aluminum end caps.
- M. Bollards: Provide bollards of size indicated, extend 3' below grade and 4' above grade, fabricated of Schedule 40 steel pipe, galvanized with G90 coating. Fill bollards with 3000 psi concrete, finish with domed top.
- N. Gates: Provide gates of structural steel tubing of the sizes and spacing as detailed. Miter corners and weld all connections.
 - 1. Frame: Structural steel plate as detailed.

2. Installation: Frame shall be anchored to masonry wall with adjustable anchors to fit masonry joints. Install hardware and hang the gates. Adjust gates to operate smoothly and easily. Make gates secure against entry when locked.
 3. Galvanize gates after fabrication.
- O. Fence: Provide fence of steel tubing and channels of the size, shape, and spacing as detailed.
1. Miter corners and weld connections.
 2. Installation: Fence to be erected plumb and straight.
 3. Galvanize fence after fabrication.
- P. Brick Vents: Provide aluminum brick vents 2-1/2"W x 3-5/8"D x length indicated on drawings, as manufactured by Construction Specialties, Inc.
- Q. Roof Edge Angles: Provide steel angles along roof edges to support wood nailers.
1. Weld angles to steel framing unless otherwise indicated.
- R. Safety Nosings: Wooster Type 101 abrasive cast aluminum nosings as detailed for concrete steps.
1. Nosings shall be 3" wide by 12" shorter than the length of tread on which installed.
 2. Furnish nosings with anchors for casting into the concrete as it is placed.
- S. Folded Metal Soffit Ventilating Plate: Form from 0.032 gauge aluminum perforated sheet, 1/16" round perforations, as manufactured by McNichols Co. - (phone 800 237-3820).
- T. Metal Bar Gratings: 3/16" wide bars at 15/16" o.c., welded steel grating meeting "Standard Specifications for Metal Bar Grating and Metal Bar Grating Treads" as published in ANSI/NAAMM A202.1 "Metal Bar Grating Manual".
1. Surface: Plain
 2. Finish: Hot-dipped galvanized.
 3. to strings and headers; fabricate and join so that bolts, if used, do not appear on finish surfaces.
- U. Downspouts: 6" x 6" x 3/16" thick steel tubing fabricated per details.
1. Hot-dip galvanized, paint grip G90, entire assembly per ASTM A 123 Class B-1, with a minimum of 0.2 oz. per sq. ft. surface.
- V. Structural Steel Door Frame for Jamb Mounted Rolling Doors: Frames of carbon steel shapes, bars and plates, fully welded, uniform, square, and true, as detailed for the rolling doors.
1. Miter and weld corner joints and grind exposed welds smooth.
 2. Weld 14 gage strip anchors to frame jambs, spaced 24" o.c. to work masonry bed joints.
 3. Continuously weld exposed joints; grind exposed welds smooth.
 4. Provide necessary reinforcements and drill and tap as required for finish hardware.
 5. Provide steel strap anchors for securing door frames into adjoining masonry. Weld anchors to frame jambs no more than 12" from both bottom and head of frame and space anchors not more than 30" apart.
 6. Galvanize exterior structural steel door frames and anchors.
- W. Stainless Steel Railings: Railings of square and round stainless steel tubing and steel plate as detailed.
1. Rails shall be 2" x 2" x 0.065" wall square stainless steel tubing, No. 4 finish.
 2. Posts shall be 1-1/4" O.D. x 11-gage round stainless steel tubing, No. 4 finish.
 3. Shop connections shall be electrically welded to the extent practical using stainless steel welding rods. Grind and polish welds to the original finish of the metal and remove weld discolorations on exposed surfaces by electro-chemical methods.
 4. Bend tubing to smooth curves without kinks or distortions. Make joints and connections flush and smooth.
 5. All exposed mechanical fasteners used in the assembly of the railings shall be stainless steel.
- X. Cast Iron Downspout Boots: Provide cast iron downspout boots as manufactured by J.R. Hoe, 800-245-5521, www.downspoutboots.com or approved equivalent. Provide sizes and configurations indicated on drawings. Boots shall be factory primed.
- Y. Trench Covers: Provide cast iron, heavy duty trench drain and cover, # TGMB-10 x 10 LF, as manufactured by McKinley Iron Works.

- Z. Miscellaneous Steel Shapes: Channels, wide flange shapes, angles, plates, tubing, connections, and bolts where shown and detailed on Drawings. Hot-dip galvanize where exposed to weather or touching exterior masonry after fabrication. Set mechanical unit frames directly on joists, not on deck. Provide an angle frame supported by structure around all roof penetrations including hatches and ductwork.

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Wood blocking and nailers, wood furring and grounds, plywood sheathing, subflooring and plywood backing panels.
- B. Related Sections:
 - 1. Section 06 40 00 - Architectural Woodwork.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
- B. Product Data:
 - 1. Include all data for rough carpentry products required for installation.
 - 2. Fire-retardant-treated wood product data, including certification by treating plant that treated materials comply with specified standard and other requirements as well as data relative to bending strength, stiffness, and fastener-holding capacities of treated materials.
- C. Warranty: Provide warranty of chemical treatment manufacturer for each type of treatment.

1.3 QUALITY ASSURANCE

- A. Lumber Grading: Lumber Grading Rules and Wood Species in accordance with Voluntary Product Standards. Grading rules of following associations apply to materials furnished.
 - 1. Southern Pine Inspection Bureau (SPIB).
 - 2. West Coast Lumber Inspection Bureau (WCLIBB).
 - 3. Western Wood Products Association (WWPA).
- B. Grade Marks: Identify lumber and plywood by official grade mark.
 - 1. Lumber: Include symbol of grading agency, mill name, grade, species, grading rules and condition of seasoning at time of manufacturer.
 - 2. Plywood: Include type, span rating or group number, exposure durability classification, and agency mark of APA.

1.4 QUALIFICATIONS

- A. Design structural site fabricated items under direct supervision of a professional structural engineer experienced in design of this work and licensed in the State of Texas.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, handle, and protect products in accordance with SECTION 01 65 00 - PRODUCT DELIVERY REQUIREMENTS and 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS.
- B. Store products above ground, on platforms or skids, and covered with waterproof coverings. Provide for adequate air circulation.
- C. Do not store seasoned materials in damp or wet locations.
- D. Support products in such a way as to prevent warping and distortion.

1.6 WARRANTY

- A. Provide a 20-year warranty for each type of chemical treatment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Wood: Lumber for framing and general carpentry work shall be sound, well manufactured, surfaced S4S material with a moisture content limit of 19%.
 - 1. Dimension: SPIB grade marked No.2 Dimension Southern Pine or WCLB grade marked No. 2 Dimension Douglas Fir.
 - 2. Boards: SPIB grade marked No. 2 Boards Southern Pine.
 - 3. Redwood: RIS grade marked Construction Heart California Redwood.
- B. Plywood: Plywood for general carpentry work shall be APA trademarked, 23/32" minimum thickness, Tongue & Groove.
 - 1. Interior: APA Rated Sturd-I-Floor, 24 oc, Exposure 1, fire-retardant treated.
 - 2. Exterior: APA Rated Sturd-I-Floor, 24 oc, Exterior, fire-retardant treated.
- C. Rough Hardware:
 - 1. Anchors, bolts, screws, and spikes shall be of proper types and sizes to support the work, to draw the members into place, and to hold them securely. Bolt heads and nuts bearing on wood shall have standard washers.
 - 2. Metal fasteners to secure wood grounds and blocking to masonry and concrete shall be of the type best suited to the conditions and spaced no more than 16" o.c. Wood plugs and nailing blocks are not acceptable.
 - 3. Nails shall be of the sizes and types intended for the particular use.
 - 4. Rough hardware exposed to the weather or embedded in exterior masonry and concrete walls or slabs shall be hot-dipped galvanized.
 - 5. Nails and bolts used with preservative treated lumber shall be hot-dipped galvanized.

2.2 WOOD TREATMENT

- A. Preservative Treatment:
 - 1. Comply with applicable requirements of AWWA U1; Category UC2 for interior construction not in contact with ground, Category UC3b for exterior construction not in contact with ground, and Category UC4a for items in contact with ground.
 - a. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
 - b. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
 - 2. Kiln-dry lumber and plywood after treatment to a maximum moisture content of 19% for lumber and 15% for plywood. Do not use material that is warped or that does not comply with requirements for untreated material
 - 3. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.
- B. Fire-Retardant Treatment:
 - 1. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
 - 2. Wood shall be fire-retardant chemically treated and pressure impregnated; with a flame spread index of 25 or less and a smoke development of 0-450 when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 3. Treatment shall not promote corrosion of metal fasteners.
 - 4. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - 5. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 - 6. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841

7. Kiln-dry lumber and plywood after treatment to maximum moisture content of 19% for lumber and 15% for plywood.
 8. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.
- C. If cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment. Inspect each piece of lumber or plywood after drying; discard damaged or defective pieces.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General

1. Discard units of material with defects which might impair quality of work, and units which are too small to fabricate work with minimum joints or optimum joint arrangement.
2. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted. Scribe and cope as required.
3. Securely attach carpentry work to substrates by anchoring and fastening as required by recognized standards and as required to draw members into place and securely hold same unless otherwise indicated. Use washers under all bolt heads.
4. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials.
5. Make tight connections between members to develop full strength of members.
6. Install fasteners without splitting of wood.
7. Pre-drill as necessary.
8. Comply with APA E30 requirements for plywood.
9. Install fasteners at spacings recommended by AFPA National Design Specifications for Stress Grade Lumber and Its Fastening - 1973 for lumber and APA Guide E30 for Plywood, unless more restrictive code requirements dictate tighter spacing or heavier fasteners.
10. Locate members as indicated on the drawings. Size, spacing or spans shall not be changed without specific approval of Architect. Take care to place proper grades and species of members where indicated in accordance with the lumber schedule herein.
11. Temporary brace framing at the end of each days' work until all framing is completed and securely anchored. Leave temporary bracing in place as long as required for safety. As work progresses, securely connect work to compensate for dead load, wind and erection stresses.

B. Framing: Frame members properly; fit closely, set accurately and secure rigidly in place. Do not splice between bearing points. Do not use shims for leveling on wood and metal bearings. Slate or tile shims may be used for leveling on masonry and concrete.

1. Stud walls and partitions shall have single bottom plates bolted to the concrete not more than 4 ft. o.c. and double top plates with staggered joints. Space studs on 16" centers. Double the studs at all openings. At masonry walls, bolt the end studs to the masonry.
2. Spike beams and joists to wood bearings and at lapped ends. Frame headers and trimmers around openings, making allowance for passage of pipes and ducts to avoid injurious cutting of structural members.
3. Framing shall be closely fitted, accurately set to the required lines and levels, and securely spiked and bolted in place. Provide all bracing required to obtain rigid structures.

C. Plywood Paneling: Arrange in uniform width.

1. Install in full lengths without end joints.
2. Install with uniform end joints. Locate end joints only over furring or blocking.
3. Fasten paneling with trim screws, set below face and filled.

D. Shoring: Construct shoring for masonry where required. Brace and maintain it until the mortar has set sufficiently to permit removal.

E. Blocking: Install 2x6 wood blocking between studs to stiffen the structure and for the support of other work. Provide 2x6 blocking for installation of wall-mounted objects.

F. Nailers: Install nailers of adequate size where detailed. Nailers shall be bolted in place. Where bolt sizes and spacing are not specifically noted, use not less than 3/8" bolts at 32" o.c., staggered.

G. Roof Curbs: Construct wood curbs as detailed to frame openings and support flashings in roof decks.

- H. Bucks: Install wood bucks for frames as required. Members shall be at least 2 x 4 material. Spike securely together. In masonry, provide 16 ga. corrugated metal jamb anchors screwed to the back and spaced to work masonry bed joints, not more than 32" apart.
- I. Bridging: Install cross-bridging between wood joists where the span exceeds 8 ft. Use 1 x 4 material and bevel cut the ends to fit. Drive tight and double nail each end.
- J. Plywood Backing Panels: Screw attach through gypsum board to supports.

3.2 PROTECTION

- A. Protect products from moisture absorption and subsequent warping or deterioration until subsequent construction can proceed.

END OF SECTION

SECTION 06 16 56

AIR- AND WATER-RESISTIVE SHEATHING BOARD SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Vapor-permeable, air- and water-resistive wall sheathing.
 - 2. Site-fluid-applied, vapor-permeable air barrier flashing.
 - 3. Accessories.
- B. Related Sections:
 - 1. Section 01 45 00 - Quality Control: for general mockup requirements.
 - 2. Section 01 45 23 - Testing and Inspection Services: for coordination with testing agency.
 - 3. Section 05 40 00 - Cold-Formed Metal Framing: for structural framing support of panels.
 - 4. Section 06 10 00 - Rough Carpentry: wood blocking and nailers.
 - 5. Section 07 11 13 - Bituminous Dampproofing: behind below-grade masonry veneer and at non-conditioned buildings.
 - 6. Section 07 27 26 - Fluid-Applied Membrane Air Barriers: air barrier on masonry backup.
 - 7. Section 07 65 00 - Flexible Flashing: for flexible flashing components integrating with transition materials specified in this Section.
 - 8. Section 07 92 00 - Joint Sealants: for backing materials.
 - 9. Division 07 roofing Sections for roof assembly air barriers and interface coordination.
 - 10. Section 09 21 16 - Gypsum Board Assemblies: for wall sheathing requirements for portions of the Work not requiring board product air barriers specified in this Section.

1.2 DEFINITIONS

- A. Air barrier Accessory: A transitional component of the air barrier that provides continuity.
- B. Air barrier Assembly: The collection of ABs and accessories applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.
- C. Air barrier Material (AB): Air tight barrier made of material that is relatively air impermeable but moisture vapor permeable, with sealed joints and penetrations, and with terminations sealed to adjacent surfaces.
- D. Material Transitions: Areas where the WRB/AB fiberglass-mat gypsum sheathing connects to beams, columns, slabs, parapets, foundation walls, roofing systems, and at the interface of dissimilar materials.
- E. Rough Openings: Openings in the wall to accommodate windows and doors.
- F. Water-Resistive Barrier (WRB): Water-shedding barrier made of material that is moisture-resistant, and installed to shed water, with sealed joints and penetrations, and with terminations sealed to adjacent surfaces.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate installation of board product air barriers with framing installation and subsequent operations that impact finished envelope air barrier work.
 - 2. Coordinate installation of joint sealants with cleaning of joint sealant substrates and other operations that may impact installation or finished joint sealant work.
- B. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review board product air barrier accessory materials installation, including joints between sheathing boards and transitions to abutting construction including air barriers work of other Sections. Review requirements for forming and sealing penetrations of air barrier by other trades.
 - 2. Review requirements for each type of air barrier product and installation, project and manufacturer's details, mockups, testing and inspection requirements, and coordination and sequencing of air barrier work with work of other Sections.

3. Review manufacturer's written instructions for meeting Project requirements for substrates specified, including three-dimensional video model demonstrating proper application of components at wall openings.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of air barrier product assembly and accessory. Indicate assembly component materials and dimensions and include construction and application details.
 1. Include data for framing preparation instructions and recommendations.
 2. Include data for substrate preparation instructions and recommendations.
 3. Include data for air- and water-resistive sheathing board assembly product data.
 4. Include standard drawings illustrating manufacturer's written installation and finishing instructions applicable to Project, including details for joints, counterflashings, penetrations, terminations, and tie-ins to adjacent construction.
- B. Shop Drawings: For locations and extent of WRB/AB system.
 1. Include details of typical conditions, special joint conditions, and intersections with other building envelope systems and materials.
 2. Include counter flashings and details showing bridging of envelope at substrate changes.
 3. Detail sealing penetrations, and flashing around windows and doors.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, testing agency, and manufacturer.
- B. Manufacturer Product Certificates: Indicate compliance with requirements of specified products under Performance Requirements or indicated on Drawings.
- C. Fire-Propagation Characteristics Certificate: From a qualified testing agency, documentation that air barrier system as a component of a wall assembly has been tested or engineered to pass NFPA 285. Include system classification number of testing agency on Shop Drawings.
- D. Product Certificates: Indicate compliance with requirements of specified products in "Performance Requirements" Article or as indicated on Drawings.
- E. Product Test Reports: For each air barrier product, and air- and water-resistive sheathing board assembly, for tests performed by a qualified testing agency.
- F. Sample Warranties: For manufacturer's warranties.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified air barrier manufacturer experienced in manufacture of air barrier as one of its principal products.
- B. Installer Qualifications: An experienced entity that employs applicators trained in application of specified products.
- C. Testing Agency Qualifications: Qualified independent agency experienced in installing specified waterproofing system, and qualified to perform observation and inspection specified in "Field Quality Control" Article to determine Installer's compliance with the requirements of this Project. Testing agency to be acceptable to Architect and retained by the Owner.
- D. Mockups: Provide air barrier mockup application within mockups required in other Sections, or if not specified, in an area of not less than 64 sq. ft. of wall surface where directed by Architect for each type of backup wall construction. Include examples of surface preparation, crack and joint treatment, air barrier application, and flashing, transition and termination conditions. Build mockups to set quality standards for materials and execution.
 1. Include air barrier system tie-in details between walls and roof, and with wall and foundation wall. Include penetrations and openings.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original, unopened packaging and store in an enclosed shelter providing protection from damage and exposure to the elements.
 - 1. Store within temperature limits required by manufacturer.
 - 2. Store air- and water-resistive sheathing board supported on risers on a flat platform.
 - 3. Comply with manufacturer's written instructions requirements for safety and handling.
- B. Discard liquid materials that cannot be applied within their stated shelf life.
- C. Store accessory materials in a location with constant ambient temperatures of 40 to 80 deg F.

1.8 FIELD CONDITIONS

- A. Cold Weather Conditions:
 - 1. Site Fluid-Applied, Vapor-Permeable Joint Flashing: Comply with manufacturer's cold weather application written instructions when atmospheric temperatures or substrate surface temperatures are less than 40 deg F.
 - 2. Accessories and Sealants: Comply with manufacturer's cold weather application instructions when atmospheric temperatures or substrate surface temperatures are less than 40 deg F.
- B. Exposure: Comply with manufacturer's limitations on exposure of applied product.
 - 1. Do not apply air barrier joint flashing to sheathing surface that is frozen or has frost.
- C. Protect adjacent substrates from environmental conditions that affect air barrier performance
- D. Coordinate installation of membrane air barrier with completion of roofing, below grade, factory fluid-applied membrane portion to site fluid-applied membrane portion and other work requiring interface with air barrier.
- E. Schedule work for inspection of air barrier applications prior to concealment.
- F. Ensure ABs are cured before covering with other materials.

1.9 WARRANTY

- A. Manufacturer's Warranty for Air Barrier System:
 - 1. Warranty Period for Air- and Water-Resistive Sheathing Board Assembly: Watertight for a period of ten years from date of Substantial Completion.
- B. Manufacturer's Warranty for Site Fluid-Applied Air Barrier Products: Manufacturer agrees to furnish and install AB to repair or replace those materials installed according to manufacturer's written instructions that exhibit material defects or otherwise fail to perform as a water-resistive barrier and air barrier, as defined in the applicable IBC and IECC, under normal use within specified warranty period.
 - 1. Manufacturer will, at its option, replace nonconforming Product or refund the purchase price of quantity of product shown to be nonconforming.
 - 2. Access for Repair: Provide air barrier system manufacturer with unimpeded pre- and post-occupancy access to Project facility and air barrier system for purposes of testing, leak investigation, and repair, and to reinstall removed cladding materials upon completion of repair.
 - 3. Warranty Period: Ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Source Limitations: Obtain fluid-applied flashing materials and air barrier accessories from single source from single manufacturer.
- B. Low-Emitting Materials: Fluid-applied flashing and accessories shall comply with testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

2.2 PERFORMANCE REQUIREMENTS

- A. Air- and Water-Resistive Performance: Air- and water-resistive board assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier system and as a water resistive barrier flashed to direct incidental water to wall exterior, and interface with adjacent building air barrier system components.
 - 1. Air- and Water-Resistive Board Assemblies: Capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations and transitions at perimeter conditions without deterioration and air-leakage exceeding specified limits.
- B. Air Permeance of Sheathing: Maximum 0.04 cfm/sq. ft of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E 2178.
- C. Air- and Water-Resistive Board Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E 2357.
- D. Water Penetration under Static Pressure: Test according to ASTM E 331, as follows:
 - 1. No evidence of water penetration through air barrier board assembly when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 2.86 lbf/sq. ft.
- E. Water Vapor Permeance; Panel Assembly: Minimum 10 perms (580 ng/Pa x s x sq. m) as tested according to ASTM E 96/E 96M, Procedure B.
- F. 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 a qualified testing agency.
- G. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
- H. Fire Propagation Characteristics: Provide air- and water-resistive board assembly qualified as a component of a comparable wall assembly that has been tested or engineered to pass NFPA 285.

2.3 WALL SHEATHING

- A. Air- and Water-Resistive Sheathing Board: ASTM C 1177/C 1177M, glass-mat-faced gypsum sheathing board.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide DensElement™ Barrier System as manufactured by Georgia-Pacific Gypsum LLC.; or a comparable product by one of the following:
 - USG Corporation and Tremco; Securock ExoAir 430 System.NO SUBSTITUTIONS.
 - 2. Board Thickness: 5/8 inch thick.
 - 3. Board Type: Type X.
 - 4. Board Size: 48 by 96 inches for vertical and horizontal installations.
 - 5. Air- and water-resistive Flashing Thickness: Minimum 16 mils wet film thickness.
 - 6. Physical and Performance Properties:
 - a. Air Permeance; ASTM E 2178: Maximum 0.04 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference.
 - b. Water Vapor Permeance: Minimum 10 perms (580 ng/Pa x s x sq. m) when tested according to ASTM E 96/E 96M, Procedure B.
 - c. Combustion Characteristics; ASTM E 84: Class A.
 - d. Board Product Antifungal Properties; ASTM D 3273: 10; zero defacement.
 - e. VOC Content - Fluid-Applied Flashing: 50 g/L or less.
 - f. UV and Weathering Resistance: Maximum 12-month exposure.

2.4 AIR BARRIER ACCESSORY MATERIALS

- A. General: Provide compatible air barrier accessory materials furnished or recommended by air barrier manufacturer as required by Project conditions to produce a complete air barrier assembly identical to tested assemblies meeting performance requirements.

- B. Joint Backing: See SECTION 07 92 00 - JOINT SEALANTS for backing materials.
- C. Primer: Liquid primer recommended by air barrier manufacturer for exposed gypsum core edges.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide PROSOCO, Inc.; PorousPrep Sealer.
 - 2. Color: Blue.
- D. Fluid-Applied Air Barrier Flashing: Site-applied for application to joints, fasteners, penetrations, openings and material transitions.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide DensDefy Liquid Flashing as manufactured by Georgia Pacific Gypsum LLC.
 - 2. Color: Gold
- E. Flashing and Transition Strip: Self-adhered membrane, 25 mils thick.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide DensDefy Transition Membrane as manufactured by Georgia Pacific.

2.5 FASTENERS

- A. Screws for Fastening Board Product Air barriers to Cold-Formed Metal Framing: Steel drill screws, ASTM C 1002, in length recommended by sheathing manufacturer for sheathing thickness.
- B. Screws for Fastening Board Product Air Barriers to Wood Framing: Wood screws, ASTM C 1002, in length in accordance with sheathing manufacturer's written instructions for sheathing thickness

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Framing Examination: Examine framing to determine if work is ready to receive board product air barriers.
 - 1. Verify that surface flatness tolerances and framing spacing comply with Project requirements.
 - 2. Verify that adequate support is provided for sheathing board edges.
 - 3. Proceed with work once conditions comply with manufacturer's written instructions.
- B. Adjacent Substrate Examination: Prior to installation of accessory materials, examine adjacent substrates to receive transition treatment.
 - 1. Verify that substrates are sound and free of contaminants, adequately cured or aged, compatible with proposed transition materials, and free of obstructions or impediments that would result in failure of transition adhesion and failure of air barrier assembly to perform according to Project requirements.
 - 2. Verify that concrete and masonry surfaces are visibly dry, cured, and free from release agents, curing agents, and other contaminates.
 - a. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
 - 3. Verify that masonry joints are filled with mortar and struck flush.
- C. Proceed with installation once conditions comply with manufacturer's written instructions and only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean, prepare, and treat portions of work not requiring sheathing board substrate according to air barrier manufacturer's written instructions.
 - 1. Mask adjacent finished surfaces.
 - 2. Remove contaminants and film-forming coatings from substrates.
 - 3. Remove projections and excess materials; fill voids with substrate patching material.
 - 4. Prepare and treat joints and cracks in substrate according to air barrier manufacturer's written instructions.
- B. Joints:
 - 1. Seal all sheathing joints with fluid-applied flashing approved by sheathing manufacturer.
 - 2. Fill gaps from 1/8 to 1/4 inch with a backer rod prior to applying fluid-applied flashing.
 - 3. Seal gaps greater than 1/4 inch with transition membrane and fluid-applied flashing approved by sheathing manufacturer.

3.3 INSTALLATION OF AIR- AND WATER-RESISTIVE SHEATHING BOARDS

- A. Discard each air- and water-resistive sheathing board with damage that compromises continuity or impairs performance as an air barrier, and is unable to be repaired according to manufacturer's written repair instructions.
 - 1. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Comply with ASTM C 1280, GA-253, and manufacturer's written instructions.
 - 1. Fasten sheathing boards to cold-formed metal framing with specified screws in pattern indicated.
 - 2. Install sheathing boards with a 1/4-inch gap where they abut masonry or similar materials that might retain and transmit moisture to them.
- C. Cut sheathing boards at penetrations, edges, and other obstructions of work to allow for application of air barrier accessory materials. Fit sheathing boards closely against abutting construction.
- D. Install sheathing boards with long dimension perpendicular or parallel to framing. Abut ends and edges of sheathing boards centered over face of framing members. Offset sheathing boards joints by not less than one stud spacing.
 - 1. Apply sheathing boards in pieces sized to provide minimum number of joints and optimum sheathing board arrangement. Arrange joints so that pieces do not span between fewer than three support members.
 - 2. Do not bridge building expansion joints; cut and space edges of sheathing boards to match spacing of structural support elements.
- E. Space fasteners maximum 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of sheathing boards and as required in indicated fire-resistance-rated designs.
 - 1. Apply fasteners so heads are seated flush to board product air barrier membrane surface without breaking or punching through the surface.
 - a. Treat all fasteners with specified fluid-applied flashing used for sealing joints.
 - b. Misplaced fasteners shall be left in place and treated. If fasteners must be removed, patch and treat resulting hole per system manufacturer's written instructions.
 - 2. Securely attach sheathing boards to substrate by fastening as indicated, complying with the following:
 - a. Table 2304.9.1, "Fastening Schedule," in the IBC.
 - b. ICC-ES evaluation report for fastener.
 - 3. Use corrosion resistant sheet metal screw fasteners. 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.
- F. Coordinate wall sheathing boards installation with flashing and air barrier accessory material installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

3.4 INSTALLATION OF SITE FLUID-APPLIED AIR BARRIER FLASHING

- A. General: Apply site fluid-applied AB at joints, fasteners, penetrations, openings, and material transitions to achieve a continuous air barrier according to air barrier manufacturer's written instructions. Apply site fluid-applied AB within manufacturer's recommended application temperature ranges.
- B. Apply self-adhered flashing material in full contact with substrate to produce a continuous seal according to air barrier manufacturers written instructions.
 - 1. Vapor-Permeable Air barrier: Total wet film thickness as recommended in writing by manufacturer to meet performance requirements, but not less than 16 mils wet film thickness, applied in one or more equal coats by roller, spray, trowel, or knife.
- C. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.
- D. Do not cover air barrier until it has been inspected and approved by the Authority Having Jurisdiction for compliance with the applicable IBC and IECC. Components and systems subject to inspections include, but are not necessarily limited to, the following:
 - 1. Inspections at framing and rough-in shall be made before application of exterior and interior finishes and shall verify compliance with the code as to air leakage controls.

- E. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air barrier components.

3.5 INSTALLATION OF AIR BARRIER ACCESSORY MATERIALS

- A. General: Install accessory materials according to air barrier manufacturer's written instructions and AAMA 714. Install AB to adjacent components of building air barrier system, including, but not limited to, roofing system air barrier, exterior fenestration systems, door framing, and other openings.
- B. Apply primer according to manufacturer's written installation instructions.
- C. Seal punctures, voids, and seams. Patch with fluid-applied flashing extending 6 inches beyond repaired areas.
- D. Seal wall penetrations according to manufacturer's written installation instructions and recommendations.
- E. Connect and seal exterior wall air barrier continuously to subsequently-installed roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- F. Rough Openings: Apply bead of fluid-applied flashing to inside corners first, followed by application to jambs, header, sill, and adjacent sheathing.
- G. Flashings: Seal top of through-wall flashings to air barrier with fluid-applied flashing.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections.
 - 1. Inspections: ABs, accessories, and installation are subject to inspection for compliance with requirements and photograph documentation of conditions to be concealed by subsequent Work.
- B. Tests: As determined by Owner's testing agency from among the following tests:
 - 1. Qualitative Air-Leakage Testing: Test air barrier assemblies for air leakage according to ASTM E 1186, smoke pencil with pressurization or depressurization or ASTM E 1186, chamber pressurization or depressurization with smoke tracers.
 - 2. Quantitative Air-Leakage Testing: Test air barrier assemblies for air leakage according to ASTM E 783.
 - 3. Testing: See related specification section requirements for additional testing and inspection requirements.
- C. Air- and water-resistive sheathing board will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

3.7 CLEANING AND PROTECTING

- A. Clean spills, stains, and overspray resulting application using cleaning agents recommended by manufacturers of affected construction. Remove masking materials.
- B. Protect air barrier from damage from subsequent work. Protect materials from exposure to UV light for period in excess of that acceptable to air barrier manufacturer; replace overexposed materials and retest.

END OF SECTION

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SECTION 07 11 13

BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Concealed mastic dampproofing in masonry walls. Refer to schedule at end of section.
- B. Related Requirements:
 - 1. Section 04 20 00 - Masonry Units.
 - 2. Section 06 16 56 - Air- and Water-Resistive Sheathing Board System
 - 3. Section 07 13 26 - Self-adhering Sheet Waterproofing.
 - 4. Section 07 14 00 - Fluid-applied Waterproofing.
 - 5. Section 07 27 26 - Fluid-Applied Membrane Air Barriers
 - 6. Section 07 65 00 - Flexible Flashing

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 – SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data: Indicate properties of products, performance characteristics, proposed use, and certifications that product meets or exceeds standards.
- C. Manufacturer's Instructions: Including application instructions, precautions, material safety, and methods of attachment/embedment into substrate data sheets.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Waterproofing Manual, and manufacturer's instructions, whichever are more stringent.
- B. For interior and concealed in all applications, provide product certified by manufacturer to be substantially odor-free within 24 hours of application.

1.4 QUALIFICATIONS

- A. Applicator Qualifications: Company experienced in application of dampproofing with 3-years experience on similar sized projects.

1.5 FIELD SAMPLES

- A. Provide 4 x 6 foot field sample of mastic dampproofing under provisions of SECTION 01 45 00 - QUALITY CONTROL illustrating application techniques and material thickness.
- B. Sample may be incorporated as part of work if approved in writing by Architect.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, handle and protect under provisions of SECTION 01 65 00 - PRODUCT DELIVERY REQUIREMENTS and SECTION 01 66 00 - PRODUCT STORAGE AND HANDLING PROTECTION.
- B. Do not allow products to become frozen.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient and surface temperature above 40°F. for 24 hours before application and continuously until mastic dampproofing has cured.

- B. Do not allow dampproofed surfaces to be exposed to prolonged sunlight.

1.8 SEQUENCING AND SCHEDULING

- A. Coordinate installation in accordance with SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION. Do not begin work until substrate preparation is complete.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Mastic: ASTM D 1227, Type II, Class 1, semi-mastic asphaltic emulsion reinforced with non-asbestos fibers. Product/manufacturer; one of the following:
 - 920AF Fibered Emulsion Mastic; Karnak
 - Sealmastic; W.R. Meadows, Inc.
 - Sikalastic 315 (formerly MasterSeal 615); Sika.
- B. Substitutions: Submit in accordance with SECTION 01 62 00 - PRODUCT OPTIONS.

2.2 ACCESSORIES

- A. Mastic Dampproofing:
 - 1. Emulsion Based Dampproofing: Non-asbestos fiber reinforced emulsion asphaltic compound, brush or spray consistency, meeting requirements of ASTM D 1227 or FS-4-1781.
 - 2. Reinforcing Mesh; Treated glass fabric, woven design, 20 x 10 mesh.
 - 3. Plastic Cement: Type recommended by manufacturer and compatible with dampproofing product, for trowel consistency.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Verify that surfaces and conditions are ready to receive work of this section. Notify Architect of any existing conditions which will adversely affect execution. Beginning of execution will constitute acceptance of existing conditions.
- B. Do not apply when surface of ambient temperature is below 40°F., during inclement weather, or if surface is damp, dirty, or dusty.
- C. Verify surfaces are solid and free of cracks, pits, rough or sharp projections.
- D. Verify items which penetrate surface to receive dampproofing are securely anchored.

3.2 PREPARATION

- A. Remove rough or sharp projections, loose particles, and foreign matter detrimental to adhesion and application of dampproofing.
- B. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's written instructions.
- C. Apply two coats of plastic cement and one layer of reinforcing mesh (between plastic cement coats) to seal penetrations, small cracks, and at other areas as recommended by manufacturer.
- D. Fill voids, seal joints, and apply bond breakers, if any, as recommended by prime materials manufacturer, with particular attention at control joints.

3.3 INSTALLATION

- A. Mastic Dampproofing: For application over concealed masonry, and concrete surfaces within walls.
 - 1. Clean surfaces of excess mortar and loose dirt and apply the mastic in two coats by brush or spray. Allow the first coat to dry tacky before applying the second coat.

2. Coverage shall be approximately 35 sq.ft. per gallon per coat. Fill in crevices and grooves and around projecting anchors and joint reinforcement. Make sure that coating is continuous and free from breaks and pinholes.
3. At glass-mat gypsum sheathing, apply dampproofing prior to installation of masonry anchors.

3.4 FIELD QUALITY CONTROL

- A. Tests: Periodically (not less than once per 100 sq.ft. of surface area) check application thickness to verify compliance with specified thickness. Immediately re-apply if found to be deficient.

3.5 PROTECTION

- A. Protect finished installation under provisions of SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS.
- B. Protect adjacent surfaces not to receive dampproofing against "overspray" or "over brush".
- C. Protect dampproofing against damage during backfilling with adhered protection course, neatly fitted around projections and penetrations. Do not apply until dampproofing has thoroughly cured.
- D. Protect flashing until placement within wall is complete. Do not allow wind to displace or damage flashing.

3.6 CLEANING

- A. Perform final cleaning under provisions of SECTION 01 74 13 - PROGRESS CLEANING.

3.7 DAMPPROOFING SCHEDULE

- A. Dampproof as follows with mastic:
 1. Over the exterior surfaces of the inside wythe of masonry and concrete backup in below-grade exterior cavity walls to provide an unbroken dampproofing barrier.
 2. Over the inside wythe of masonry and concrete backup in non-conditioned buildings or dumpster walls.
 3. Elsewhere where indicated.

END OF SECTION

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SECTION 07 14 00

FLUID-APPLIED WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Fluid applied elastomeric waterproofing:
 - 1. Horizontal waterproofing membrane over concrete floor slabs.
 - 2. Vertical waterproofing below-grade.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete.
 - 2. Section 32 05 19 - Geotextiles for Exterior Improvements.

1.2 SUBMITTALS

- A. Product Data: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. Include membrane thickness, accessories, and method of application.

1.3 QUALITY ASSURANCE

- A. Applicator Qualifications: This work shall be performed by an experienced applicator who has successfully applied the materials and used the methods specified under similar conditions over a period of at least five years.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in the original, sealed containers or unopened packages clearly labeled with the manufacturer's name and the contents.
- B. Store materials in a heated and ventilated area located away from all sources of sparks and open flame. Containers of liquid material shall not be left open at any time in the storage area.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Elastomeric Waterproofing: Provide a one-component, moisture-curing, bitumen-modified polyurethane elastomeric waterproofing membrane, containing no coal tar extenders. Provide formulation appropriate for chosen horizontal or vertical installation with associated trowel, squeegee, roller or spray application. Product/manufacture; one of the following:
 - MasterSeal HLM 5000; Master Builders Solutions, a brand of MBCC Group.
 - MiraSEAL; Carlisle Coatings & Waterproofing Incorporated (CCW)
- B. Flashing Membrane: Provide 1/16" thick neoprene synthetic rubber sheet.
- C. Adhesive: Provide neoprene adhesive manufactured expressly for use with the synthetic rubber flashing membrane.
- D. Drainage Mat: Reference SECTION 32 05 19 - GEOTEXTILES FOR EXTERIOR IMPROVEMENTS.
- E. Protection Board: Provide a semi-rigid, asphalt saturated board 1/8" thick. Product/manufacture: Type PC-2 Protection Course; W.R. Meadows.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Remove loose dirt and debris and clean off oil, grease, paint and other foreign contaminants to leave the concrete surface clean and dry. Immediately prior to and during application, remove dirt and dust from the surface with compressed air or a soft broom. Mask with paper and tape the surfaces not designated to receive waterproofing to protect them from accidental application of the waterproofing material.

3.2 INSTALLATION

- A. Applying Waterproofing:
 - 1. Select the grade of product that best meets the individual job requirements.
 - 2. Mix the waterproofing compound thoroughly in conformance with the manufacturer's printed instructions.
 - 3. Horizontal Application: Apply product over horizontal surface in one coat using a roller, trowel, or squeegee as required to obtain thickness required. Pour the mixed compound onto the concrete floor and spread out with trowel and squeegee to a thickness of not less than 1/16". Coverage shall be not less than 4 gallons per square.
 - 4. Vertical Application: Apply one coat using a roller, trowel, or squeegee as required to obtain thickness required. Wait for material to film form and become stable between each coat.
 - 5. Install flashing membrane along perimeter walls. Install with adhesive applied to the concrete surface and to the back of the membrane. Press firmly into place without stretching and work out all bubbles, wrinkles and fishmouths. At walls in horizontal application, turn membrane up approximately 3" above the waterproofed surface to form a dam. Lap joints 3" and bond with adhesive.
 - 6. Over flashing membrane, apply a thin coat of neoprene adhesive and allow to dry until tacky before covering with the waterproofing compound. On metal pipes and conduits projecting through the concrete, apply a second coat of waterproofing compound after the first coat has cured. Extend the waterproofing into the floor drain flashing rings.
 - 7. For at least 24 hours after completion of the waterproofing, keep the area clear of all traffic. After testing for leaks, cover the waterproofing with protection board laid with close butt joints and cut to fit around projections and at offsets.

3.3 FIELD QUALITY CONTROL

- A. Testing: Floor areas protected with elastomeric waterproofing shall be flood tested for leaks prior to installing the protection board. Plug the floor drains and flood the areas with water to a depth of 2" or more. Allow the water to stand for 24 hours before draining off. Repair all leaks.

END OF SECTION

SECTION 07 18 13

PEDESTRIAN TRAFFIC COATING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Interior pedestrian traffic coating system.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete.

1.2 SUBMITTALS

- A. Product Data: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. Include a printed sample of the joint guarantee to be furnished with the accepted coating system.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of traffic coatings required for this Project.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels showing the following information:
 - 1. Manufacturer's brand name.
 - 2. Type of material.
 - 3. Directions for storage.
 - 4. Date of manufacture and shelf life.
 - 5. Lot or batch number.
 - 6. Mixing and application instructions.
 - 7. Color.
- B. Store materials in a clean, dry location protected from exposure to direct sunlight. In storage areas, maintain environmental conditions within range recommended in writing by manufacturer.

1.5 PROJECT CONDITIONS

- A. Environmental Limitations: Apply traffic coatings within the range of ambient and substrate temperatures recommended in writing by manufacturer. Do not apply traffic coatings to damp or wet substrates, when temperatures are below 40°F., when relative humidity exceeds 85 percent, or when temperatures are less than 5°F. above dew point.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which traffic coating manufacturer agrees to repair or replace traffic coatings that deteriorate within five years from date of substantial completion.
 - 1. Deterioration of traffic coatings includes the following:
 - a. Adhesive or cohesive failures.
 - b. Abrasion or tearing failures.
 - c. Surface crazing or spalling.
 - d. Intrusion of water, oils, gasoline, grease, salt, deicer chemicals, or acids into deck substrate.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Traffic Coatings: Complying with ASTM C 957.

- B. Material Compatibility: Provide primers, base, intermediate, and topcoats; and miscellaneous materials that are compatible with one another and with substrate under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.2 PEDESTRIAN TRAFFIC COATING

- A. Product/manufacturer: Subject to compliance with requirements, provide one of the following:
Sikalastic Pedestrian Traffic 1500 (M200/TC225 HT); Sika (Formerly MasterSeal Traffic 1500).
Pecora Deck 802/804/806 System; Pecora Corporation (Carlisle CCW System)
Peda-Gard; Neogard, Division of Hempel
- B. Primer: Manufacturer's standard factory-formulated urethane primer recommended for substrate and conditions indicated.
- C. Preparatory and Base Coats: Single- or multi-component, aromatic liquid urethane elastomer.
- D. Topcoat: Single- or multi-component, aliphatic liquid urethane elastomer. Color shall be Gray.
- E. Aggregate: Uniformly graded, washed silica sand of particle sizes, shape, and minimum hardness recommended in writing by traffic coating manufacturer. Spreading rate as recommended by manufacturer for substrate and service conditions indicated, but not less than 8 to 10 lb./100 sq. ft.

2.3 MISCELLANEOUS MATERIALS

- A. Joint Sealants: Low modulus unmodified polyurethane based.
- B. Adhesive: Contact adhesive recommended in writing by traffic coating manufacturer.
- C. Reinforcing Strip: Fiberglass mesh recommended in writing by traffic coating manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements and for other conditions affecting performance of traffic coatings.
- B. Begin coating application only after minimum concrete curing and drying period recommended by traffic coating manufacturer has passed, after unsatisfactory conditions have been corrected, and after surfaces are dry.
- C. Verify that substrates are visibly dry and free of moisture. Test for moisture vapor transmission by plastic sheet method according to ASTM D 4263.
- D. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Clean and prepare substrates according to ASTM C 1127 and manufacturer's written recommendations to produce clean, dust-free, dry substrate for traffic coating application.
- B. Mask adjoining surfaces not receiving traffic coatings, deck drains, and other deck substrate penetrations to prevent spillage, leaking, and migration of coatings.
- C. Concrete Substrates: Mechanically abrade concrete surfaces to a uniform profile according to ASTM D 4259. Do not acid etch.
 - 1. Remove grease, oil, paints, and other penetrating contaminants from concrete.
 - 2. Remove concrete fins, ridges, and other projections.
 - 3. Remove laitance, glaze, efflorescence, curing compounds, concrete hardeners, form-release agents, and other incompatible materials that might affect coating adhesion.
 - 4. Remove remaining loose material to provide a clean, sound surface.

3.3 TERMINATIONS AND PENETRATIONS

- A. Prepare vertical and horizontal surfaces at terminations and penetrations through traffic coatings and at drains and sleeves according manufacturer's written recommendations.
- B. Provide sealant cants at penetrations and at reinforced and nonreinforced, deck-to-wall butt joints.

3.4 JOINT AND CRACK TREATMENT

- A. Prepare, treat, rout, and fill joints and cracks in substrates according to manufacturer's written recommendations. Before coating surfaces, remove dust and dirt from joints and cracks.

3.5 TRAFFIC COATING APPLICATION

- A. Apply traffic coating material according to ASTM C 1127 and manufacturer's written recommendations.
- B. Apply traffic coatings to prepared wall terminations and vertical surfaces to height indicated, and omit aggregate on vertical surfaces.
- C. Cure traffic coatings according to manufacturer's written recommendations. Prevent contamination and damage during application and curing stages.

3.6 PROTECTING AND CLEANING

- A. Protect traffic coatings from damage and wear during remainder of construction period.
- B. Clean spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

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SECTION 07 19 00

WATER REPELLENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Clear water repellent coating applied to exterior vertical and sloping concrete and masonry (brick and cast stone) surfaces.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-in-place Concrete: cleaning of concrete surfaces.
 - 2. Section 04 20 00 - Masonry Units: cleaning of masonry surfaces.
 - 3. Section 09 91 00 - Painting: painting of exterior concrete masonry units.

1.2 SUBMITTALS

- A. Product Data: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. Include manufacturer's installation instructions.
- B. Samples: 12" x 24" sample of substrate with half of sample having been treated with coating and the other half bare.
- C. Manufacturer's Instructions: Installation instructions, including application rates, methods and techniques.

1.3 QUALITY ASSURANCE

- A. Applicator Qualifications: Work shall be performed by an experienced applicator who has not less than five years experience and has successfully applied this material under similar conditions.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver material in the original, sealed containers clearly labeled with the manufacturer's name and the contents. Store material in a well-ventilated area.

1.5 FIELD SAMPLE

- A. Apply coating to approximately a 100 sq. ft. area of substrate material for Architect's approval.
- B. Verify that substrate has received a sufficient amount of coating to perform as intended and that product is not staining or discoloring surface.
- C. When approved, field sample may remain as part of the work.

1.6 PROJECT CONDITIONS

- A. Do not apply coating when ambient or substrate temperatures are lower than 40°F. or higher than 100°F.
- B. Do not apply during inclement weather or when forecasted conditions will not permit work in accordance with manufacturer's printed instructions.
- C. Do not apply during windy conditions that may cause water repellent to be blown onto vegetation or surfaces not intended to be coated.
- D. Provide mechanical ventilation during and after application to dissipate fumes if natural ventilation is insufficient.

1.7 WARRANTY

- A. Warranty: Submit a written warranty, executed by the applicator and water repellent manufacturer, covering materials and labor, agreeing to repair or replace materials that fail to provide water repellency within 5 years from date of substantial completion.

1.8 EXTRA MATERIALS

- A. Furnish under provisions of SECTION 01 78 40 - SPARE PARTS, OVERAGES, AND MAINTENANCE MATERIALS.
- B. Provide two gallons of coating.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Provide a colorless water and stain repellent coating for **[concrete and]** masonry. Coating shall be clear, liquid, penetrating, solvent based, non-yellowing, non-staining, breathable acrylic solution, have a minimum solids of 5% as determined by ASTM D 2369 testing, and meeting requirement of FF-SS-110C. Product/manufacturer; one of the following:
 - Prime-A-Pell 200; Chemprobe Coating Systems, A Division of Tnemec Co., Inc.
 - Euco-Guard 200; Euclid ChemicalCo.
 - Klere-Seal 908-SX; Pecora Corp.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and conditions are ready to receive work of this section. Notify Architect of any existing conditions which will adversely affect execution. Beginning of execution will constitute acceptance of existing conditions.
- B. Verify that surfaces are clean, dry, sound, properly covered, dust free, free of efflorescence, oil or other matter detrimental to coating application.
- C. Verify that joint sealant work is complete and sealant has properly cured.
- D. Verify that cracks in concrete larger than 1/64" in width have been filled with patching compound acceptable to coating manufacturer.

3.2 PREPARATION

- A. Examine surfaces to be treated for loose dirt and debris, stains, chemical films, oil, grease, paint and other foreign contaminants. Surfaces shall be clean and dry prior to application. Immediately prior to and during application, remove any dust and dirt from surfaces.
- B. Allow surfaces to dry sufficiently after washing in accordance with manufacturer's directions.
- C. Protect adjacent surfaces from overspray or drift.
- D. Protect landscaping, adjacent property, and vehicles.
- E. Comply with manufacturer's written instructions.

3.3 INSTALLATION

- A. Apply using skilled workmen in accordance with manufacturer's printed instructions and recommendations.

- B. Apply the coating to dry surfaces using a standard metal tank sprayer or painting apparatus such that the treatment totally wets the surface. Apply evenly, being careful to avoid excessive run down. Avoid misting of the spray as the treatment is applied. Protect shrubs and painted surfaces during application. Allow coating to cure.
- C. Do not dilute or alter material as packaged.

3.4 CLEANING

- A. Take care to avoid spraying coating on adjacent materials. Any such soiling shall be carefully and completely cleaned using a suitable solvent.
- B. After application on glazed brick and mortar, wipe down brick only to remove any extra coating residue retained on the brick.

END OF SECTION

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SECTION 07 21 00

BUILDING INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Thermal, acoustical, and fire safing building insulations.
- B. Related Sections:
 - 1. Section 04 20 00 - Masonry Units.
 - 2. Section 06 16 56 - Air- and Water-Resistive Sheathing Board System
 - 3. Section 07 21 19 - Foamed-in-Place Insulation
 - 4. Section 07 27 26 - Fluid-Applied Membrane Air Barriers
 - 5. Section 07 65 00 - Flexible Flashing
 - 6. Section 07 84 00 - Firestopping.

1.2 SUBMITTALS

- A. General: Submit following items under provisions of SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data: Including performance specifications, composition and applicable standards.
- C. Samples: Submit 12" x 12" size samples of each type insulation proposed for use.
- D. Manufacturer's Instructions: Written installation instructions, including attachment recommendations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers: (See Articles below for specific products)
 - CertainTeed Architectural
 - Dow Chemical Company
 - Johns Manville, A Berkshire Hathaway Co., Denver, CO
 - Knauf Insulation
 - Owens Corning, Toledo, OH
 - Rockwool
 - Thermafiber, Inc. (Owens Corning)
 - U.S. Gypsum Co.

2.2 BATT THERMAL INSULATION

- A. Glass fiber composition, unfaced, minimum one lb./c.f. density, meeting following standards:
 - 1. ASTM E 84: FHC 25/50 maximum.
 - 2. ASTM C 518: R value of 3.2 per inch of thickness.
 - 3. ASTM C 665: Type I and Type III, Class A.
- B. Following products are acceptable:
 - 1. Unfaced Thermal Batts by Owens Corning Fiberglas Corp.
 - 2. Unfaced Building Insulation by CertainTeed Architectural
 - 3. Unfaced Building Insulation by Johns Manville Corp.
 - 4. Unfaced EcoBatt Insulation by Knauf Insulation

2.3 MINERAL-WOOL BLANKET INSULATION

- A. Mineral-Wool Blanket Insulation, Unfaced: ASTM C665, Type I (blankets without membrane facing); consisting of fibers; passing ASTM E136 for combustion characteristics.
 - 1. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
 - 2. Smoke-Developed Index: Not more than 50 when tested in accordance with ASTM E84.

3. Labeling: Provide identification of mark indicating R-value of each piece of insulation 12 inches and wider in width.

B. Following products are acceptable:

1. TempControl Mineral Wool Batts; Johns Manville Corp.
2. Thermafiber Ultrabatt Mineral Wool Insulation; Owens Corning
3. Comfortbatt; Rockwool

2.4 SEMI-RIGID INSULATION

A. Continuous Insulation Basis of Design: Provide Thermafiber RainBarrier Insulation as manufactured by Owens Corning.

1. Acceptable Products/Manufacturers:

JM CladStone 60 Water & Fire Block; Johns Manville
Thermafiber RainBarrier; Owens Corning
Cavityrock; Rockwool

2. Description: Non-combustible, semi-rigid mineral wool insulation board that is water repellent and meets ASTM C 612, IA and IB; passing ASTM E136 for combustion characteristics.

3. Thickness: As noted on contract drawings.

4. Paint flat black behind joints at open joint panel assemblies.

5. Type:

- a. R-value of min. 4.3 per inch.
- b. Facing: Unfaced.
- c. Density: 6.0 pcf.
- d. Surface Burning Characteristics: Unfaced-Flame Spread 0 and Smoke Developed 0
- e. Moisture Resistance: Absorbs less than 0.03% by volume, ASTM C 1104.
- f. Non-corrosive, ASTM C 665.
- g. Recycled Content for Standard Mineral Wool Products.....70%

2.5 BATT ACOUSTICAL INSULATION

A. Unfaced glass fiber composition, 3½" thick, minimum one lb./c.f. density, meeting following standards:

1. ASTM E 84: FHC 25/50 maximum.
2. ASTM C 518: R value of 3.2 per inch of thickness.
3. ASTM C 665: Type I, Class A.

B. Following products are acceptable

1. Sound Control Batts by CertainTeed Architectural
2. EcoTouch Sonobatts by Owens Corning Insulating Systems, LLC
3. Unfaced Building Insulation by Johns Manville Corp.
4. EcoBatt Insulation by Knauf Insulation

2.6 FIRE SAFING INSULATION

A. Mineral fiber composition, 4" thick, 4.0 pcf density, meeting following standards

1. ASTM E 84: FHC 15/10 maximum.
2. ASTM C 665: Type I, Class A
3. ASTM E 119: Testing Procedures.
4. FS HH-I-558B: Class 1 and 2.

B. Following products are acceptable

1. Thermafiber Safing Insulation by Owens Corning.
2. Mineral Wool Safing Insulation by Johns Manville.

2.7 RIGID INSULATION

A. Polyisocyanurate Board, Foil Faced: ASTM C 1289, foil faced, Type I, Class 1 or 2. Rigid board insulation consisting of a glass-fiber-reinforced polyisocyanurate foam core laminated between aluminum foil facers.

1. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.8 ACCESSORIES

A. Joint Tape: Pressure sensitive type, recommended by insulation manufacturer.

- B. Insulation Adhesive: Type recommended by insulation manufacturer.
 - 1.
- C. Stick Clips
 - 1. Galvanized sheet metal with impaling pins and retainer washers.
 - 2. Size and type to suit application and insulation thickness.
 - 3. Approved by manufacturer of insulation for intended use.
- D. Stick Clip Adhesive
 - 1. High strength, resilient adhesive, having drying time of 0 to 30 minutes (rapid initial set), and 24 hours final set.
 - 2. Compatible with insulation adhesive, insulation and substrate.
 - 3. Non-corrosive to galvanized steel.
- E. Supportive Wire Mesh: Hexagonal design, woven mesh "chicken wire" style.
- F. Tie wire: Minimum 18 ga. annealed wire.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine areas to receive insulation for conditions that will adversely affect the execution and quality of the work. Do not start this work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Fit insulation tight within stud spaces, above soffits, behind fascias, and tight to and behind mechanical and electric services within plane of insulation, leaving no gaps or voids. Butt insulation tightly. Cut and fit tightly around items penetrating insulation. Stagger and butt joints, or cavity of a cavity wall system.
- B. Install in conformance with the manufacturer's recommendations. Cut material to fit closely around obstructions and projections.
 - 1. Walls: Secure insulation by mechanical means to hold it in place without sagging or slumping. Install insulation with edges and joints butted tight to leave no gaps.
 - 2. Soffits: Insulation shall be laid between wire hangers on back of cement plaster and over cross runners. Sides and ends of adjacent batts shall be tightly butted together.
 - 3. Acoustical Insulation:
 - a. Install acoustical insulation between the studs in those gypsum drywall partitions so detailed and noted on the drawings. Staple blankets to the gypsum board or otherwise fasten in place as recommended by the manufacturer of the blankets. Fill all voids.
 - b. Where indicated at suspended gypsum board ceilings, lay sound attenuation blankets between wire hangers on back of gypsum board and over cross runners. Do not install on top of or within 3" of light fixtures.
- C. Applying Semi-Rigid Insulation: Install board insulation between the wythes in exterior masonry walls.
 - 1. In masonry walls place boards over the fluid-applied membrane air barrier on the face of the backup masonry before the face brick wythe is laid.
 - 2. Securely fasten the board to the backup with mastic and suitable mechanical anchors to hold it firmly in place.
 - 3. In framed construction, apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
 - 4. Cut the material to fit snugly around obstructions and projections. Joints shall be tight.
 - 5. Seal joints between units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.
- D. Safing Insulation: Compress and install insulation on wire hangers or clips in spaces between floor slabs and curtain walls. Also, in openings in floor slabs to seal around telephone cables, piping, ducts and other utilities per SECTION 07 84 00 - FIRESTOPPING.
- E. Curtain Wall Insulation: Install board insulation in curtain-wall construction according to curtain-wall manufacturer's written instructions.

1. Foil face shall face interior of building.
2. Hold insulation in place by securing metal clips and straps or integral pockets within window frames, spaced at intervals recommended in writing by insulation manufacturer to hold insulation securely in place without touching spandrel glass.
3. Maintain cavity width of dimension indicated on Drawings between insulation and glass.
4. Install insulation to fit snugly without bowing.

3.3 SCHEDULES

- A. Provide R values for thermal insulation as indicated on the drawings.
- B. Provide acoustical insulation in thickness and locations as follows:
 1. Walls: 3½" (or as shown on drawings)
 2. Above Ceilings: 3½" (or as shown on drawings)

END OF SECTION

SECTION 07 26 00

VAPOR RETARDERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Vapor retarder placed on soil surface.
- B. Related Sections:
 - 1. Section 03 11 00 - Concrete Forming and Accessories.
 - 2. Section 03 30 00 - Cast-in-Place Concrete.
 - 3. Section 07 62 00 - Sheet Metal Flashing and Trim: Vapor retarder at roof expansion joints.
 - 4. Section 31 31 00 - Soil Treatment: Temporary polyethylene sheeting over treated soil.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data:
 - 1. Provide product data for each type of product.
 - 2. Manufacturer's installation instructions for placement, seaming, penetration prevention and repair, and perimeter seal per ASTM E1643.
 - 3. Product Test Reports: For each product, for tests performed by a qualified testing agency.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Vapor Retarder: Product/manufacturer; one of the following:
 - Ecoshield-E; Epro Services
 - Stego Wrap (15 mil) Vapor Retarder; Stego Industries, LLC
 - Perminator (15 mil); W.R. Meadows
- 1. Vapor Retarder membrane shall have the following qualities:
 - a. Permeance of less than 0.01 Perms [grains/(ft²*hr*inHg)] as tested after mandatory conditioning tests ASTM E 154 (sections 8, 11, 12, 13) per ASTM F 1249 or ASTM E 96.
 - b. ASTM E 1745 Class A.
 - c. Minimum thickness 15 mils.
- 2. Accessories:
 - a. Seam Tape: High-density polyethylene tape with pressure sensitive adhesive. Minimum width 3.75 inches.
 - b. Pipe Boots (Penetrations of Vapor Retarder): Construct pipe boots from vapor retarder material and pressure sensitive tape per manufacturer's instructions.
 - c. Perimeter/edge seal: Provide the following as manufactured by Stego Industries LLC, (887) 464-7834 www.stegoindustries.com.
 - 1) Stego Crete Claw
 - 2) Stego Term Bar.
 - 3) StegoTack Double-Sided Tape.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Remove soil treatment protective vapor retarder before placement of permanent vapor retarder.
- B. Ensure that subsoil is approved by Architect and/or geotechnical engineer.

3.2 INSTALLATION

- A. Install vapor retarder in accordance with manufacturer's instructions and ASTM E 1643.
- B. Unroll vapor retarder with the longest dimension parallel with the direction of the concrete pour.
- C. Extend vapor retarder to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, waterstops, or any other site condition requiring early termination of the vapor retarder. At the point of termination, seal vapor retarder to the slab itself using perimeter/edge seal, such as Stego Crete Claw or termination bar and tape per manufacturer's instructions.
 - 1. Turn edge of sheeting down face of perimeter grade beam a minimum of 6".
- D. Overlap joints a minimum of 6" and seal with manufacturer's seam tape.
- E. Seal all penetrations (including pipes) with manufacturer's pipe boot.
- F. Use reinforcing bar supports with base sections that eliminate or minimize the potential for puncture of the vapor retarder.
- G. Repair damaged areas by cutting patches of vapor retarder, overlapping damaged area 6" and taping all four sides with tape.

END OF SECTION

SECTION 07 27 26

FLUID-APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Vapor-permeable, fluid-applied air barriers, which also function as water-resistive barriers.
- B. Related Requirements:
 - 1. Section 01 45 00 - Quality Control: for general mockup requirements.
 - 2. Section 01 45 23 - Testing and Inspection Services: for coordination with testing agency.
 - 3. Section 04 20 00 - Masonry Units; concrete unit masonry treatment.
 - 4. Section 06 16 56 - Air and Water-Resistive Sheathing Board System: for vapor-permeable air- and water-resistive wall sheathing and associated site-fluid-applied air barrier flashing.

1.2 DEFINITIONS

- A. Air-Barrier Material (AB): A primary element that provides a continuous barrier to the movement of air.
- B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air-Barrier Assembly: The collection of air-barrier materials and accessories applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.
- D. Water-Resistive Barrier (WRB): Water-shedding barrier made of material that is moisture-resistant, and installed to shed water, with sealed joints and penetrations, and with terminations sealed to adjacent surfaces.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review air-barrier requirements and installation, special details, mockups, air-leakage and bond testing, air-barrier protection, and work scheduling that covers air barriers.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's written instructions for evaluating, preparing, and treating each substrate;
- B. Shop Drawings: For air-barrier assemblies.
 - 1. Show locations and extent of air-barrier materials, accessories, and assemblies specific to Project conditions.
 - 2. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
 - 3. Include details of interfaces with other materials that form part of air barrier.
 - 4. Consult air barrier manufacturer for additional installation guidelines and illustrations to assist with meeting shop drawing requirements.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with the barrier.
 - 1. Certification shall include statement that materials proposed for use are permanently chemically compatible and adhesively compatible with adjacent materials proposed for use.
 - 2. Certification shall include statement that cleaning materials used during installation are chemically compatible with adjacent materials proposed for use.
- C. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.

- D. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Mockups: Build mockups to set quality standards for materials and execution and for preconstruction testing.
 - 1. Build integrated mockups of exterior wall assembly 150 sq. ft., incorporating backup wall construction, external cladding, window, storefront, door frame and sill, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air-barrier assembly.
 - a. Coordinate construction of mockups to permit inspection and testing of air barrier before external insulation and cladding are installed.
 - b. Include junction with roofing membrane, building corner condition, and foundation wall intersection.
 - c. If Architect determines mockups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Owner will engage qualified testing agency to perform preconstruction testing on field mockups.
- B. Mockup Testing: Air-barrier assemblies shall comply with performance requirements indicated, as evidenced by reports based on mockup testing by a qualified testing agency.
 - 1. Air-Leakage-Location Testing: Mockups will be tested for evidence of air leakage according to ASTM E 1186, chamber pressurization or depressurization with smoke tracers.
 - 2. Air-Leakage-Volume Testing: Mockups will be tested for air-leakage rate according to ASTM E 783 or ASTM E 2357.
 - 3. Water Penetration Testing: Mockups will be tested for water penetration according to ASTM E 1105.
 - 4. Adhesion Testing: Mockups will be tested for required air-barrier adhesion to substrate according to ASTM D 4541 (modified).
 - a. Use a type II pull tester, except that the membrane shall be cut through to separate the material attached to the disc from the surrounding material.
 - b. Perform test after curing period recommended by the material manufacturer.
 - c. Record mode of failure and area where the material failed in accordance with ASTM D4541.
 - d. The inspection report shall indicate whether the specified adhesion requirement has been met.
 - 5. Compatibility Determinations: Mockups will be inspected for visual signs of decay, chemical attack, or degradation of any kind. Suspect instances shall be reported to the corresponding manufacturer who shall provide a letter that approves moving forward with the project or rejects the use of the product or rejects the method or circumstances of installation with an appropriate explanation of the position taken.
 - 6. Notify Architect seven days in advance of the dates and times when mockups will be tested.
 - 7. Perform the air leakage test and water penetration test of mockups prior to installation of cladding and trim but after installation of all fasteners for cladding and trim, and after installation of other penetrating elements.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- B. Protect stored materials from direct sunlight.
- C. Deliver materials to Project site in original packages with seals unbroken, labeled with material Manufacturer's name, product, date of manufacture, and directions for storage.
- D. Store materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by material manufacturer.
- E. Handle materials in accordance with material manufacturer's recommendations.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended in writing by air-barrier manufacturer.
 - 1. Protect substrates from environmental conditions that affect air-barrier performance.
 - 2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.
- B. Sequencing. Do not install air barrier material before the roof assembly has been sufficiently installed to prevent a buildup of water in the interior of the building.
- C. Compatibility. Do not allow air barrier materials to come in contact with chemically incompatible materials.
- D. Ultra-violet Exposure. Do not expose air barrier materials to sunlight longer than as recommended by the material manufacturer.

1.10 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard form in which air barrier manufacturer agrees to furnish and install air barrier material to repair or replace those materials installed according to manufacturer's written instructions that exhibit material defects or otherwise fail to perform as specified under normal use within warranty period specified.
 - 1. Manufacturer's Warranty Period: Five (5) years from Date of Substantial Completion.
- B. Installer's Warranty: Provide installer's installation warranty, including all accessories and materials of the air barrier assembly, against failures including loss of airtight seal, loss of watertight seal, loss of attachment, loss of adhesion and failure to cure properly.
 - 1. Installer's Warranty Period: Two (2) years from Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.
 - 1. If the materials in this section are adjacent to the materials specified in Section 06 16 56 Air- and Water-Resistive Sheathing Board System, all materials in this section shall be compatible with the materials and products specified in that section and shall be approved by the air- and water-resistive sheathing board system manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Air-Barrier Performance: Air-barrier assembly and seals with adjacent construction shall be capable of performing as a continuous air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air-Barrier Assembly Air Leakage: Maximum 0.04 cfm/sq. ft. of surface area at 1.57 lbf/sq. ft., when tested according to ASTM E 2357.

2.3 MEDIUM-BUILD AIR BARRIERS, VAPOR PERMEABLE

- A. Medium-Build, Vapor-Permeable Air Barrier: Synthetic polymer material with an installed dry film thickness, according to manufacturer's written instructions, of 17 to 30 mils (0.4 to 0.8 mm) over smooth, void-free substrates.
 - 1. Basis of Design Product: Subject to compliance with requirements, provide Prosoco, Inc.; R-Guard Spray Wrap MVP (at medium-build thickness) or a comparable acrylic product by one of the following:
 - Tremco, Inc.
 - 3M Industrial Adhesives and Tapes Division.
 - DuPont Safety & Construction.
 - GE Construction Sealants; Momentive Performance Materials Inc.
 - Hohmann & Barnard, Inc.
 - W.R. Meadows, Inc.

2. Physical and Performance Properties:

- a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
- b. Vapor Permeance: Minimum 10 perms; ASTM E 96/E 96M, Desiccant Method, Procedure A.
- c. Ultimate Elongation: Minimum 250 percent; ASTM D 412, Die C.
- d. Adhesion to Substrate: Minimum 16 lbf/sq. in. when tested according to ASTM D 4541.
- e. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.
- f. UV Resistance: Can be exposed to sunlight for 120 days according to manufacturer's written instructions.
- g. Fastener Sealability: No water infiltration when tested in accordance with ASTM D 1970.

2.4 ACCESSORY MATERIALS

- A. Requirement: Provide primers, transition strips, termination strips, joint reinforcing fabric and strips, joint sealants, counterflashing strips, flashing sheets and metal termination bars, termination mastic, substrate patching materials, adhesives, tapes, foam sealants, lap sealants, and other accessory materials that are recommended in writing by air-barrier manufacturer to produce a complete air-barrier assembly and that are compatible with primary air-barrier material and adjacent construction to which they may seal.
- B. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.
- C. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304, 0.0187 inch thick, and Series 300 stainless-steel fasteners.
- D. Preformed Silicone Extrusion: Manufacturer's standard system consisting of cured low-modulus silicone extrusion, sized to fit opening widths, with a single-component, neutral-curing, Class 100/50 (low-modulus) silicone sealant for bonding extrusions to substrates.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Dow Corning Corporation.
 - b. GE Construction Sealants; Momentive Performance Materials Inc.
 - c. Pecora Corporation.
 - d. Prosoco, Inc.
 - e. Tremco Incorporated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
 2. Verify that substrates have cured and aged for minimum time recommended in writing by air-barrier manufacturer.
 3. Verify that substrates are visibly dry and free of moisture. Test concrete substrates for capillary moisture by plastic sheet method according to ASTM D 4263.
 4. Verify that masonry joints are flush and completely filled with mortar.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Clean, prepare, treat, fill, and seal substrate and joints and cracks in substrate according to manufacturer's written instructions and details. Provide clean, dust-free, and dry substrate for air-barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Remove fins, ridges, mortar, and other projections and fill honeycomb, aggregate pockets, holes, and other voids in concrete with substrate-patching material.

- E. Remove excess mortar from masonry ties, shelf angles, and other obstructions.
- F. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- G. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.
- H. Bridge isolation joints, expansion joints and discontinuous wall-to-wall, deck-to-wall, and deck-to-deck joints with air-barrier accessory material that accommodates joint movement according to manufacturer's written instructions and details.

3.3 ACCESSORIES INSTALLATION

- A. Install accessory materials according to air-barrier manufacturer's written instructions and details to form a seal with adjacent construction and ensure continuity of air and water barrier.
 - 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
 - 2. Install transition strip on roofing membrane or base flashing so that a minimum of 3 inches (75 mm) of coverage is achieved over each substrate.
 - 3. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 - 4. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.
- B. Connect and seal exterior wall air-barrier material continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- C. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- D. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- E. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames, with not less than 1 inch of full contact.
 - 1. Transition Strip: Roll firmly to enhance adhesion.
- F. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air-barrier material with foam sealant.
- G. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- H. Seal top of through-wall flashings to air barrier with an additional 6-inch-wide, transition strip.
- I. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- J. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches beyond repaired areas in strip direction.

3.4 PRIMARY AIR-BARRIER MATERIAL INSTALLATION

- A. Apply air-barrier material to form a seal with strips and transition strips and to achieve a continuous air barrier according to air-barrier manufacturer's written instructions and details. Apply air-barrier material within manufacturer's recommended application temperature ranges.
 - 1. Unless manufacturer recommends in writing against priming, apply primer to substrates at required rate and allow it to dry.
 - 2. Limit priming to areas that will be covered by air-barrier material on same day. Reprime areas exposed for more than 24 hours.

3. Where multiple prime coats are needed to achieve required bond or thickness, allow adequate drying time between coats.
- B. Medium-Build Air Barriers: Apply continuous unbroken air-barrier material to substrates according to the following thickness. Apply an increased thickness of air-barrier material in full contact around protrusions such as masonry ties.
 1. Vapor-Permeable, Medium-Build Air Barrier: Total dry film thickness as recommended in writing by manufacturer to comply with performance requirements, but not less than 17 mils, applied in two equal coats. Apply additional material as needed to achieve void- and pinhole-free surface, but do not exceed thickness on which required vapor permeability is based.
 - a. Second coat shall be back rolled in accordance with manufacturer's written instructions.
- C. Do not cover air barrier until it has been tested and inspected by testing agency.
- D. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Inspections: Air-barrier materials, accessories, and installation are subject to inspection for compliance with requirements. Inspections may include the following:
 1. Continuity of air-barrier system has been achieved throughout the building envelope with no gaps or holes.
 2. Air-barrier dry film thickness.
 3. Continuous structural support of air-barrier system has been provided.
 4. Masonry and concrete surfaces are smooth, clean, and free of cavities, protrusions, and mortar droppings.
 5. Site conditions for application temperature and dryness of substrates have been maintained.
 6. Maximum exposure time of materials to UV deterioration has not been exceeded.
 7. Surfaces have been primed, if applicable.
 8. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
 9. Termination mastic has been applied on cut edges.
 10. Strips and transition strips have been firmly adhered to substrate.
 11. Compatible materials have been used.
 12. Transitions at changes in direction and structural support at gaps have been provided.
 13. Connections between assemblies (air-barrier and sealants) have complied with requirements for cleanliness, surface preparation and priming, structural support, integrity, and continuity of seal.
 14. All penetrations have been sealed.
- C. Tests: As determined by testing agency from among the following tests:
 1. Air-Leakage-Location Testing: Air-barrier assemblies will be tested for evidence of air leakage according to ASTM E 1186, chamber pressurization or depressurization with smoke tracers.
 2. Air-Leakage-Volume Testing: Air-barrier assemblies will be tested for air-leakage rate according to ASTM E 783 or ASTM E 2357.
 3. Adhesion Testing: Air-barrier assemblies will be tested for required adhesion to substrate according to ASTM D 4541 for each 600 sq. ft. of installed air barrier or part thereof.
- D. Air barriers will be considered defective if they do not pass tests and inspections.
 1. Apply additional air-barrier material, according to manufacturer's written instructions, where inspection results indicate insufficient thickness.
 2. Remove and replace deficient air-barrier components for retesting as specified above.
- E. Repair damage to air barriers caused by testing; follow manufacturer's written instructions.
- F. Prepare test and inspection reports.

3.6 CLEANING AND PROTECTION

- A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

1. Protect air barrier from exposure to UV light and harmful weather exposure as recommended in writing by manufacturer. If exposed to these conditions for longer than recommended, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed materials according to air-barrier manufacturer's written instructions.
 2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended in writing by manufacturer of affected construction.
- C. Remove masking materials after installation.

END OF SECTION

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SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Sheet metal flashing and trim.
- B. Related Sections:
 - 1. Section 07 92 00 - Joint Sealants.
 - 2. Section 09 91 00 - Painting.

1.2 SUBMITTALS

- A. Samples:
 - 1. Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
 - 2. Submit for approval samples of parapet coping cover expansion joint and soldered joint.
- B. Product Certificates:
 - 1. Showing that each type of coping and roof edge flashing is ANSI/SPRI/FM 4435/ES-1 tested.
 - 2. Showing that each type of gutter securing the perimeter edge of the roof membrane on low-slope (less than 2:12 slope) built-up, modified bitumen and single-ply roofs is ANSI/SPRI GT-1 tested for Test Methods G-1 and G-2.
- C. Evaluation Reports:
 - 1. For copings and roof edge flashing, from an agency acceptable to authority having jurisdiction showing compliance with ANSI/SPRI/FM 4435/ES-1.
 - 2. For gutters securing the perimeter edge of the roof membrane on low-slope (less than 2:12 slope) built-up, modified bitumen and single-ply roofs, from an agency acceptable to authority having jurisdiction showing compliance with ANSI/SPRI GT-1, Test Methods G-1 and G-2.

1.3 QUALITY ASSURANCE

- A. Standard: Comply with the requirements of the Architectural Sheet Metal Manual published by SMACNA.
- B. Installer Qualifications: Company specializing in sheet metal flashing work with three years minimum experience in similar sized installations

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, handle and protect products under provisions of SECTION 01 65 00 - PRODUCT DELIVERY REQUIREMENTS and SECTION 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS.
- B. Stack pre-formed material to prevent twisting, bending, and abrasions, and to provide ventilation.
- C. Prevent contact with materials which may cause discoloration or staining.

1.5 WARRANTY

- A. Furnish to the Owner a written warranty providing the following without cost to the Owner.
 - 1. Sheet metal roof flashings shall be maintained in normal repair and free of leaks for a period of 2 years from the date of acceptance of the roof.
 - 2. At end of 2-year period, Owner and Contractor shall make final inspection of flashing work. Holes, breaks and other defects shall be promptly repaired at the Contractor's expense.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Sheet Metal: ASTM A 653, Steel Sheet, Zinc-Coated (Galvanized)
 - 1. Roof top accessories, including but not limited to, expansion joint covers, flanges, and concealed counterflashings not visible from ground level shall be Coating Designation G90 Paint Grip, zinc coated (galvanized) copper-bearing steel sheet, mill-phosphatized ready to receive field finishing in accordance with SECTION 09 91 00 - PAINTING
 - 2. Areas which can be seen from the ground level, including but not limited to, coping, edging, gutters, conductor heads, downspouts, and expansion joint terminations shall be zinc coated (galvanized) copper-bearing steel sheet prefinished with fluorocarbon coating containing 70% Kynar 500. Colors shall be selected by Architect from Fluoropon Standard colors as manufactured by Valspar.
- B. Reglet: Two piece snaplock receiver, Per Figure 4-4C, SMACNA Manual, 8th Edition, of 24 gauge galvanized steel.
- C. Underlayment: ASTM D 226, 30 lb/100 s.f. weight felt containing no additives corrosive to sheet metals.
- D. Solder: ASTM B 32, made from block tin and pig lead (50/50) with no antimony.
- E. Solder for Stainless Steel: ASTM B 32, Grade Sn60, with an acid flux of type recommended by stainless-steel sheet manufacturer.
- F. Fasteners for Stainless-Steel Sheet: Series 300 stainless steel.
- G. Sealant: Two component polyurethane, non-sagging, sealant as specified in SECTION 07 92 00 - JOINT SEALANTS.
- H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.
- I. Miscellaneous items such as nails and mastic shall be furnished as required by the conditions of use and must be of the best grade available.

2.2 FABRICATION

- A. Form sections true to shape, accurate in size, square, free from distortion and defects, to profiles indicated in accordance with SMACNA Architectural Sheet Metal Manual.
- B. Fabricate cleats and starter strips of same material as sheet, interlockable with sheet.
- C. Form pieces in longest practical lengths.
- D. Hem exposed flashings on underside ½"; miter and seam corners.
- E. Solder and seal metal joints except those indicated or required to be expansive type joints. After soldering, remove flux. Wipe and wash solder joints clean.
- F. Fabricate corners from one place with minimum 18" long legs; solder for rigidity; seal with sealant.
- G. Fabricate vertical faces with bottom edge formed outward ¼" and hemmed to form drip.
- H. Fabricate flashings to allow toe to extend minimum 2" over wall surfaces.
- I. Fabricate as much as possible in shop with machinery to eliminate as much hand tooling on the job as possible. Shop fabricate to allow for adjustments in the field for proper anchoring and joining.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and conditions are ready to receive work of this section. Notify Architect of any existing conditions which will adversely affect execution. Beginning of execution will constitute acceptance of existing conditions.
- B. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, cant strips and reglets in place, and nailing strips located.
- C. Verify membrane termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

- A. Field measure site conditions prior to fabricating work.
- B. Install starter and edge strips, and cleats before starting installation.
- C. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.
- D. Install one layer of underlayment prior to installing copings.

3.3 INSTALLATION

- A. General: Fabricate, assemble, and install sheet metal work in conformance with referenced standard.
 - 1. Make adequate provision for metal expansion and contraction without buckling or splitting. Use cleats and watertight slip and expansion joints.
 - 2. Nails and screws shall be of the same metal as the member on which used. Nails through exposed wash surfaces will not be permitted.
 - 3. When soldering, use flux and wash off surplus flux after soldering has been completed.
 - 4. Set sheet metal with horizontal lines straight and level. Surfaces shall be flat without wrinkles and waves. Profiles shall align at joints with no offsets.
 - 5. Conform to drawing details included in manuals published by SMACNA and NRCA.
 - 6. Edge Securement for Low-Slope Roofs: Design in accordance with ANSI/SPRI ES-1 for basic wind speed zone with 3-second gusts.
 - 7. Gutter Securement for Low-Slope Roofs: Design in accordance with ANSI/SPRI GT-1 for basic wind speed zone with 3-second gusts.
 - 8. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.
 - 9. Seal metal joints watertight.
 - 10. Provide electrolytic separation between dissimilar metals with protective back paint.
- B. Reglet: Install surface mounted reglets on walls.
 - 1. Clean surface of oil, grease and loose particles.
 - 2. Place sealant bead on back in groove and on lap.
 - 3. Secure reglet in precise alignment to wall with power driven pins spaced 12" o.c.
 - 4. Lap joints 3" and bed in sealant. Miter and seal corners.
- C. Reglet Counterflashing: Counterflashing for reglet shall be formed of 24 gage metal to fit the reglet in conformance with the manufacturer's instructions.
 - 1. Lap counterflashing down over flashing strip approximately 4" and form lower edge with a spring bend against the base flashing.
 - 2. After roofing and flashing strip have been installed, snap counter-flashing up into reglet so that it is held securely in place without screws or clips.
 - 3. Lap end joints 3" and bed in sealant. Miter and seal corners.
- D. Parapet Coping Cover: Form and install coping covers and fascia covers of 24 gage metal. Finish coping covers with a fluorocarbon coating containing 70% Kynar 500. Color shall be selected from Fluropon Standard colors as manufactured by Valspar.
 - 1. Make up the coping in 10 ft. lengths.
 - 2. Bend outside bottom edge to form drip and lock to continuous cleat, 22 gage min., secured to wood blocking with nails and to masonry with screws into expansion shields.

3. On roof side copings shall be fastened through slotted holes located 2' o.c. with screws and watertight washers.
 4. Provide loose-locked expansion joints filled with sealant where each 10' section meets. Provide an
- E. Vent Stack Roof-Penetration Flashing: Flashing shall have a weight range of 2 – 4 lbs/sq. ft. Coordinate installation of roof-penetration lead flashing flange with installation of roofing and other items penetrating roof. Base flashing shall be flanged 4 in. onto the roof. The flange is fastened through the roofing felts and is then stripped in by the roofer. Turn the top of the flashing down inside the vent pipe. Seal with sealant per Section 07 92 00 – Joint Sealants, and clamp flashing to pipes that penetrate roof.
- F. Downspout: Form and install downspouts of 24 gage metal.
1. Install with the top slipped up over the outlet sleeve and anchor to the wall with 2" wide by 18 gage metal straps fastened with galvanized bolts into metal expansion shields.
 2. For each downspout, set the straps at the top, bottom and at intermediate points spaced not more than 8' apart.
- G. Gutter: Form and install hung molded gutters of 26 gage metal at roof eaves. At gutters securing the perimeter edge of the roof membrane on low-slope (less than 2:12 slope) built-up, modified bitumen and single-ply roofs, form and install hung molded gutters of nominal thickness as required to meet performance of SPRI GT-1 requirements.
1. Provide watertight lap or butt type expansion joints at intervals of 50 ft. and not more than 16 ft. from inside and outside corners.
 2. Support molded outside edge with 1" wide 18 gage strap hangers at 36" centers and weld to gutter as detailed.
 3. Form downspout outlet sleeves and rivet and solder sleeves to gutter. Fit each sleeve with a removable, galvanized wire basket strainer.
- H. Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 feet and a continuous metal receiver with integral drip-edge cleat to engage fascia cover and secure modified roof membrane. Provide matching corner units.
1. Metallic-Coated Steel Sheet Fascia Covers: Zinc-coated (galvanized) steel, nominal thickness as required to meet performance SPRI ES-1 requirements.
 - a. Surface: Smooth, flat finish.
 - b. Finish coping covers with a fluorocarbon coating containing 70% Kynar 500. Color shall be selected by Architect from Fluoropon Standard colors as manufactured by Valspar.
- I. Fascia/Scupper: Form and install fascia/scupper of 24 gage metal at roof edge where shown.
1. Make up fascia/scupper in 10' lengths with scupper continuously soldered.
 2. Install over the single-ply roofing membrane on flashing tape and nail flange with nails spaced in staggered pattern 6" on centers near the back edge.
 3. Bend outside bottom edge to form drip and lock to continuous heavy gauge cleat secured to wood blocking with nails.
 4. Strip the horizontal flange with another layer of single-ply roofing membrane.
 5. Lap end joints 8" and bed in roof cement (roof cement must be approved by single-ply membrane manufacturer). Miter and seam solder the joints at corners before installing them on single-ply membrane.
- J. Fascia/Gutter: Form and install fascia/gutter of 24 gage metal at roof edge where shown.
1. Make up fascia/gutter in 10' lengths with scupper continuously soldered.
 2. Install over the single-ply roofing membrane on flashing tape and nail flange with nails spaced in staggered pattern 6" on centers near the back edge.
 3. Strip the horizontal flange with another layer of single-ply roofing membrane.
 4. Lap end joints 8" and bed in roof cement (roof cement must be approved by single-ply membrane manufacturer). Miter and seam solder the joints at corners before installing them on single-ply membrane.
- K. Conductor Head: Provide conductor heads of 22 gage metal, riveted and soldered watertight.
1. outlet sleeve to fit downspout, rivet and solder sleeve into downspout.
 2. Solder ¼" mesh galvanized wire screen over conductor head top.
 3. Attach conductor head to wall with masonry fasteners.
 4. Loose lock conductor head to scupper and solder watertight.
 5. Provide overflow 1" below level of scupper.

- L. Splash Pans: Provide 24 gage galvanized metal splash pans where downspouts discharge onto roofs. Install pans in mastic (mastic must be approved by membrane manufacturer) to set flat on the roof and secure to downspouts by riveting and soldering.
- M. Miscellaneous flashings and other items of sheet metal roof work shall be provided as required for a weathertight job.

END OF SECTION

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SECTION 07 65 00

FLEXIBLE FLASHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Flexible stainless steel self-adhering flashing.
- B. Related Sections:
 - 1. Section 04 20 00 - Masonry Units.
 - 2. Section 05 40 00 - Cold-formed Metal Framing.
 - 3. Section 06 16 56 - Air- and Water-Resistive Sheathing Board System.
 - 4. Section 07 27 26 - Fluid-Applied Membrane Air Barriers.
 - 5. Section 07 62 00 - Sheet Metal Flashing and Trim.

1.2 REFERENCES

- A. Standards of the following as a reference:
 - 1. ASTM.
 - 2. Brick Industry Association (BIA).
 - 3. Recycled content & Recyclability.
- B. Federal Government Publications: www.epa.gov/nscep.
 - 1. 40 CFR 59, Subpart D-200 - National Volatile Organic Compound Emission Standards for Architectural Coatings.
- C. National Fire Protection Association (NFPA): www.nfpa.org.
 - 1. NFPA 285 – Standard Fire Test Method For Evaluation Of Fire Propagation Characteristics Of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.
- D. American Architectural Manufacturers Association (AAMA): www.aamanet.org.
 - 1. AAMA 711-20 Voluntary Specification for Self-Adhering Flashing Use for Installation of Exterior Wall Fenestration Products.
- E. Sealant, Waterproofing, and Restoration Institute (SWRI): www.swrionline.org.
 - 1. SWRI Validation Program.
- F. Industry standards:
 - 1. BIA Technical Notes on Brick Construction No. 7, Water Penetration Resistance- Design and Detailing, November 2017.
 - 2. BIA Technical Notes on Brick Construction No. 28B, Brick Veneer/Steel Stud Walls, December 2005.

1.3 DEFINITIONS

- A. Terms:
 - 1. Cavity wall flashing: Same as flexible flashing.
 - 2. Foundation sill flashing: Same as flexible flashing.
 - 3. Flexible flashing: Water-proof material typically used in cavity wall construction to contain and assist in the proper water drainage that may penetrate the wall system veneer. Other materials may be required to constitute the system.
 - 4. Head and sill flashing: Same as flexible flashing.
 - 5. Through-wall flashing:
 - a. Generally considered the same as flexible flashing.
 - b. Rare definition referred to full-width cap flashing under copings or wall caps.

1.4 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

- B. Product Data: For each type of product. Indicate material type, composition, thickness, and installation procedures.
- C. Shop Drawings: For the following flashing materials that are specially fabricated:
 - 1. Fabricated Flashing: Detail corner units, end-dam units, step flashing and other special applications.
- D. Samples:
 - 1. Flexible flashing material, 3" by 5".
 - 2. Premanufactured inside and outside corners.
 - 3. Fabricated step flashing and other special applications.
 - 4. Drip plate, 6" long.
 - 5. Drip plate premanufactured inside and outside corners.
 - 6. Premanufactured end dams, for each application.
 - 7. Termination bar, 6" long.
- E. Certificates:
 - 1. From flexible flashing manufacturer, certifying compatibility (including adequate adhesion) of flexible flashing and accessory materials with Project materials that connect to or that come in contact with flexible flashing.
 - 2. Certifying the use of domestic manufactured stainless steel for flashing.

1.5 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Manufacturer: Provide flashing materials by a single manufacturer with not less than twenty-five years of experience in manufacturing flexible flashing products.
- B. Materials:
 - 1. Flashing materials must be able to withstand 250° F temperature without changing the long-term performance of the flashing.
- C. Pre-installation Conference:
 - 1. At a scheduled pre-installation conference with all trades, contractor shall review flashing for the project and how the flashing shall be sequenced with the following: below grade waterproofing, air and vapor system, window installation, sealant installation, relief angles and roofing.
- D. Mock-up:
 - 1. Provide mock-up of complete flashing system, including flexible flashing, drip plate, inside and outside corners, end dams, step flashing, termination bar, flashing/drip plate joints and sealant.
 - 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 WARRANTY

- A. 20-year manufacturer's warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

- A. Flexible flashing:
 - 1. Basis of Design Product: York 304 SA by York Manufacturing, Inc.
 - 2. Products of manufacturers listed below meeting indicated standards and specified manufacturer's product data characteristics are acceptable for use, subject to compliance with specified requirements.
 - Momentive; Elemax SS Flashing
 - Vapro Shield, Inc.; Vapro-SS Flashing
 - Wire Bond; Bond-N-Flash S.A.
 - York 304 SA
 - 3GEN Masonry Products, Inc.; Genflash SS SA
 - NO SUBSTITUTIONS.
 - 3. Characteristics:

- a. Type: Stainless steel core with one 2 mils uncoated (bare) stainless steel face (outward facing) bonded to a minimum 8 mils thick adhesive (inward facing), to produce an overall minimum thickness of 10 mils.
 - b. Stainless Steel: Type 304 ASTM A240. Domestically sourced per DFARS 252.225-7008 and/or DFARS 252.225-7009.
 - c. Adhesive: Butyl or acrylic.
 - d. Primer: As required by flashing manufacturer.
 - e. UV resistant.
 - f. Fire Resistant: ASTM E84 Class A material.
 - g. Mold Resistant: Passes ASTM D3273.
 - h. Passes AAMA 711-20.
 - i. Passes air barrier material test: ASTM E2178-13.
 - j. Size: Manufacturer's standard width rolls.
- B. Accessories:
1. Sealant, Mastic and Primer: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding and sealing flashing sheets to each other and to substrates.
 2. Flashing Corners and End Dams: Type 304 stainless steel, 26 gauge, premanufactured inside/outside corners and end dams.
 3. Backer Plate: 6" x 20 ga. galvanized sheet metal backer plate behind sheathing at stud walls, for securing termination bar.
 4. Termination Bar: Type 304 stainless steel, 26 gauge termination bar with sealant lip on top edge.
 5. Drip Plate: Type 304 stainless steel, 26 gauge, 3" drip plate with 1/4" 30-degree angled and hemmed outside edge, including premanufactured inside/outside drip plate corners and end dams.
 - a. Basis of Design product shall be York Stainless Steel Drip Edge. At locations detailed without an exposed angled drip edge, the Basis of Design product shall be York Stainless Steel Drip Edge with non-angled hemmed outside edge.
 - b. Outside Corners: Basis of Design product shall be York Stainless Steel Drip Edge Corners, fabricated from single piece of sheet metal, without joints or seams. Manufacturer shall grind down point of outside corner to provide an eased corner free from sharp points and edges, prior to shipment of material.
 - c. Inside Corners, End Dams and Step Flashings: Fabricated from one or two pieces of sheet metal. Seams shall be overlapped, and welded or soldered.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
1. Install where indicated, specified, or required according to flashing manufacturer's written instructions and as follows.
 2. Prime substrate for installation of flexible flashing if recommended by material manufacturer.
 3. Flashing Width: Width of flashing material required starting flush with 3/4" back from the outside face of exterior wythe, extending through the cavity, rising height required to extend above lintel steel at least 2", unless otherwise detailed.
 4. Flashing Length:
 - a. Flexible flashing shall be continuous where possible. Where joints are necessary, splice end joints by overlapping flashing at least 2" and seal with a compatible sealant recommended by flashing manufacturer.
 - b. Extend flashing 8" beyond openings. At the end of flashing at openings or other horizontal flashing terminations, use premanufactured sheet metal end dam units.
 5. Masonry and Concrete Back-up:
 - a. Surface apply after air barrier or dampproofing installation in accordance with manufacturer's installation instructions.
 - b. Fasten to masonry backup surface at the top by using a termination bar. Fasten termination bar to masonry back-up at 8" o.c., and seal top edge with compatible sealant recommended by flashing manufacturer.
 6. Stud Back-up with Sheathing:
 - a. Fasten to stud backup at the top using a termination bar.
 - 1) Install continuous galvanized sheet metal backer plate to face of studs, behind sheathing.
 - 2) Fasten termination bar to studs and continuous sheet metal backer plate at 8" o.c.
 - 3) Seal top edge of termination bar with compatible sealant recommended by flashing manufacturer.
 7. Drip Plates: Install stainless steel drip plate at all flashing terminations at face of masonry. Install premanufactured corner units at all inside and outside corners. Set drip plates in full bed of sealant.

8. End Dams:
 - a. At lintels and heads, extend flashing 8" past opening at each end, and install premanufactured stainless steel sheet metal end dams.
 - b. At shelf angles, sills and other horizontal flashing terminations, install premanufactured stainless steel sheet metal end dams at each end.
9. Inside and Outside Corners: Install premanufactured corners from the manufacturer.
10. Step Flashings: Install fabricated stainless steel sheet metal step flashings where through-wall flashings are required to step down to meet detail requirements.
11. Stop membrane 3/4" back from face of masonry and install membrane using hard roller and roll the membrane with constant, firm pressure to ensure uniform contact with the substrate.
 - a. Provide guideline on drip plate at 3/4" location to facilitate installation of flexible flashing at proper location, as well as to facilitate Architect's field observations.
 - b. Apply sealant recommended by flashing manufacturer to leading edge of flexible flashing at drip plate as well as at all other termination edges of flashing.
12. Leave ready for air barrier transition flashing, installed in another Section, to be installed over sealed termination bar.
13. Cavity drainage material, weeps and other masonry accessories shall be installed per Section 04 20 00 Masonry Units.
14. Cover flashing within a few days of installation to protect it from damage from the different trades, the environment, and falling debris. If the flashing is punctured, torn or has loose poly, replace the damaged flashing material.

3.2 SCHEDULES

- A. Locations:
 1. Exterior door heads.
 2. Window heads.
 3. Other wall openings.
 4. Horizontal control joints.
 5. Changes in veneer materials, vertically.
 6. Over steel lintels, plates and angles in exterior masonry walls.
 7. Within masonry parapets and walls as through flashing to detail.
 8. At the bottom of cavity walls with weep holes.
 9. Under window sills to detail.
 10. Other locations indicated.

END OF SECTION

SECTION 07 84 00

FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Firestopping for all fire-rated construction complete, including, but not limited to:
 - 1. Firestopping in conjunction with gypsum board, masonry and plaster partitions.
 - 2. Firestopping shall include, but not be limited to the following applications:
 - a. Sealing gaps between tops of partitions and roof/floor decks.
 - b. Sealing gaps between structure and glass curtainwalls with fire safing insulation.
 - c. Other locations where "firestopping", "firestop", or "safing" is indicated.
 - d. Where required by codes.
 - e. Control joints and expansion joints in masonry or gypsum board fire-rated partitions.
 - f. Expansion joints in roof and floor assemblies.
- B. Related Sections:
 - 1. Section 04 20 00 - Masonry Units.
 - 2. Section 07 21 00 - Building Insulation.
 - 3. Section 07 92 00 - Joint Sealants.
 - 4. Section 09 21 13 - Plaster Assemblies.
 - 5. Section 09 21 16 - Gypsum Board Assemblies.
 - 6. Divisions 23 and 26.

1.2 SUBMITTALS

- A. Refer to SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data: Submit copies of manufacturer's literature. Include data substantiating that materials comply with specified tested system requirements.
- C. Samples: Submit duplicate samples of each type of firestopping material and accessories.
- D. For those firestop applications that exist for which no UL tested system is available through a manufacturer, an engineering judgement derived from similar UL system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineer judgement drawings must follow requirements set forth by the International Firestop Council.

1.3 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Do not allow firestopping materials to become wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection.

1.4 PROJECT CONDITIONS

- A. Do not install firestopping materials until building is completely enclosed and weathertight.
- B. Coordinate installation with the work of other trades. Reference SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION.

PART 2 - PRODUCTS

2.1 PRODUCT/MATERIAL PERFORMANCE REQUIREMENTS

- A. Except as otherwise indicated, firestop materials shall be classified in the Underwriters Laboratories (UL) Building Materials Directory, "Section XHEZ-Through-Penetration Firestop Systems", and/or "Section XHHW-Fill Void or Cavity Materials", and "Section XHBN - Joint Systems" for specific project conditions:
 - 1. Time rating ("F", Fire and "T", Temperature) (T-rating is only required for construction joint systems).
 - 2. Floor or wall assembly and material.
 - 3. Penetrating materials/items diameters, or void space.

4. Through opening size.
 5. Annular space between penetration opening and penetrating item.
- B. Firestopping materials shall provide a fire-rating commensurate with the adjacent construction rating.
- C. Firestop materials shall comply with ASTM E 84: Surface Burning Characteristics.
- D. Firestop materials shall have been tested in accordance with ASTM E 814, UL 1479 or UL 2079.
- E. Firestop materials shall be free of asbestos.
- F. Firestop materials shall be paintable or capable of receiving finish materials in those areas which are exposed to view and which are scheduled to receive finishes.
- G. Obtain firestop products from a single manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Installer must examine substrate and conditions under which firestopping work is to be performed, and notify Contractor in writing of any unsatisfactory conditions.

3.2 INSTALLATION

- A. Install firestopping materials including foaming, packing and accessory materials to fill openings around penetrations in floors and walls, to seal gaps between decks and partitions, gaps between structure and curtainwall, etc., to provide fire-stops with fire resistance ratings indicated for floor or wall assembly in which penetration occurs. Use silicone based materials for all wet or damp conditions.
- B. Install firestop materials and systems in accordance with manufacturer's printed instructions and applicable UL Building Materials Directory assemblies.
- C. Cut and friction fit fire safing type insulation firestopping to completely fill all gaps and voids. Provide stick-clips, sheet metal closures, and any other accessories to support insulation.
- D. Where floor openings are 4" or more in width and subject to traffic or loading, install firestopping materials capable of supporting same loading as floor.
- E. Remove damming materials after curing if made of other than fire resistant materials.
- F. Protect materials from damage on surfaces subject to traffic.

3.3 FIELD TESTING

- A. Firestop materials and installation shall be tested by an independent testing laboratory. Refer to SECTION 01 45 23 - TESTING AND INSPECTION SERVICES.
- B. Where deficiencies are found or penetration and joint firestopping systems are damaged or removed due to testing, repair or replace penetration and joint firestopping systems so they comply with requirements.
- C. Proceed with enclosing penetration and joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.4 CLEAN UP

- A. Clean up all debris caused by the work of this Section, keeping the premises clean and neat at all times.

B. Clean adjacent surfaces soiled by the work of this section.

END OF SECTION

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SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Sealing and caulking of joints.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete.
 - 2. Section 04 20 00 - Masonry Units.
 - 3. Section 07 62 00 - Sheet Metal Flashing and Trim.
 - 4. Section 07 84 00 - Firestopping.
 - 5. Section 08 80 00 - Glazing.
 - 6. Section 09 21 16 - Gypsum Board Assemblies.
 - 7. Section 32 13 13 - Concrete Paving

1.2 SUBMITTALS

- A. Submit under provisions of SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Submit product data indicating sealant chemical characteristics, performance criteria, limitations, color availability and application instructions.
- C. Submit two samples ¼" diameter x 4" in size illustrating color selections available.
- D. Submit manufacturer's certificate under provisions of SECTION 01 45 00 - QUALITY CONTROL that products meet or exceed specified requirements.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum 3 years documented experience.
- B. Applicator: Company specializing in applying the work of this section with minimum 3 years documented experience and approved by sealant manufacturer.
- C. Conform to Sealant and Waterproofers Institute requirements for materials and installation.

1.4 FIELD SAMPLES

- A. Provide samples under provisions of SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Construct one field sample joint, 5 feet long, illustrating sealant type, color, and tooled surface.
- C. Locate where directed.
- D. Accepted sample may remain as part of the work.

1.5 PROJECT CONDITIONS

- A. Environmental Requirements: No caulking shall be done at temperatures below 40°F.

1.6 WARRANTY

- A. Furnish to the Owner a written warranty that the sealants shall remain watertight for a period of 2 years from the date of acceptance of the building. Joints which prove defective by leaking, cracking, melting or shrinking of the sealant shall be re-sealed without additional expense to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Reference "SEALANT SCHEDULE" at end of this specification section for locations of Sealant Types.
- B. Modified Polyurethane (Type 1 Sealant):
 - 1. Two or three-part conforming to ASTM C 920, Type M, Grade NS, Class 25.
 - 2. Color: Custom colors as selected by Architect.
 - 3. Acceptable products:
 - Sikaflex NP2 (formerly MasterSeal NP2), Sika USA.
- C. Pourable Urethane (Type 2 Sealant):
 - 1. Multicomponent conforming to ASTM C 920, Type M, Grade P (pourable), Class 25, Use T (traffic).
 - 2. Color: Custom color as selected by Architect.
 - 3. Acceptable products:
 - Urexpand NR-200, Pecora Corp.
 - Sikaflex SL 2 (Formerly MasterSeal SL 2), Sika USA.
 - THC 900 (Self leveling) or 901 (low sag), Tremco.
- D. Silicone, General Purpose (Type 3 Sealant)
 - 1. One-part low modulus rubber based silicone conforming to ASTM C 920, Type S, Grade NS, Class 100/50.
 - 2. Color: As selected by Architect.
 - 3. Acceptable products:
 - Dowsil 790 Silicone Building Sealant, Dow Corning.
 - SCS2700 Silpruf LM, GE Silicones.
 - Spectrem 1, Tremco.
- E. Polyurethane Hybrid, Paintable (Type 4 Sealant):
 - 1. One-part, moisture-cure, polyurethane hybrid sealant for interior use, conforming to ASTM C 920, Type S, Grade NS, Class 35 and Fed. Spec TT-S-00230C, Class A, Type II.
 - 2. Acceptable product:
 - Dymonic FC, Tremco
- F. Silicone, Sanitary (Type 5 Sealant):
 - 1. One-part conforming to ASTM C 920, Type S, Grade NS, Class 25, F.D.A. Regulation 21 CFR177.2600, and FDA Food Additive Regulation 121.2514.
 - 2. Color: Clear.
 - 3. Acceptable products:
 - 786 Silicone Sealant - M, Dow Corning.
 - SCS1700 Sanitary, GE Silicones.
- G. Acrylic Latex (Type 6 Sealant)
 - 1. One-part, non-sag acrylic latex, siliconized, conforming to ASTM C 834, Type OP, Grade NF or -18° C.
 - 2. Acceptable products:
 - AC-20+, Pecora Corp.
 - Tremflex 834; Tremco.
- H. Acoustical Sealant (Type 7 Sealant):
 - 1. Acrylic Latex Acoustical sealant for concealed locations.
 - 2. Acceptable products:
 - AC-20 FTR Acoustical and Insulation Sealant, Pecora Corp.
 - Acoustical Sealant, Tremco
 - Sheetrock Acoustical Sealant; USG Co.

- I. Silicone Sealant (Type 8 Sealant):
 - 1. Refer to Civil Specifications

2.2 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: ASTM D 1056 and C 1330. In vertical joints use closed cell polyethylene foam rod; oversized 30 to 50 percent larger than joint width. In horizontal joints, use solid neoprene or butyl rubber, Shore A hardness of 70.
 - 1. At Exterior Insulation and Finish Systems, provide closed cell at both horizontal and vertical joints.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and joint openings are ready to receive work and field measurements are as shown on drawings and recommended by the manufacturer.
- B. Beginning of installation means installer accepts existing substrate.

3.2 PREPARATION

- A. Joint surfaces shall be clean and dry. Remove loose mortar and other material completely with compressed air or by brushing.
 - 1. Joints to be caulked shall be at least 1/4" wide unless specifically specified smaller. At any point where the width of the joint is appreciably less, cut or grind out the joint to that width to assure an adequate volume of sealant along the length of the joint, except at concrete paving joints, those shall remain 1/8" wide as indicated.
 - 2. Pack with backing material the voids and recesses around metal frames which are deeper than the depth required for caulking. Leave the proper depth for the sealant.
 - 3. In open joints and where detailed, install rod stock as backing material. Roll the material into the joints to avoid stretching. The natural thickness of the rod stock shall be approximately twice the thickness of the joint in which it is installed.
 - 4. In raked masonry joints, apply a bondbreaker strip of polyethylene or masking tape along the bottom of the joints.
 - 5. Where sealant is to be applied against smooth metal surfaces, wipe these surfaces clean with a suitable ketone solvent immediately prior to caulking.
 - 6. Particular attention shall be paid to the preparation of horizontal joints in wear surfaces to be filled with sealant. Adjust joint depth to comply with sealant manufacturer's recommendations by malleting down the joint filler or filling in with rod stock as may be required. Joints in concrete paving shall be primed in accordance with manufacturer's recommendations.
 - 7. Perform preparation in accordance with ASTM C 1193 for solvent release sealants, C 1193 for latex base sealants, C 919 for acoustical applications, and C 1193 for elastomeric sealants.

3.3 APPLICATION

- A. Priming: Prime porous joint surfaces, particularly masonry and concrete. Test the primer to make sure it causes no staining of the material on which it is applied.
- B. Depth of sealant: Seal joints to a depth of approximately 1/2 the joint width, but never less than 1/4" deep. Follow the sealant manufacturer's recommendations where possible.
- C. Apply the sealant in accordance with the manufacturer's instructions.
 - 1. Force the sealant into joints with enough pressure to expel all air and provide a solid filling. Correct any flowing or sagging before final inspection is made.
 - 2. Where adjacent surfaces permit, use masking tape to obtain straight, even lines. Remove tape immediately after the joints have been sealed.

3. Fill joints flush with adjacent surfaces except where a recessed joint is specifically detailed. Tool beads with a sled runner or similar tool to insure full contact with joint faces.
4. For caulking horizontal joints in wear surfaces, use a gun with a narrow nozzle. Apply the flow type sealant with the nozzle riding along the bottom so that the sealant is forced up to completely fill the slot without cavities. Provide and use a portable vacuum cleaner to remove loose dirt from the joints just ahead of the caulking gun.

D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

E. Tool joints concave. Sealant shall achieve a firm skin before surface coating is applied.

3.4 CLEANING/REPAIRING

A. Clean adjacent surfaces of soiling due to caulking operations. This applicator shall be responsible for and shall bear the cost of replacing any material damaged or discolored due to caulking operations.

B. Repair or replace defaced or disfigured finishes caused by work of this section.

3.5 SEALANT SCHEDULE

A. Locations specified below for sealants and caulking required under this section are general and shall not be considered as affecting the required use of sealing compounds specified under other sections of the specifications.

<u>SEALANT TYPE</u>	<u>APPLICATION</u>
1	<ol style="list-style-type: none">a. Vertical control and expansion joints in exterior and unpainted interior masonry surfaces.b. Vertical joints at perimeter of window, door, and storefront elements where adjacent to stone, masonry, or concrete surfaces.c. Reglets: The top groove along the surface-mounted flashing reglets.d. Sealing joints in sheet metal fabrications.e. Unless noted otherwise, any other exterior vertical joints.
2	<ol style="list-style-type: none">a. Interior horizontal control and expansion joints in flooring, stone, masonry and tile flooring and at junctures between these materials and other adjacent materials.
3	<ol style="list-style-type: none">a. Sealing of joints between plumbing fixtures and substrates and between plastic laminate splashes and adjacent tops and walls.b. Threshold and windowsills set in full bed of sealant.
4	<ol style="list-style-type: none">a. General caulking as part of interior painting in joints subject to movement.
5	<ol style="list-style-type: none">a. Sealing joints between countertops and substrates in concession areas and elsewhere which may be in contact with food.
6	<ol style="list-style-type: none">a. General caulking as part of interior painting.
7	<ol style="list-style-type: none">a. Setting sill track, head track, and end studs to substrates on acoustically rated partitions. Refer to SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES for application requirements.
8	<ol style="list-style-type: none">a. Exterior horizontal control and expansion joints in concrete paving.

END OF SECTION

SECTION 08 11 00

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Hollow metal doors and frames, sidelight frames, and borrowed light frames.
- B. Related Sections:
 - 1. Section 08 71 00 - Door Hardware: hardware locations.
 - 2. Section 08 80 00 - Glazing: glass for doors, sidelights, and borrowed lights.
 - 3. Section 09 91 00 - Painting: finishing of hollow metal doors and frames.

1.2 SUBMITTALS

- A. Shop Drawings: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
 - 1. Include door sizes, construction, frame types, wall anchors, and accessories required for installation.
 - 2. Include cable routing diagram through hollow metal doors indicating the cable routing from the power supply to the electric hinge to the electrified locking device.

1.3 REGULATORY REQUIREMENTS

- A. Conform to applicable local building codes for fire rated requirements of metal door/metal frame and wood door/metal frame assemblies.

1.4 QUALITY ASSURANCE

- A. Standard: Provide steel doors and frames complying with the Steel Door Institute ANSI/SDI A250.8 and as herein specified. Hollow metal provider that is not a member of the Steel Door Institute is not approved and must submit product data and samples for review.
- B. Fire-Rated Door Assemblies: Provide door and frame assemblies which are identical in materials and construction to units tested in door and frame assemblies per NFPA 252 and which are labeled and listed for ratings indicated by UL. Metal UL classification markers shall be attached to these doors and frames.
 - 1. Test Pressure (positive-pressure testing): After 5 minutes into the test, the neutral pressure level in furnace shall be established at 40 inches or less above the sill.
- C. Conform to requirements of ANSI/SDI A250.8.
- D. Installed frame and door assembly to conform to UL 10C for fire-rated class indicated or scheduled.
- E. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver metal doors and frames to the project site with no dents or open seams and store upright in a protected dry area. Provide packaging and wrapping to protect hollow metal items.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Provide steel doors and frames as manufactured by one of the following:
 - Ceco Door Products; an ASSA ABLOY Group Co.
 - Curries Company; an ASSA ABLOY Group Co.
 - Deansteel Mfg., Inc.
 - Mesker Door, Inc.
 - Republic Builders Products Co.

HOLLOW METAL DOORS AND FRAMES

Steelcraft; an Allegion Co.

2.2 MATERIALS

- A. Sheet and Strip: ASTM A 1008, commercial quality, leveled, cold-rolled steel free of scale and other surface defects.

2.3 FABRICATION

- A. Flush Steel Doors: Full flush type of welded seamless construction with no visible seams or joints on faces or vertical edges.

1. Exterior Doors:

- a. Extra Heavy Duty; 0.053" thick metallic-coated steel sheet faces (16 ga.); SDI A250.8 Level 3; SDI A250.4 Performance Level A; Edge Construction Model 2 Seamless.
- b. Provide foamed-in-place polyurethane insulation with maximum U-factor of 0.61 for assembly with frame.
- c. Steel reinforced, stiffened and sound-deadened by laminating insulation completely filling the door and formed steel vertical stiffeners spaced 6" o.c. and attached to face sheets by spot welds and with the spaces between stiffeners filled with insulation material.
- d. Face: Metallic-coated steel sheet, with minimum A60 coating.

2. Interior Doors:

- a. Heavy Duty; 0.042" thick uncoated steel sheet faces (18 ga.); SDI A250.8 Level 2; SDI A250.4 Performance Level B; Edge Construction Model 2 Seamless.
- b. Steel reinforced, stiffened and sound-deadened by laminating to small cell impregnated kraft honeycomb core completely filling the door.

3. Fire Rated Doors: Provide mineral fiberboard core as scheduled and/or as required to meet applicable codes.

4. Steel thickness is thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

5. Continuous vertical interlocking joints on lock and hinge edges with seams continuously welded, filled and dressed smooth. Bevel vertical edges.

6. Top and bottom edges closed with continuous recessed steel channels spot welded to both faces. Top edge of exterior doors sealed flush with closing channel to exclude water.

7. Fixed glass moldings welded to security side of door. Loose moldings of 20 gage steel fastened with countersunk flat head screws. Fabricate stops to receive vinyl gaskets.

8. Overlapping steel astragals for pairs of labeled doors as required by manufacturer to meet codes.

- B. Steel Frames: Combination buck, frame and trim type. Provide frames with face width, throat opening, backbend, and jamb depth as per dimensions shown.

1. Exterior Frames:

- a. Extra Heavy Duty; 0.067" thick metallic-coated steel sheet (14 ga.); SDI A250.8 Level 3; SDI A250.4 Performance Level A.
- b. Continuously welded (full profile welded).
- c. Metallic-coated steel sheet with minimum A60 coating.
- d. Provide foamed-in-place polyurethane insulation with maximum U-factor of 0.61 for assembly with frame.

2. Interior Frames:

- a. Heavy Duty; 0.053" thick uncoated steel sheet (16 ga.); SDI A250.8 Level 3; SDI A250.4 Performance Level B.
- b. Continuously welded (full profile welded).

3. Brake-form to profile free of warp, buckles, and fractures with corners square and sharp. Form stop integral with frame except where detailed otherwise. Dress sheared edges straight and smooth.

4. Close corner joints tight with trim faces mitered and continuously welded. Dress exposed welds flush and smooth.

5. Fabricate frames for large openings in knocked-down sections for field assembly with butt joints and internal reinforcing sleeves. Knocked-down frame assemblies shall be trial assembled in the shop.

6. Loose glazing stops shall be 16 gage steel, mitered corners, fastened with countersunk flathead screws. Fabricate stops to receive vinyl gaskets.

7. Weld 14 gage steel floor anchors inside each jamb with two holes each anchor for floor anchor bolts.

8. Furnish frames with steel spreader temporarily fastened to the feet of both jambs for rigidity during shipping and handling.

9. For each jamb in masonry construction provide 3 or more 16 gage adjustable jamb anchors of the T-strap type spaced not more than 30" apart. Furnish yoke type Underwriters anchors for labeled door openings only.
 10. For each jamb in steel stud construction provide 4 or more 18 gage drywall type jamb anchors. Weld anchors inside each jamb and wire or bolt to the studs.
- C. Shop Finish: After fabrication, doors and frames shall be degreased, phosphatized, and factory painted inside and out with a rust inhibitive synthetic primer. Apply mineral filler to eliminate weld scars and other blemishes.
- D. Fabricate frames and doors with hardware reinforcement plates welded in place. Provide mortar guard boxes.
- E. Reinforce frames wider than 48" with roll formed steel channels fitted tightly into frame head, flush with top.
- F. Prepare frame for silencers. Provide three single rubber silencers for single doors and mullions of double doors on strike side, and two single silencers on frame head at double doors without mullions.
- G. Close top edge of exterior door flush with inverted steel channel closure. Seal joints watertight.
- H. Fabricate frames for masonry wall coursing with 2" head member.

2.4 HARDWARE PREPARATION

- A. Prepare doors and door frames for hardware. Mortising, reinforcing, drilling, and tapping shall be done at the factory for mortised hardware. Reinforcement shall be provided for surface-applied hardware, and the drilling and tapping for this hardware shall be done in the field. Provide plaster guards for hinge and strike reinforcements and cutouts on frames.
- B. Reinforcement plates in doors and frames for hardware shall be 7 gage for hinges and 12 gage for all other hardware.
- C. Punch for and install rubber silencers on all interior hollow metal door frames. Furnish 3 silencers for each single door and 2 silencers for each pair of doors. Set out and adjust strikes to provide clearance for the silencers. Omit silencers on exterior door frames.

2.5 CLEARANCES

- A. Doors shall have pre-fit clearances of:
1. At Head and Lock Stile: 1/8".
 2. At Hinge Stile: 1/16".
 3. At Door Sill:
 - a. Without Threshold: 1/8" from bottom of door to top of decorative floor finish or covering.
 - b. With Threshold: 1/8" from bottom of door to top of threshold.
 4. Between meeting edges of pair of doors: 1/8".
- B. Fitting Clearances for Fire-Rated Doors: Comply with NFPA 80. Bevel fire-rated doors 1/8" in 2" in lock edge.

2.6 ACCESSORIES

- A. Rubber Silencers: Resilient rubber.
- B. Anchors: Three per jamb, typically, of type to suit supportive construction.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify substrate conditions under provisions of SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION.

- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify surfaces and conditions are ready to receive work of this section. Notify Architect of any existing conditions which will adversely affect execution. Beginning of execution will constitute acceptance of existing conditions.

3.2 INSTALLATION

- A. Install frames in accordance with SDI-105.
- B. Install doors in accordance with DHI.
- C. Coordinate with masonry and wallboard construction for anchor placement.
- D. Coordinate installation of glass and glazing.
- E. Install doors accurately in frames, maintaining specified clearances.
- F. Setting Frames:
 - 1. Check frames for rack, twist and out-of-square, and correct.
 - 2. Set frames accurately to maintain scheduled dimensions, hold head level and maintain jambs plumb and square.
 - 3. Anchor frames securely to adjacent construction. Anchor to floor at each jamb with two bolts to prevent twist.
 - 4. Leave spreader bars in place until frames have been permanently built into the walls.
 - 5. Install fire-rated frames in accordance with NFPA 80.
- G. Hanging Doors:
 - 1. Fit and hang the doors to maintain specified door clearances. Metal hinge shims are acceptable to maintain clearances.
 - 2. Doors shall be out of wind and shall operate smoothly and quietly after adjustment.
 - 3. Place fire-rated doors with clearances as specified in NFPA 80.

3.3 TOLERANCES

- A. Maximum Diagonal Distortion: 1/8" measured with straight edge, corner to corner.

END OF SECTION

SECTION 08 14 23

PLASTIC-LAMINATE-FACED WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Solid core plastic-faced wood doors
- B. Related Sections:
 - 1. Section 08 11 00 - Hollow Metal Doors and Frames: hollow metal frames.
 - 2. Section 08 71 00 - Door Hardware: location of hardware.
 - 3. Section 12 32 16 - Manufactured Plastic-laminate-clad Casework

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings: Indicate sizes, construction, core materials, edge banding dimensions and stop profile.
- C. Product Data: Indicate door core materials and construction; type and characteristics.
- D. Samples:
 - 1. Submit a sample, 6" by 6", of each plastic laminate finish and color selected.
 - 2. Submit a 12" x 12" sample of solid core door panel indicating construction, core, face and edge detail.
 - 3. Submit 8-1/2" x 11" paint color samples of door glazing frame paint.
- E. Certificates: Submit certification that doors comply with reference standards fabrication requirements, signed by authorized representative of door manufacturer.

1.3 QUALITY ASSURANCE

- A. Standard: Comply with the requirements of "Architectural Woodwork Quality Standards, Guide Specifications and Quality Certification Program" as published by Architectural Woodwork Institute.
- B. Color Uniformity: Provide plastic laminate for casework from the same manufacturer.
- C. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.4 DELIVERY

- A. Deliver doors to the project site ready for installation and to receive hardware. Each unit shall be individually plastic wrapped at the factory for protection in transit and storage.

1.5 WARRANTY

- A. Special Warranty: Provide Life-of-Installation warranty on manufacturer's standard form, signed by manufacturer, installer, and contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship or have warped (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section. Warranty shall specifically include installation of replacement doors required during term of the warranty.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Provide plastic laminate faced wood doors as manufactured by one of the following:

Marshfield-Algoma (Masonite Architectural)

Oregon Door

VT Industries, Inc./Eggers Industries, Architectural Door Div.

2.2 MATERIALS AND FABRICATION

- A. Flush Doors: Premium Grade, PC-HPDL-3 (3-ply), as defined in Section 9 of AWI Quality Standards.
 - 1. Core: Particleboard meeting ANSI A 208.1, Grade LD-2, Urea-Formaldehyde Free.
 - 2. Faces: HGS (nominal 0.048") high pressure decorative laminated plastic conforming to NEMA LD 3. Laminate to be bonded to both faces. Fire-rated plastic laminate faced wood doors shall be surfaced with fire-rated (UL Stamped) laminated plastic sheet. Color shall be as selected by Architect from manufacturer's full color and pattern range. Product/manufacturer; one of the following:
 - Formica Brand Laminate; Formica Corp.
 - Pionite or Nevamar; Panolam Industries
 - Wilsonart; Wilsonart LLC
- B. Fitting:
 - 1. Cutouts for mortise hardware shall be made to template at the factory.
 - 2. Top and bottom rail edges and core exposed by cutouts for hardware shall be factory sealed.

2.3 ADHESIVE

- A. Facing Adhesive: Type I - waterproof.

2.4 FABRICATION

- A. Fabricate non-rated doors in accordance with AWI Quality Standards requirements.
- B. Bond edge banding to cores.
- C. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware. Provide solid blocking for through-bolted hardware.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify frame opening conditions under provisions of SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.2 PREPARATION

- A. Condition plastic faced wood doors to the average prevailing humidity in the building prior to fitting and hanging.

3.3 INSTALLATION

- A. General: Installation of doors shall comply with the applicable requirements of Section 1700 Installation of Architectural Woodwork (Interior) of the AWI Quality Standards.
- B. Hang doors to maintain uniform clearances. Doors shall be out of wind and shall operate smoothly and quietly after adjustment. Replace doors damaged during installation.
- C. Cutting and fitting of plastic laminate faced doors at the project site will not be permitted. Doors which do not fit properly shall be replaced.

- D. Pilot drill screw and bolt holes.
- E. Machine cut for hardware. Core for handsets and cylinders.
- F. Coordinate installation of doors with installation of frames specified in SECTION 08 11 00 - HOLLOW METAL DOORS AND FRAMES and hardware specified in SECTION 08 71 00 - DOOR HARDWARE.
- G. Coordinate installation of glass and glazing.

3.4 INSTALLATION TOLERANCES

- A. Conform to AWI requirements for fit and clearance tolerances.
- B. Maximum Diagonal Distortion (Warp): 1/8" measured with straight edge or taut string, corner to corner, over an imaginary 36" x 84" surface area.
- C. Maximum Vertical Distortion (Bow): 1/8" measured with straight edge or taut string, top to bottom, over an imaginary 36" x 84" surface area.
- D. Maximum Width Distortion (Cup): 1/8" measured with straight edge or taut string, edge to edge, over an imaginary 36" x 84" surface area.

3.5 ADJUSTING

- A. Adjust work under provisions of SECTION 01 77 00 - CLOSEOUT PROCEDURES.
- B. Adjust door for smooth and balanced door movement.

END OF SECTION

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SECTION 08 33 13

COILING COUNTER DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Coiling counter doors.
- B. Related Sections:
 - 1. Section 08 71 00 - Door Hardware: cylinders for coiling door lock and key switch.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES
- B. Product Data: Submit manufacturer's product data and installation instructions for each type of coiling counter door. Include both published data and any specific data prepared for this project.
- C. Shop Drawings: Submit shop drawings for approval prior to fabrication. Include detailed plans, elevations, details of framing members, required clearances, anchors and accessories. Include relationship with adjacent materials.

1.3 QUALITY ASSURANCE

- A. Labeled Construction: Door and frame shall be manufactured in accordance with specifications and procedures for doors and frames tested and rated by Underwriter's Laboratories, Inc. Metal UL classification markers shall be attached to door and frame.

PART 2 - PRODUCTS

2.1 COILING COUNTER DOORS

- A. Face-of-Wall Mounted coiling door to detail. Product/manufacturer; one of the following:
 - ESC10; Cornell/Cookson, LLC.
 - DuraShutter Select; Raynor
 - 651 Series; Overhead Door Corp.
 - Model 520; Wayne-Dalton Commercial Rolling Doors; Div. Overhead Door Corp.
 - Model 8325; Windsor Republic Door
- B. Curtain: Constructed of interlocking, roll-formed, flat-face stainless steel slats similar to Overhead Door Flat Type F-128 and equipped with a tubular steel bottom bar for reinforcement. All slats shall have malleable iron end locks to act as wearing surfaces in the guides.
- C. Guides: Box type fabricated of stainless steel angles and channels.
- D. Roller Shaft: Steel pipe with cast iron end plugs and containing an oil tempered, helical counterbalancing steel spring with external adjustment by means of a wheel.
- E. Brackets: Heavy cast iron or steel designed to form end closure supports for the hood. Roller shaft ends shall be journaled into bracket hubs and fitted with self-lubricating bronze bearings or sealed ball bearings.
- F. Hood: Not less than 20-gage stainless steel formed to fit the contour of the end brackets and reinforced with stiffening rolls at top and bottom edges.
- G. Operation: Door shall be counterbalanced for ease of manual push-up operation.
- H. Locking: Provide cylinder locks on bottom bar less cylinder for key operation.

- I. Finish: The stainless curtain slats, guides, and hood shall have a No. 4 finish. All other exposed metal parts shall have a shop coat of rust inhibitive paint.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Coiling counter door shall be installed by skilled mechanics supervised by the manufacturer's authorized representative.
- B. Erect the door, guides, and accessories in a rigid substantial manner, straight and plumb, and with horizontal lines level.

3.2 ADJUSTING

- A. Adjust the door and operators and leave in good working order.

END OF SECTION

SECTION 08 33 23

OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Insulated coiling doors.
- B. Related Sections:
 - 1. Section 05 50 00 - Metal Fabrications: steel frames for coiling door openings.
 - 2. Section 08 71 00 - Door Hardware: cylinders.

1.2 SUBMITTALS

- A. Shop Drawings: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. Include installation details and operating procedures.

1.3 QUALITY ASSURANCE

- A. Wind Load: Exterior coiling doors shall be constructed to safely resist uniform pressure (velocity pressure) of 22 psf.
- B. Labeled Construction: Doors required by schedule to be labeled shall be manufactured in accordance with specifications and procedures for doors tested and rated by Underwriter's Laboratories, Inc. Metal UL classification markers shall be attached to these doors.

PART 2 - PRODUCTS

2.1 INSULATED COILING DOORS

- A. Basis of Design: Provide "Thermiser Max ESD30" face-of-wall mounted insulated coiling door as manufactured by Cornell/Cookson/Clopay, LLC or approved equivalent. Door shall meet 2021 IECC criteria.
 - 1. Operation: Motor operator.
 - a. Motor:
 - 1) Provide high starting torque motor, including motor/gearing cover and spring adjustor cover, of the size and design as recommended by door manufacturer, reduction gearing, solenoid brake, limit switches, emergency hand chain with electrical interlock, magnetic relay contactor, overload protection, prewiring to terminal block, stoplock safety bearing to prevent doors from falling in event of motor damage.
 - 2) 208 V, 3 phase, 60 Hz.
 - 3) Provide key operated control switch.
 - 4) Motor operator shall be equipped with monitored wireless safety edge in conjunction with the door operator control.
 - 2. Curtains:
 - a. Flat-faced, insulated, interlocking slats cold roll formed of galvanized steel.
 - b. End of alternate slats to be fitted with malleable iron endlocks.
 - c. Slat design shall satisfy a windload of 20 psf.
 - d. Curtain to be reinforced with bottom bar consisting of two angles of galvanized steel. Install weatherseal on bottom of bars.
 - e. Door shall meet 2021 IECC requirement of 0.31 max U-Value for opaque doors.
 - f. Backing slats of galvanized steel.
 - 3. Spring Counterbalance:
 - a. House in steel pipe of diameter and wall thickness to restrict maximum deflection to 0.03" per foot of door width.
 - b. Springs to be helical torsion type.
 - c. Spring tension to be adjustable by means of external adjustment wheel.
 - 4. Brackets:
 - a. Fabricate from minimum 3/16" steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures.

- b. Doors shall not rattle in wind.
 - c. Finish: Powder Coat: Zirconium treatment followed by a gray baked-on polyester powder coat; minimum 2.5 mils cured film thickness.
- 5. Guides:
 - a. Structural galvanized steel angles of 3/16" min. thickness.
 - b. Fit guides with two flexible weathering strips (both sides). Door shall not rattle in wind.
- 6. Guide Seal (Thermal Break): Foam block to seal the area between the outer angle and wall angle if an "E" guide is used and outer guide angle and the wall if a "Z" guide is used.
 - a. Foam Block: Compression fit F3061 foam block, EPDM, closed cell, low density
 - 1) Meets ASTM D 1056 2A1 requirements.
 - 2) 2A1 foam shall be closed cell, non-oil resistant EPDM, with a 2-5psi.
 - 3) UL listed for gasket and seal.
 - 4) Service temperature of -103 deg F to 220 Deg F.
- 7. Hoods:
 - a. Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head when not concealed in ceiling. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face.
 - b. Fabricated of galvanized steel sheet metal no lighter than 24 gage, laterally reinforced.
 - c. Provide intermediate hood supports for hoods exceeding 16'-0".
 - d. Fit with internal neoprene header weather baffle.
 - e. Fit entire length of hood with internal 4" brush seal with aluminum retainer to act as wind baffle. Door shall not rattle in wind.
- 8. Locks:
 - a. Provide cylinder locks on bottom bars less standard cylinder for key operation. Cylinder locking for motor operated doors to include electrical interlock to prevent operation before door is unlocked.
- 9. Finish:
 - a. Galvanized Surfaces:
 - 1) Base Coat: ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding, gray baked-on base coat and gray baked-on polyester finish coat.
 - 2) Finish Coat: Zirconium treatment followed by baked-on polyester powder coat, with color as selected by Architect; minimum 2.5 mils cured film thickness; ASTM D-3363 pencil hardness: H or better.
 - b. Ungalvanized Surfaces: Shop coat of rust inhibiting metallic primer.
- 10. Weatherstripping: Door to be fully weatherstripped at sill, hood, and at guides.
 - a. Bottom Bar:
 - 1) Motor Operated Doors: Sensing/weather edge with neoprene astragal extending full width of door bottom bar
 - b. Guides: Replaceable vinyl strip on guides sealing against fascia side of curtain
 - c. Lintel Seal: Double brush seal with EPDM sandwiched between the two brush seals at door header to impede air flow.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Coiling doors shall be installed by skilled mechanics supervised by the manufacturer's authorized representative.
- B. Erect the doors, guides, and accessories in a rigid substantial manner, straight and plumb, and with horizontal lines level.

3.2 TESTING AND ADJUSTING

- A. Upon completion of installation, put all items through at least ten operating cycles. Make required adjustments and assure that components are in optimum operating condition.

END OF SECTION

SECTION 08 41 13

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Aluminum entrance and storefront systems with associated aluminum doors.
- B. Related Sections:
 - 1. Section 07 92 00 - Joint Sealants: caulking of perimeter joints.
 - 2. Section 08 71 00 - Door Hardware; hardware for aluminum doors.
 - 3. Section 08 80 00 - Glazing.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings: Include drawings showing elevations of each entrance and storefront type, detail sections of typical composite members, and glazing details.
- C. Samples: Submit for approval duplicate samples showing the limits of color range to which the entrance, storefront, and door materials will be processed. Samples shall be representative of the materials to be furnished, and the color of the installed materials shall be within the range of the approved samples.
- D. Verify that field measurements are as indicated on shop drawings and as instructed by the manufacturer.

1.3 SYSTEM DESCRIPTION AND PERFORMANCE

- A. Architectural Requirements
 - 1. Drawings are diagrammatic and do not purport to identify or solve problems of thermal or structural movement, glazing or anchorage.
 - 2. Requirements shown by details are intended to establish basic dimensions of units, sightlines and profiles of members.
 - 3. Provide concealed fastening wherever possible.
 - 4. Provide continuous snap-in thermally-broken aluminum backer plate at head and jamb conditions.
- B. Structural Requirements
 - 1. System to provide for expansion and contraction within system components caused by a cycling temperature range of 170°F. without causing detrimental effects to system or components.
 - 2. Design and size members to withstand dead loads and live loads caused by pressure and suction of wind as calculated in accordance with building code, and measured in accordance with ANSI/ASTM E 330.
 - 3. Limit mullion deflection to L/175, or flexure limit of glass with full recovery of glazing materials, whichever is less.
 - 4. System to accommodate, without damage to system or components, or deterioration of perimeter seal: Movement within system; movement between system and perimeter framing components; dynamic loading and release of loads; and deflection of structural support framing.
 - 5. Storefront manufacturer shall be responsible for design and engineering of storefront system, including necessary modifications to meet specified requirements and maintaining visual design concepts.
 - 6. Attachment considerations shall take into account site peculiarities and expansion and contraction movements so there is no possibility of loosening, weakening or fracturing connection between units and building structure or between units themselves.
 - 7. Design anchors, fasteners and braces to be structurally stressed not more than 50% of allowable stress when maximum loads are applied.
 - 8. Engineer storefront and entrances to be free from rattles, wind whistles and noise due to thermal and structural movement and wind pressure.

C. Environmental Requirements

1. Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior. No leakage shall occur in wall when tested in accordance with ASTM E 331 at test pressure of 6.24 lbs/sq ft.
2. Limit air infiltration through assembly to 0.06 cu ft/min/sq ft of assembly surface area, measured at a reference differential pressure across assembly of 1.57 lbs/sq ft. as measured in accordance with ANSI/ASTM E 283.
3. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor maximum of 0.46 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
4. Maintain continuous air and vapor barrier throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

1.4 QUALITY ASSURANCE

- A. Erector Qualifications: Erection of the entrance and storefront systems and doors shall be by an experienced erector approved by the manufacturer.
- B. Design Criteria:
1. Deflection of glass framing members under design loads shall not exceed $L/175$ or $\frac{3}{4}$ ", whichever is less.
 2. Deadload deflection of horizontal glass framing members shall not exceed 0.125".
 3. Exterior Entrances and Storefront: Design windload shall be 22 psf.
- C. Perform work in accordance with AAMA SFM-1 and AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and handle system components under provisions of SECTION 01 65 00 - PRODUCT DELIVERY REQUIREMENTS.
- B. Store and protect system components under provisions of SECTION 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS.
- C. Provide wrapping to protect prefinished aluminum surfaces.

1.6 COORDINATION

- A. Manufacturer shall be responsible for details and dimensions not controlled by job conditions and shall show on his shop drawings required field measurements beyond his control.
- B. Coordinate with responsible trades to establish, verify and maintain field dimensions and job conditions.

1.7 ENVIRONMENTAL CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40°F. during and 48-hours after installation.

1.8 WARRANTY

- A. Special Assembly Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of aluminum-framed systems that do not comply with requirements or that deteriorate within specified warranty period.
1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Noise or vibration caused by thermal movements.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - d. Water leakage through fixed glazing and framing areas.
 - e. Failure or operating components to function properly.
 2. Warranty Period: 2 years from date of substantial completion.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Provide aluminum entrances and storefronts as manufactured by one of the following:
 - EFCO Corp.
 - Kawneer North America
 - Oldcastle Building Envelope
 - Tubelite, Inc
 - YKK AP America, Inc.

2.2 MATERIALS

- A. Extruded Aluminum: ASTM B 221; AA 6063-T5 alloy, temper.
- B. Sheet Aluminum: ASTM B 209; 5005-H34 alloy, temper; or other alloys and temper recommend by manufacturer appropriate for specified finish.
- C. Sheet Steel: ASTM A 446; hot-dipped galvanized.
- D. Steel Sections: ASTM A 36; shapes to suit mullion sections.
- E. Primer and Touch-Up Primer for Galvanized Surfaces: High-zinc-dust-content paint complying with SSPC-Paint 20.
- F. Fasteners: Stainless steel.

2.3 FABRICATED COMPONENTS

- A. General: Form section true to details with clean, straight, sharply defined profiles, free from defects impairing strength or durability.
- B. Framing:
 - 1. Framing Types Basis of Design shall be Tubelite:
 - a. Exterior: Provide the following thermally broken framing systems where shown on drawings.
 - 1) 2" x 6-1/2" Framing System: Tubelite T24650 Series
 - b. Interior: Provide the following framing systems where shown on drawings.
 - 1) 1-3/4" x 4-1/2" Framing System: Tubelite 4500 Series
 - 2. Fabricate the aluminum entrance and storefront systems with the shapes and sections detailed.
 - 3. Design the glass framing system to minimize loads on the glass due to building movement and incorporate provisions for thermal expansion by means of expansion joints. Where insulating glass is to be installed, design the glass framing system so that moisture does not accumulate in the glazing channel for prolonged periods.
 - 4. Construction: Mill joints to a hairline fit. Assemble and connect members to form rigid, watertight assemblies. No exposed fastenings will be permitted. Reinforce the framing internally as required to meet the design criteria specified above.
 - 5. Continuous Solid Closures: Fabricate required closures and covers to detail of aluminum sheet, plate, and angles. Provide solid continuous thermally-broken backer plate closures at head and all jams.
 - 6. Accessories: Provide glazing gaskets, flashing, and miscellaneous shims and other parts detailed or otherwise required to complete the work.
 - 7. Provide manufacturer's standard closure plate at perimeter framing members to cover open side of framing member against surrounding construction.
- C. Doors: Tubelite Monumental Doors and Monumental Frames. The aluminum doors shall be wide-stile type with 5" stiles, 6-1/2" top rail, 5" intermediate rail (centered on panic device) and 10" bottom rail; plus square glazing stops. Construction: Doors shall be mortised and have reinforced welded corner construction with hairline watertight joints. Fastenings shall be concealed.
 - 1. Doors shall be factory fabricated by aluminum entrance and storefront manufacturer.
 - 2. Glazing Beads: Fixed or theft proof snap-in glazing beads on exterior or security side of doors. Interior glazing beads shall be snap-in type. All glazing beads shall have vinyl inserts and glazing gaskets.
 - 3. Weatherstripping: Continuous contact weatherstripping on stiles and top rails of exterior doors.
- D. Hardware Preparation: Prepare and reinforce doors and door frames for hardware.

1. Mortising, reinforcing, drilling, and tapping for mortised hardware shall be done at the factory.
 2. Wherever possible, concealed steel reinforcement for surface-applied hardware shall be installed at the factory. The drilling and tapping for surface-applied hardware shall be done in the field.
- E. Reinforced Mullion: Same profile as non-reinforced frames, of extruded aluminum cladding with internal reinforcement of steel shaped structural section.
- F. Flashings:
1. Form from sheet aluminum with same finish as extruded sections. Apply finish after fabrication. Material thickness as required to suit condition without deflection or "oilcanning"; of proper alloy to match the finished extrusions.
 2. Subsill Flashing: Provide manufacturer's standard high-performance, thermally-broken aluminum subsill flashing with integral weep holes. End dams shall be manufacturer's standard fiberglass, plastic or thermally-broken aluminum end dams.
- G. Extruded Aluminum:
1. Framing System: Principal extrusions shall have a minimum wall thickness of 0.08". Moldings, trim, and glass stops shall be not less than 0.050" thick.
 2. Doors and Door Framing System: Principal extrusions shall have a minimum wall thickness of 3/16". Moldings, trim, and glass stops shall be not less than 0.050" thick.
- H. Reinforcement: Concealed reinforcements for hardware in doors and frames and mullions shall be plated or galvanized steel and shall be secured in place. If Monumental doors are not specified, then provide continuous reinforcement at continuous geared hinges.
- I. Fabricate doors and frames allowing for minimum clearances and shim spacing around perimeter of assembly, yet enabling installation.
- J. Rigidly fit and secure joints and corners with internal reinforcement, except that door corners will be welded. Make joints and connections flush, hairline, and weatherproof.
- K. Develop drainage holes with moisture pattern to exterior.
- L. Prepare components to receive anchor devices. Fabricate anchorage items.
- M. Arrange fasteners, attachments, and jointing to ensure concealment from view.
- N. Prepare components with internal reinforcement for door hardware.
- O. Reinforce framing members for imposed loads.

2.4 HARDWARE

- A. Weatherstripping: Provide Kawneer's Polymeric Sealair Weathering System or approved equivalent, continuous at head, jamb, sill, and meeting stile.
- B. Refer to SECTION 08 71 00 - DOOR HARDWARE for balance of hardware.

2.5 FINISHES

- A. Finish coating to conform to AAMA 611. Finish for aluminum entrances, storefronts, frames, doors and curtain wall shall match.
- B. Aluminum Finish: Exposed aluminum surfaces of entrances, storefronts, frames, doors and curtain wall and all their associated parts shall be Architectural Class I AA-M10C22A44 Hard Coat Color Anodic Coating Dark bronze color, .7 mil minimum. Screw and bolt heads exposed to view shall be finished to match the exposed aluminum surfaces.
- C. Concealed Steel Items: Galvanized in accordance with ANSI/ASTM A 123 to 2.0 oz/sq ft.
- D. Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine areas to receive entrances and storefronts for conditions that will adversely affect the execution and quality of work. Do not start this work until unsatisfactory conditions are corrected.
- B. Field check dimensions, elevations, and slopes on the connecting work affecting the entrance and storefront to assure a proper fit and weathertight installation.
- C. Verify that field measurements are as indicated on shop drawings and as instructed by the manufacturer.

3.2 INSTALLATION

- A. Install wall system, doors, and glazing in accordance with manufacturer's instructions and AAMA - Metal Curtain Wall, Window.
- B. Erecting Storefronts: Erect the members to be plumb, level, square and in proper alignment with other work, and free from sags, waves and buckles.
 - 1. Materials shall be accurately cut and fitted and rigidly anchored in place to resist safely all normal stresses to which the work will be subjected.
 - 2. Cut and machined ends and recesses shall be true, accurate and free of burrs and rough edges.
 - 3. Provide subsill extrusions positioned to collect water leakage through mullions and storefront. Subsill shall drain to the exterior. It shall run continuously across the opening width. The ends are sealed with end dams.
 - 4. Create end dams at ends of window heads, sills, at edges of storefronts, and other vertical elements to channel water to nearest weep hole away from window mullions and other items which might allow water to travel vertically.
 - 5. Provide clearance around the perimeter between entrance and storefront metal and the opening substrate (concrete or masonry) for caulking.
- C. Hanging Doors: Fit the doors with hardware and hang to operate smoothly, without bind or chatter.
 - 1. Where concealed reinforcement for hardware cannot be provided, install and use Riv-Nuts for fastening surface applied hardware.
 - 2. Use sex bolts and nuts for fastening closers and closer arms to aluminum doors.
 - 3. The use of sheet metal or self-tapping screws to mount hardware is prohibited.
- D. Sealing Joints: Seal the metal-to-metal framing joints properly in conformance with the manufacturer's standard procedure.
- E. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- F. Install hardware using templates provided. Refer to SECTION 08 71 00 - DOOR HARDWARE for installation requirements.
- G. Install glass and infill panels in accordance with SECTION 08 80 00 - GLAZING, using exterior dry method of glazing.
- H. Install perimeter 2 part polyurethane type sealant, backing materials, and installation requirements in accordance with SECTION 07 92 00 - JOINT SEALANTS.

3.3 TOLERANCES

- A. Maximum Variation from Plumb: 0.06" every 3' non-cumulative or 1/16" per 10', whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32".

3.4 ADJUSTING

- A. Adjust operating hardware for smooth operation.

3.5 PROTECT AND CLEAN

- A. Protection of Aluminum:
 - 1. Protect concealed aluminum surfaces that will contact masonry, concrete and steel with neoprene gaskets or a coat of bituminous paint to prevent galvanic and corrosive action.
 - 2. If drainage of moisture from incompatible metal passes over aluminum, paint the incompatible metal with a coat of aluminum pigmented paint.
 - 3. Protect finished aluminum surfaces from staining by gypsum and cement materials until all adjacent masonry and plaster work has been completed.
- B. Cleaning: Upon completion of the work, wash down aluminum surfaces with water and soft cloths and leave in first class condition.

END OF SECTION

SECTION 08 71 00 - DOOR HARDWARE

PART 1 - GENERAL

1.01 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 "General Requirements" sections for Allowances, Alternates, Owner Furnished Contractor Installed, Project Management and Coordination.
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 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
7. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

1.02 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

1.03 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
 - a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
 - b. 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. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
 - a. Wiring Diagrams: For power, signal, and control wiring and including:
 - 1) Details of interface of electrified door hardware and building safety and security systems.
 - 2) Schematic diagram of systems that interface with electrified door hardware.
 - 3) Point-to-point wiring.
 - 4) Risers.
3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.
 - a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.

4. 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 under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) 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.
 5. 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.

1.04 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.

1.05 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.

1.06 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.

1.07 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
 - a) Schlage L Series: 10 years
 - 2) Exit Devices
 - a) Von Duprin: 10 years
 - 3) Closers
 - a) LCN 4000 Series: 30 years
 - b) LCN 1460 Series: 30 years
 - b. Electrical Warranty
 - 1) Locks
 - a) Schlage: 3 years
 - 2) Exit Devices
 - a) Von Duprin: 3 years

1.08 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

2.01 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" or "Acceptable Manufacturers" 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 from manufacturers indicated in "Acceptable Manufacturers" 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.

2.02 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.
- C. Cable and Connectors:
 - 1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
 - 2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.

3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

2.03 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Ives 5BB series
2. Acceptable Manufacturers and Products:
 - a. No Substitute

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. 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
5. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
6. 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.
7. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
 - a. Steel Hinges: Steel pins
 - b. Non-Ferrous Hinges: Stainless steel pins
 - c. Interior Non-lockable Doors: Non-rising pins
8. 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.

2.04 CONTINUOUS HINGES

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. No Substitute

B. Requirements:

1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
2. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.

3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
4. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
5. On fire-rated doors, provide aluminum geared continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
6. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.

2.05 ELECTRIC POWER TRANSFER

A. Manufacturers:

1. Scheduled Manufacturer and Product:
 - a. Von Duprin EPT-10
2. Acceptable Manufacturers and Products:
 - a. No Substitute

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.

2.06 FLUSH BOLTS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. No Substitute

B. Requirements:

1. Provide automatic, constant latching, and manual flush bolts with forged bronze or stainless-steel face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch (305 mm) steel or brass rods at doors up to 90 inches (2286 mm) in height. For doors over 90 inches (2286 mm) in height increase top rods by 6 inches (152 mm) for each additional 6 inches (152 mm) of door height. Provide dust-proof strikes at each bottom flush bolt.

2.07 COORDINATORS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
 2. Acceptable Manufacturers:
 - a. No Substitute
- B. Requirements:
1. Where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors, provide bar-type coordinating device, surface applied to underside of stop at frame head.
 2. Provide filler bar of correct length for unit to span entire width of opening, and appropriate brackets for parallel arm door closers, surface vertical rod exit device strikes, or other stop mounted hardware. Factory-prepared coordinators for vertical rod devices as specified.

2.08 MORTISE LOCKS

- A. Manufacturers and Products:
1. Scheduled Manufacturer and Product:
 - a. Schlage L9000 series
 2. Acceptable Manufacturers and Products:
 - a. 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 2-3/5-inch x 3/5 inch with 180-degree visibility. Provide messages color-coded using ANSI Z535 Safety Red with full text and/or symbols, as scheduled, for easy visibility. When applicable allows for lock status indication on both sides of the door.
 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 where specified for exterior applications.
 - b. Lever Design: 07B.

2.09 EXIT DEVICES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Von Duprin 98/35A series
2. Acceptable Manufacturers and Products:
 - a. 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 smooth 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.
17. Special Options:
 - a. XP
 - 1) Rim Exit Devices: provide devices with non-tapered smart latchbolt with 90° latchbolt to strike engagement under stress and Static Load Resistance of 2000 pounds.

2.10 POWER SUPPLIES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Schlage/Von Duprin PS900 Series
2. Acceptable Manufacturers and Products:
 - a. No Substitute

B. Requirements:

1. Provide power supplies approved by manufacturer of supplied electrified hardware.
2. Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.
3. Provide regulated and filtered 24 VDC power supply, and UL class 2 listed.
4. Provide power supplies with the following features:
 - a. 12/24 VDC Output, field selectable.
 - b. Class 2 Rated power limited output.
 - c. Universal 120-240 VAC input.
 - d. Low voltage DC, regulated and filtered.
 - e. Polarized connector for distribution boards.
 - f. Fused primary input.
 - g. AC input and DC output monitoring circuit w/LED indicators.
 - h. Cover mounted AC Input indication.
 - i. Tested and certified to meet UL294.
 - j. NEMA 1 enclosure.
 - k. Hinged cover w/lock down screws.
 - l. High voltage protective cover.

2.11 CYLINDERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Schlage Everest 29 Primus XP
2. Acceptable Manufacturers and Products:
 - a. 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. High Security: dual-locking cylinder with permanent core requiring restricted, patented keyway. Dual-locking mechanism with interlocking finger pin(s) to check for patented features on keys.

3. Patent Protection: Cylinders/cores requiring use of restricted, patented keys, patent protected.
4. Nickel silver bottom pins.

2.12 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 biting list and keys separately from cylinders, by means as directed by Owner - include digital copy. 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 (sequentially numbered) 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.

2.13 KEY CONTROL SYSTEM

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Telkee
2. Acceptable Manufacturers:
 - a. HPC
 - b. Lund

B. 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.

2.14 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. LCN 4040XP series
2. Acceptable Manufacturers and Products:
 - a. 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.
11. Closers shall be capable of being upgraded by adding modular mechanical or electronic components in the field.

2.15 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. LCN 1460 series
2. Acceptable Manufacturers and Products:
 - a. No Substitute

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory.
2. Provide door closers with fully hydraulic, full rack and pinion action cast iron cylinder.
3. Closer Body: 1-1/4-inch (32 mm) diameter, with 5/8-inch (16 mm) diameter heat-treated pinion journal.
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.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and backcheck.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. 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.

2.16 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. No Substitute

B. Requirements:

1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

2.17 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
 2. Acceptable Manufacturers:
 - a. No Substitute
- 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. Size 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.

2.18 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

- A. Manufacturers:
1. Scheduled Manufacturers:
 - a. Glynn-Johnson
 2. Acceptable Manufacturers:
 - a. ABH (Provide where specified)
- B. Requirements:
1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.

2.19 DOOR STOPS AND HOLDERS

- A. Manufacturers:
1. Scheduled Manufacturer:
 - a. Ives
 2. Acceptable Manufacturers:
 - a. No Substitute
- 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.

2.20 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

- A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Zero International
2. Acceptable Manufacturers:
 - a. No Substitute

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.

2.21 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. No Substitute

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.

2.22 DOOR POSITION SWITCHES

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Schlage
2. Acceptable Manufacturers:
 - a. No Substitute

B. Requirements:

1. Provide recessed or surface mounted type door position switches as specified.
2. Coordinate door and frame preparations with door and frame suppliers. If switches are being used with magnetic locking device, provide minimum of 4 inches (102 mm) between switch and magnetic locking device.

2.23 FINISHES

A. FINISH: BHMA 626/652 (US26D); EXCEPT:

1. Hinges at Exterior Doors: BHMA 630 (US32D)
2. Aluminum Geared Continuous Hinges: BHMA 628 (US28)
3. Push Plates, Pulls, and Push Bars: BHMA 630 (US32D)
4. Protection Plates: BHMA 630 (US32D)
5. Overhead Stops and Holders: BHMA 630 (US32D)
6. Door Closers: Powder Coat to Match
7. Wall Stops: BHMA 630 (US32D)
8. Latch Protectors: BHMA 630 (US32D)
9. Weatherstripping: Clear Anodized Aluminum
10. Thresholds: Mill Finish Aluminum

PART 3 - EXECUTION

3.01 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.

3.02 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. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:
 - 1. Conduit, junction boxes and wire pulls.
 - 2. Connections to and from power supplies to electrified hardware.
 - 3. Connections to fire/smoke alarm system and smoke evacuation system.
 - 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
 - 5. Connections to panel interface modules, controllers, and gateways.
 - 6. Testing and labeling wires with Architect's opening number.
- K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- L. Continuous Hinges: Re-locate the door and frame fire rating labels where they will remain visible so that the hinge does not cover the label once installed.
- M. 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.
- N. Overhead Stops/Holders: Mount overhead stops/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- O. 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.
- P. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- Q. 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.
- R. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- S. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

- T. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

3.03 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. Spring Hinges: Adjust to achieve positive latching when door can close freely from an open position of 30 degrees.
 - 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 - 3. 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.

3.04 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.

3.05 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:

125964 OPT0407770 VERSION 2

HARDWARE GROUP NO. 001

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	MORTISE CYLINDER	TYPE AS REQ W/KEYED CONST. CORE (AS REQ)	626	SCH
1	EA	PRIMUS CORE NOTE	20-740-XP CKC BALANCE OF HARDWARE BY DOOR MFR	626	SCH

-COORDINATE HARDWARE REQUIREMENTS WITH DOOR MANUFACTURER PRIOR TO SUBMITTALS.

-REMOVE CYLINDER AND CORE IF NOT REQUIRED.

HARDWARE GROUP NO. 200EP

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 (PROVIDE NRP @ OUTSWING, LOCKABLE DOORS)	652	IVE
1	SET	AUTO FLUSH BOLT	FB31P/FB41P AS REQ	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	L9080T 07B	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	COORDINATOR	COR X FL X MB X HW PREPS	628	IVE
2	EA	SURFACE CLOSER	1461 RW/PA TBWMS X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	ARMOR PLATE	8400 34" X 1" LDW B-CS (PROVIDE 8402 @ FIRE RATED OPENINGS)	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS) (PERIMETER SEAL BY ALF MFR @ ALF)	BK	ZER
1	SET	MEETING STILE	8193AA (2 PCS - 1 SET) (OMIT @ NON-RATED DOORS)	AA	ZER

-DOORS TO SWING 180 DEGREES.

HARDWARE GROUP NO. 200P

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 (PROVIDE NRP @ OUTSWING, LOCKABLE DOORS)	652	IVE
1	SET	AUTO FLUSH BOLT	FB31P/FB41P AS REQ	630	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	L9080T 07B	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	COORDINATOR	COR X FL X MB X HW PREPS	628	IVE
2	EA	SURFACE CLOSER	1461 RW/PA TBWMS X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	ARMOR PLATE	8400 34" X 1" LDW B-CS (PROVIDE 8402 @ FIRE RATED OPENINGS)	630	IVE
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS) (PERIMETER SEAL BY ALF MFR @ ALF)	BK	ZER
1	SET	MEETING STILE	8193AA (2 PCS - 1 SET) (OMIT @ NON-RATED DOORS)	AA	ZER

HARDWARE GROUP NO. 201

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 (PROVIDE NRP @ OUTSWING, LOCKABLE DOORS)	652	IVE
1	EA	STOREROOM LOCK	L9080T 07B	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	SURFACE CLOSER	1461 RW/PA TBWMS X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS (OMIT @ HMD)	630	IVE
1	EA	WALL STOP	WS406/407CCV (OMIT @ PROVIDE FLOOR STOP WHERE REQ)	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS) (PERIMETER SEAL BY ALF MFR @ ALF)	BK	ZER

HARDWARE GROUP NO. 201AC

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	STOREROOM LOCK	L9080T 07B	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	SURFACE CLOSER	1461 SCUSH TBWMS X MTG	689	LCN
1	SET	SEAL	BRKT, SPCR & PLATE AS REQ PERIMETER SEAL BY FRAME MFR		

-VERIFY ALUMINUM DOOR IS WIDE STILE.

-5" STILE IS REQUIRED FOR THE SPECIFIED HARDWARE, COORDINATE WITH DOOR
MFR./SUPPLIER.

HARDWARE GROUP NO. 201C

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 (PROVIDE NRP @ OUTSWING, LOCKABLE DOORS)	652	IVE
1	EA	STOREROOM LOCK	L9080T 07B	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	SURFACE CLOSER	1461 SCUSH TBWMS X MTG	689	LCN
1	EA	KICK PLATE	BRKT, SPCR & PLATE AS REQ 8400 10" X 2" LDW B-CS (OMIT @ HMD)	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS) (PERIMETER SEAL BY ALF MFR @ ALF)	BK	ZER

HARDWARE GROUP NO. 203S

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 (PROVIDE NRP @ OUTSWING, LOCKABLE DOORS)	652	IVE
1	EA	STOREROOM LOCK	L9080T 07B	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	OH STOP	900S SERIES X SIZE & MTG AS REQ (OMIT & PROVIDE WALL/FLOOR STOP WHERE POSSIBLE)	630	GLY
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS) (PERIMETER SEAL BY ALF MFR @ ALF)	BK	ZER

HARDWARE GROUP NO. 205

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224XY	628	IVE
1	EA	VANDL STOREROOM LOCK	LV9080T 07B	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBWMS X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS (OMIT @ HMD)	630	IVE
1	EA	RAIN DRIP	142AA DW + 4" (OMIT @ COVERED OPENINGS)	AA	ZER
1	SET	GASKETING	328AA H & J	AA	ZER
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER

-NO RX PROVIDED IN LOCKSET.

HARDWARE GROUP NO. 212E

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1 4.5 X 4.5 (PROVIDE NRP @ OUTSWING, LOCKABLE DOORS)	652	IVE
1	EA	MANUAL FLUSH BOLT	FB358/FB458 AS REQ	626	IVE
1	EA	DUST PROOF STRIKE	DP2	626	IVE
1	EA	STOREROOM LOCK	L9080T 07B	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
2	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS) (PERIMETER SEAL BY ALF MFR @ ALF)	BK	ZER
1	SET	MEETING STILE	8193AA (2 PCS - 1 SET) (OMIT @ NON-RATED DOORS)	AA	ZER

-DOORS TO SWING 180 DEGREES.

HARDWARE GROUP NO. 331CL

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 (PROVIDE NRP @ OUTSWING, LOCKABLE DOORS)	652	IVE
1	EA	CORRIDOR LOCK W/ OUTSIDE INDICATOR	L9456T 07B 09-544 OS-OCC	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	SURFACE CLOSER	1461 SCUSH TBWMS X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS (OMIT @ HMD)	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS) (PERIMETER SEAL BY ALF MFR @ ALF)	BK	ZER

-OCCUPIED/VACANT INDICATOR ON OUTSIDE OF DOOR.

HARDWARE GROUP NO. 331L

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 (PROVIDE NRP @ OUTSWING, LOCKABLE DOORS)	652	IVE
1	EA	CORRIDOR LOCK W/ OUTSIDE INDICATOR	L9456T 07B 09-544 OS-OCC	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	SURFACE CLOSER	1461 RW/PA TBWMS X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS (OMIT @ HMD)	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS) (PERIMETER SEAL BY ALF MFR @ ALF)	BK	ZER

-OCCUPIED/VACANT INDICATOR ON OUTSIDE OF DOOR.

HARDWARE GROUP NO. 710AEFHMZ-D

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	112XY	628	IVE
1	EA	KEYED REMOVABLE MULLION	KR4954 STAB	689	VON
1	EA	PANIC HARDWARE	CD-98-EO-SNB LENGTH AS REQ	626	VON
1	EA	PANIC HARDWARE	CD-98-NL-OP-SNB LENGTH AS REQ	626	VON
1	EA	RIM CYLINDER	TYPE AS REQ W/KEYED CONST. CORE	626	SCH
3	EA	MORTISE CYLINDER	TYPE AS REQ W/KEYED CONST. CORE	626	SCH
4	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
2	EA	OFFSET DOOR PULL	9264F 12" O	630	IVE
2	EA	SURFACE CLOSER	4040XP EDA TBWMS X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	FLOOR STOP/HOLDER	FS40 SERIES AS REQ	626	IVE
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER
1	SET	SEAL	PERIMETER SEAL BY FRAME MFR		
1	SET	ASTRAGAL	MEETING STILE SEAL BY DOOR MFR		

-VERIFY ALUMINUM DOOR IS WIDE STILE.

-5" STILE IS REQUIRED FOR THE SPECIFIED HARDWARE, COORDINATE WITH DOOR
MFR./SUPPLIER.

-DOORS TO SWING 180 DEGREES.

HARDWARE GROUP NO. 711ACH-D

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	LD-98-L-NL-07-SNB LENGTH AS REQ	626	VON
1	EA	RIM CYLINDER	TYPE AS REQ W/KEYED CONST. CORE	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	SURFACE CLOSER	4040XP SHCUSH TBWMS X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	SET	SEAL	PERIMETER SEAL BY FRAME MFR		

-VERIFY ALUMINUM DOOR IS WIDE STILE.

-5" STILE IS REQUIRED FOR THE SPECIFIED HARDWARE, COORDINATE WITH DOOR
MFR./SUPPLIER.

HARDWARE GROUP NO. C001

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	MORTISE CYLINDER	TYPE AS REQ W/KEYED CONST. CORE (AS REQ)	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	CREDENTIAL READER	CREDENTIAL READER BY SECURITY CONTRACTOR		
1	EA	DOOR CONTACT NOTE	674-OH BALANCE OF HARDWARE BY DOOR MFR	628	SCE

-COORDINATE HARDWARE REQUIREMENTS WITH DOOR MANUFACTURER PRIOR TO SUBMITTALS.

-REMOVE CYLINDER AND CORE IF NOT REQUIRED.

HARDWARE GROUP NO. C201

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 (PROVIDE NRP @ OUTSWING, LOCKABLE DOORS)	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	EU MORTISE LOCK	L9092T EU 07B RX DPS CON (FAIL SECURE)	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	SURFACE CLOSER	1461 RW/PA TBWMS X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS (OMIT @ HMD)	630	IVE
1	EA	WALL STOP	WS406/407CCV	630	IVE
1	EA	GASKETING	488S PSA H & J (USE SILENCERS @ NON-RATED DOORS) (PERIMETER SEAL BY ALF MFR @ ALF)	BK	ZER
1	EA	WIRE HARNESS (IN DOOR)	ALLEGION CONNECT TYPE & LENGTH AS REQ		SCH
1	EA	WIRE HARNESS (TO POWER SUPPLY)	CON-6W - CONNECTION LEADS		SCH
1	EA	CREDENTIAL READER	CREDENTIAL READER BY SECURITY CONTRACTOR		
1	EA	POWER SUPPLY	PS902 900-2RS 120/240 VAC (OMIT 2RS BOARD WHERE NOT REQ)	LGR	SCE

-INGRESS BY THE CREDENTIAL READER OR KEY OVERRIDE.

-FREE EGRESS BY LEVER.

-COORDINATE POWER SUPPLY WITH SECURITY CONTRACTOR PRIOR TO SUBMITTALS.

-OMIT POWER SUPPLY WHERE PROVIDED BY SECURITY.

HARDWARE GROUP NO. C205

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	VANDL EU MORTISE LOCK	LV9092TEU 07B RX CON 12/24 VDC (FAIL SECURE)	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBWMS X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS (OMIT @ HMD)	630	IVE
1	EA	RAIN DRIP	142AA DW + 4" (OMIT @ COVERED OPENINGS)	AA	ZER
1	SET	GASKETING	328AA H & J	AA	ZER
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER
1	EA	WIRE HARNESS (IN DOOR)	ALLEGION CONNECT TYPE & LENGTH AS REQ		SCH
1	EA	WIRE HARNESS (TO POWER SUPPLY)	CON-6W - CONNECTION LEADS		SCH
1	EA	CREDENTIAL READER	CREDENTIAL READER BY SECURITY CONTRACTOR		
1	EA	DOOR CONTACT	679-05 TYPE AS REQ	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-2RS 120/240 VAC (OMIT 2RS BOARD WHERE NOT REQ)	LGR	SCE

-INGRESS BY THE CREDENTIAL READER OR KEY OVERRIDE.

-FREE EGRESS BY THE PUSH PAD.

-COORDINATE POWER SUPPLY WITH SECURITY CONTRACTOR PRIOR TO SUBMITTALS.

-OMIT POWER SUPPLY WHERE PROVIDED BY SECURITY.

HARDWARE GROUP NO. C714M-1

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	224XY EPT	628	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	KEYED REMOVABLE MULLION	KR4954XP STAB	689	VON
1	EA	ELEC PANIC HARDWARE	LD-RX-XP98-DT-CON-SNB LENGTH AS REQ	626	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-XP98-NL-CON-SNB LENGTH AS REQ	630	VON
1	EA	RIM CYLINDER	TYPE AS REQ W/KEYED CONST. CORE	626	SCH
1	EA	MORTISE CYLINDER	TYPE AS REQ W/KEYED CONST. CORE (FOR MULLION)	626	SCH
2	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH TBWMS X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS (OMIT @ HMD)	630	IVE
1	EA	RAIN DRIP	142AA DW + 4" (OMIT @ COVERED OPENINGS)	AA	ZER
1	SET	MEETING STILE	328AA (2 PCS - 1 SET)	AA	ZER
1	SET	GASKETING	328AA H & J	AA	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER
2	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER
2	EA	WIRE HARNESS (IN DOOR)	ALLEGION CONNECT TYPE & LENGTH AS REQ		SCH
2	EA	WIRE HARNESS (TO POWER SUPPLY)	CON-6W - CONNECTION LEADS		SCH
1	EA	CREDENTIAL READER	CREDENTIAL READER BY SECURITY CONTRACTOR		
2	EA	DOOR CONTACT	679-05 TYPE AS REQ	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC (OMIT 2RS BOARD WHERE NOT REQ)		VON

-INGRESS BY THE CREDENTIAL READER OR KEY OVERRIDE.
-FREE EGRESS BY THE PUSH PADS.
-INACTIVE LEAF PULL INCLUDED FOR AESTHETICS ONLY.
-COORDINATE POWER SUPPLY WITH SECURITY CONTRACTOR PRIOR TO SUBMITTALS.
-OMIT POWER SUPPLY WHERE PROVIDED BY SECURITY.

HARDWARE GROUP NO. C715

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-XP98-NL-CON-SNB LENGTH AS REQ	630	VON
1	EA	RIM CYLINDER	TYPE AS REQ W/KEYED CONST. CORE	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH TBWMS X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS (OMIT @ HMD)	630	IVE
1	EA	RAIN DRIP	142AA DW + 4" (OMIT @ COVERED OPENINGS)	AA	ZER
1	SET	GASKETING	328AA H & J	AA	ZER
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER
1	EA	WIRE HARNESS (IN DOOR)	ALLEGION CONNECT TYPE & LENGTH AS REQ		SCH
1	EA	WIRE HARNESS (TO POWER SUPPLY)	CON-6W - CONNECTION LEADS		SCH
1	EA	CREDENTIAL READER	CREDENTIAL READER BY SECURITY CONTRACTOR		
1	EA	DOOR CONTACT	679-05 TYPE AS REQ	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC (OMIT 2RS BOARD WHERE NOT REQ)		VON

-INGRESS BY THE CREDENTIAL READER OR KEY OVERRIDE.
-FREE EGRESS BY THE PUSH PAD.
-COORDINATE POWER SUPPLY WITH SECURITY CONTRACTOR PRIOR TO SUBMITTALS.
-OMIT POWER SUPPLY WHERE PROVIDED BY SECURITY.

HARDWARE GROUP NO. C795

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-XP98-NL-CON-SNB LENGTH AS REQ	630	VON
1	EA	RIM CYLINDER	TYPE AS REQ W/KEYED CONST. CORE	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH SRI TBWMS X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS (OMIT @ HMD)	630	IVE
1	EA	RAIN DRIP	142AA DW + 4" (OMIT @ COVERED OPENINGS)	AA	ZER
1	SET	GASKETING	328AA H & J	AA	ZER
1	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER
1	EA	WIRE HARNESS (IN DOOR)	ALLEGION CONNECT TYPE & LENGTH AS REQ		SCH
1	EA	WIRE HARNESS (TO POWER SUPPLY)	CON-6W - CONNECTION LEADS		SCH
1	EA	CREDENTIAL READER	CREDENTIAL READER BY SECURITY CONTRACTOR		
1	EA	DOOR CONTACT	679-05 TYPE AS REQ	BLK	SCE
1	EA	POWER SUPPLY	PS902 900-2RS 900-BBK 120/240 VAC (OMIT 2RS BOARD WHERE NOT REQ)		VON

- INGRESS BY THE CREDENTIAL READER OR KEY OVERRIDE.
- FREE EGRESS BY THE PUSH PAD.
- COORDINATE POWER SUPPLY WITH SECURITY CONTRACTOR PRIOR TO SUBMITTALS.
- OMIT POWER SUPPLY WHERE PROVIDED BY SECURITY.

HARDWARE GROUP NO. DE714M-D

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
2	EA	CONT. HINGE	224XY EPT	628	IVE
2	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	KEYED REMOVABLE MULLION	KR4954XP STAB	689	VON
1	EA	ELEC PANIC HARDWARE	LD-RX-XP98-NL-SNB LENGTH AS REQ	626	VON
1	EA	ELEC PANIC HARDWARE	LD-RX-XP98-DT-CON-SNB LENGTH AS REQ	626	VON
1	EA	MORTISE CYLINDER	TYPE AS REQ W/KEYED CONST. CORE (FOR MULLION)	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
2	EA	SURFACE CLOSER	4040XP SCUSH TBWMS X MTG BRKT, SPCR & PLATE AS REQ	689	LCN
2	EA	KICK PLATE	8400 10" X 2" LDW B-CS (OMIT @ HMD)	630	IVE
1	EA	RAIN DRIP	142AA DW + 4" (OMIT @ COVERED OPENINGS)	AA	ZER
1	SET	GASKETING	328AA H & J	AA	ZER
1	SET	MEETING STILE	8193AA (2 PCS - 1 SET)	AA	ZER
1	EA	MULLION SEAL	8780NBK PSA	BK	ZER
2	EA	DOOR SWEEP	8198AA	AA	ZER
1	EA	THRESHOLD	65A	A	ZER
2	EA	WIRE HARNESS (IN DOOR)	ALLEGION CONNECT TYPE & LENGTH AS REQ		SCH
2	EA	WIRE HARNESS (TO POWER SUPPLY)	CON-6W - CONNECTION LEADS		SCH
2	EA	DOOR CONTACT	679-05 TYPE AS REQ	BLK	SCE
-DOOR CONTACTS FOR MONITORING.					

HARDWARE GROUP NO. J714MY

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	FIXED MULLION	FIXED MULLION BY RELATED SECTION		
1	EA	PANIC HARDWARE	LD-XP98-EO-WH-SNB LENGTH AS REQ	626	VON
1	EA	PANIC HARDWARE	LD-XP98-NL-WH-SNB LENGTH AS REQ	626	VON
1	EA	RIM CYLINDER	TYPE AS REQ W/KEYED CONST. CORE	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
2	EA	SURFACE CLOSER	4041 DEL SCUSH SRI TBWMS X MTG BRKT, SPCR & PLATE AS REQ (RIVNUTS AS REQ)	689	LCN
		NOTE	BALANCE OF HARDWARE BY GATE MFR		

HARDWARE SET IS A GUIDELINE

-VERIFY AND COORDINATE ALL HARDWARE WITH GATE MANUFACTURER PRIOR TO SUBMITTALS.

-ALL REMAINING HARDWARE BY GATE MFR.

HARDWARE GROUP NO. J715Y

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PANIC HARDWARE	LD-XP98-NL-WH-SNB LENGTH AS REQ	626	VON
1	EA	RIM CYLINDER	TYPE AS REQ W/KEYED CONST. CORE	626	SCH
1	EA	PRIMUS CORE	20-740-XP CKC	626	SCH
1	EA	SURFACE CLOSER	4041 DEL SCUSH SRI TBWMS X MTG BRKT, SPCR & PLATE AS REQ (RIVNUTS AS REQ)	689	LCN
		NOTE	BALANCE OF HARDWARE BY GATE MFR		

HARDWARE SET IS A GUIDELINE

-VERIFY AND COORDINATE ALL HARDWARE WITH GATE MANUFACTURER PRIOR TO SUBMITTALS.

-ALL REMAINING HARDWARE BY GATE MFR.

END OF SECTION

SECTION 08 80 00

GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Glass and glazing accessories.
- B. Related Sections:
 - 1. Section 06 40 00 - Architectural Woodwork; display case glass, track, and hardware.
 - 2. Section 07 92 00 - Joint Sealants
 - 3. Section 08 11 00 - Hollow Metal Doors and Frames.
 - 4. Section 08 14 23 - Plastic-laminate-faced Wood Doors.
 - 5. Section 08 41 13 - Aluminum-framed Entrances and Storefronts.

1.2 PERFORMANCE REQUIREMENTS

- A. Glass and glazing materials of this section shall provide continuity of building enclosure vapor and air barrier
 - 1. In conjunction with materials described in SECTION 07 92 00 - JOINT SEALANTS.
 - 2. Maintain continuous air and vapor barrier throughout glazed assembly from glass pane to heel bead of glazing sealant.
- B. Design and size glass to withstand dead loads and live loads caused by pressure and suction of wind as calculated in accordance with building code, and measured in accordance with ASTM E 330.
- C. Limit glass deflection to $l/200$ or flexure limit of glass with full recovery of glazing materials, whichever is less.

1.3 SUBMITTALS

- A. Submit product data and samples under provisions of SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
- B. Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- C. Provide data on glazing sealant. Identify colors available.
- D. Samples:
 - 1. Submit 2 samples of each type of glass (except clear glass), 12" x 12" in size, illustrating glass unit, coloration, design.
 - 2. Submit 4" long bead of glazing sealant in color selected.

1.4 QUALITY ASSURANCE

- A. Glazing Standards: Comply with recommendations of Glass Association of North America (GANA) "Glazing Manual."
- B. Source Quality Control: Glass shall be identified by the manufacturer's labels of grade and quality. Temporary labels shall not be removed until final cleaning. Permanent labels on tempered glass shall not be removed.
 - 1. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
 - 2. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the IGCC.
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.

- D. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 257.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect glass and glazing materials during delivery, storage, and handling as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, or temperature changes, and other causes.

1.6 WARRANTY

- A. Provide written 10-year warranty signed by manufacturer of insulating glass agreeing to furnish replacements for those insulating glass units developing manufacturing defects. Manufacturing defects are defined as failure of hermetic seal of air space (beyond that due to glass breakage) as evidenced by intrusion of dirt or moisture, internal condensation or fogging, and other visual indications of seal failure or performance.
- B. Provide written 5-year warranty signed by manufacturer of spandrel glass agreeing to furnish replacements for those spandrel glass units developing defects of ceramic frit. Warranty covers deterioration due to normal conditions of use.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Basis of Design products are Vitro Architectural Glass (PPG): Provide glass as manufactured by one of the following:
- AGC Glass North America
 - Guardian Industries Corp.
 - Technical Glass Products
 - Oldcastle Building Envelope
 - Pilkington North America, Inc. (NSG Group)
 - Vitro Architectural Glass (formerly PPG Glass)

2.2 GLASS

- A. (TT1) Tinted, Tempered, Insulating Low-E Glass: Manufacturer's standard 1" thick pre-assembled units consisting of 2 sheets of tempered glass, ASTM C 1048, enclosing a hermetically sealed dehydrated air space; with spacers, sealant, and without protective edge banding. Metal spacers shall be finished to match finish of aluminum storefronts.
1. Thickness of Each Pane: 1/4".
 2. Air Space Thickness: 1/2".
 3. Interior Pane: Type I, Class 1 (Clear), Quality q3 (Glazing select), Kind FT - Fully Tempered, Condition A - Uncoated surfaces.
 4. Exterior Pane: Type I, Class 2 - Vitro Solargray tint (Tinted Heat-Absorbing and Light-Reducing), Quality q3 (Glazing select), Kind FT - Fully Tempered, Condition C - Other coated surfaces with low-emissivity Vitro Solarban R100 coating on second surface
 5. Performance Characteristics: Low-E insulating glass shall comply with the following:
 - a. Solar Heat Gain Coefficient: 0.17
 - b. Winter U-value: 0.29.
 - c. Visible Transmittance: 21%
- B. (TFE1) Tinted, Forced-Entry Resistant, Tempered, Insulating Low-E (Safety): Manufacturer's standard 1" thick pre-assembled units consisting of 2 sheets of tempered glass, ASTM C 1048, enclosing a hermetically sealed dehydrated air space; with spacers, sealant, and without protective edge banding. Metal spacers shall be finished to match aluminum storefronts.
1. Interior Pane:
 - a. Minimum 1/4" thickness (6mm), ASTM C 1048, Type I, Class 1 (Clear), Quality q3 (Glazing select). Kind FT - Fully Tempered, Condition A - Uncoated surfaces, insulated unit

- b. Film: Provide 3M Ultra 800 Safety and Security Window Film or approved equivalent. Security film to be a minimum of 8 mil thick meeting UL 972-Standard for Safety Burglary Resisting Glazing Material.
 - 1) Acceptable suppliers of film:
 - 3M
 - School Guard Glass
 - c. Provide forced-entry glass for new aluminum framed doors and windows as indicated. Include glazing anchor system as specified for safety.
 - d. Color: Clear
 - 2. Air Space Thickness: 1/2".
 - 3. Exterior Pane: 1/4" thick, Type I, Class 2 - Vitro Solargray tint (Tinted Heat-Absorbing and Light-Reducing), Quality q3 (Glazing select), Kind FT - Fully Tempered, Condition C - Other coated surfaces with low-emissivity Vitro Solarban 100 coating on second surface
 - 4. Structural Sealant Manufacturer:
 - a. Dow Corning (995) or approved equivalent.
 - 5. Accessories:
 - a. BondKap or approved equivalent.
 - 6. Performance Characteristics: Low-E insulating glass shall comply with the following:
 - a. Solar Heat Gain Coefficient: 0.17
 - b. Winter U-value: 0.29.
 - c. Visible Transmittance: 21%
- C. (CT4) Clear, Tempered Glass: ASTM C 1048, Type I, Class 1 (Clear), Quality q3 (Glazing select). Kind FT - Fully Tempered, Condition A - Uncoated surfaces, 1/4" thickness.
- D. (ST1) Spandrel, Tempered, 1" thick Insulating Glass:
- 1. Ceramic coated spandrel glass, ASTM C 1048, Condition B (spandrel glass one surface ceramic coated), Kind FT (fully tempered), Type I (transparent glass, flat), Class 1 (clear), quality q3 (glazing select) and complying with requirements specified.
 - 2. Fallout Resistance: Provide spandrel units identical to those passing fallout resistant test for spandrel glass specified in ASTM C 1048.
 - 3. Thickness of each Pane: 1/4".
 - 4. Interior Pane: Clear tempered glass - Ceramic Frit on Side 4. Color as selected by Architect.
 - 5. Air Space Thickness: 1/2".
 - 6. Exterior Pane: Type I, Class 1 (Clear), Quality q3 (Glazing select), Kind FT - Fully Tempered, Condition A - with low-emissivity Vitro Solarban 100 coating on second surface.
- E. Clear Glass Mirrors, Unframed: ASTM C 1503, Mirror Select.
- 1. Nominal thickness 1/4". Backs shall have two coats of silver hermetically sealed, complying with GS-27, with an impervious protective coating of copper deposited over silver by electrolysis, and finished with a special composition hard, mirror-backing paint. Mirrors shall bear manufacturer's labels. Mirrors shall have ground and polished edges.
 - 2. Mirror Back Safety Tape: ANSI Z97.1.
 - 3. J-Molds: Provide stainless steel continuous "J" clip at bottom and "J" clips around perimeter of mirror to anchor mirror to wall (Approx. Size: 3/8" x 3/8").

2.3 GLAZING MATERIALS

- A. Glazing Compound: Comply with ASTM C 1311 or FS TT-S-00230, one-part, non-sag acrylic polymeric sealant. Product/manufacturer; one of the following:
 - Acryl-R Acrylic Sealant; Schnee-Moorehead, Inc.
 - Mono 555; Tremco
- B. Channel Glazing Strips; Hollow Metal Doors and Frames: Provide black vinyl channel glazing strips, Glazing Vinyl for 990 Sliders Part #6062-01 as manufactured by Kawneer.
- C. Accessories: Setting blocks, tape, vinyl gaskets and spacer strips as required for a complete installation.
- D. Mirror Mastic: Combination of asphaltic bitumens, fibers and mineral spirits. Product/manufacturer; one of the following:
 - Gunther Pro®; Gunther Mirror Mastics
 - 7HR4 Mirror Tac®; Pecora Corp.
 - Mirro-Mastic; Palmer Products Corporation.

- E. Anchor System for Bullet-Resistant Glazing: Provide transfer adhesive and anchor at edges of film to secure film, as recommended by the nano-technology fluid manufacturer.
 - 1. Clean powder or laitance from gasketing before applying silicone.
 - 2. With glass secure, cut the anchoring system (BondKap) to size and apply the silicone adhesive to the window frame and glass. Provide Dow 995 Structural Silicone adhesive (or approved alternative) to be used for all anchoring of film to window frame/glazing system. Dow Corning® 995 Silicone Structural Glazing Sealant is a one-component neutral-curing silicone sealant designed specifically for structural bonding applications of glass and metal in factory or field situations.
 - 3. Place the anchoring system strips in desired location, press in place and clean any excessive silicone.
 - 4. With this method, there shall be ½" of silicone contacting the window film and ½" contacting the window frame providing the approved structural support as specified.
- F. Glazing Sealant for Fire-Resistive Glazing Products: Identical to product used in test assembly to obtain fire-protection rating.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine areas to receive glass for conditions that will adversely affect the execution and quality of work. Do not start this work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Setting Glass: Glazing shall be done at the site by skilled glaziers in conformance with the general conditions governing glazing in the GANA Glazing Manual.
 - 1. Glazing of aluminum windows and storefront shall be done in conformance with the methods recommended by the manufacturer of the aluminum items. Beads or stops furnished with the items to be glazed shall be used to secure the glass in place.
 - 2. For interior hollow metal door and frame glazing, install channel glazing strips and place glass within glazing strips. Install the removable stop and position the channel glazing strip to seal completely the void around the glass.
 - 3. Verify glass sizes for required edge clearances by measuring the openings. Cut each piece accurately and fit to its particular position. Center glass in the opening vertically and horizontally. Use edge blocks in vertical jambs to prevent lateral "walking" of the glass.
 - 4. Glass shall have clean cut edges. Do not seam, nip, stone or strike edges, or scarf corners, and do not install glass with flared edges at the bottom. Do not bump, drag, or rest the edge of a glass light against metal or other hard objects.
 - 5. Set tempered glass with tong marks completely concealed or in as inconspicuous a location as possible.
- B. Glass Mirrors:
 - 1. Apply one additional coat of moisture-resistant paint, type recommended by manufacturer, to back of mirror.
 - 2. Allow to dry.
 - 3. Apply safety tape to back of mirror in strips leaving 25% of surface free for application of mastic.
 - 4. Apply mirror mastic to cover not more than 25% of back mirror, 1/8" to 1/2" thickness of setting bed.
 - 5. Set mirror on concealed shelf angle.
 - 6. Press mirror against substrate to bond.
 - 7. Leave open ventilation space, 1/8" minimum between mirror and substrate.
 - 8. Do not seal off ventilation space at edge of mirror.

3.3 CLEANING

- A. Upon completion of the building, clean glass on both sides and remove labels, paint spots, putty and other defacement. Replace damaged glass with new.

END OF SECTION

SECTION 08 91 00

LOUVERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Fixed, extruded-aluminum wall louvers.

1.2 SUBMITTALS

- A. Product Data: Submit in accordance with Section 01 33 23. Include manufacturer's installation instructions.

1.3 QUALITY ASSURANCE

- A. Comply with SMACNA Architectural Sheet Metal Manual recommendations for fabrication, construction details and installation procedures.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Louver Type: Basis of Design: Model ELT as manufactured by Ruskin. Provide 5" depth stationary wind-driven rain and hurricane louvers fabricated of 6063-T6 extruded aluminum alloy.
 - 1. Size: Minimum 20"w x 16"h.
 - 2. Finish: Color as selected by Architect from manufacturer's full line.
- B. Louver Type: Provide 5" depth stationary, wind-driven rain resistant type louvers fabricated of 6063-T6 extruded aluminum alloy, minimum 0.080" thick frame and minimum 0.060" thick blades. Product/manufacturer; one of the following:
 - Model RSH-5700; Construction Specialties, Inc.
 - Model SP-537; Industrial Louvers, Inc.
 - Model IL-59; Louvers & Dampers, Inc.
- 1. Aluminum Finish: Aluminum surfaces of louvers and all their associated parts shall be Architectural Class I AA-M12C22A42 Hard Coat Color Anodic Coating Dark bronze color. Screw and bolt heads exposed to view shall be finished to match the exposed aluminum surfaces.

2.2 MATERIALS

- A. Aluminum Sheet: ASTM B 209, Alloy 3003 or 5005 with temper as required for forming.
- B. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.
- C. Fasteners shall be aluminum. Provide types, gages and lengths to suit unit installation conditions. Use Phillips flat-head machine screws for exposed fasteners.
- D. Screens: Provide removable screens consisting of U-shaped metal for permanently securing screen mesh. Provide bird screens of 5/8" x .040" expanded aluminum frame.
- E. Insulated Metal Blank-off Panel: Provide insulated metal blank-off panel (painted black) at all louver areas not utilized by mechanical ducts at mechanical rooms.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install the louvers in accordance with the manufacturer's recommendations. Erect to be straight and plumb with horizontal lines level. The completed installation shall be rigid and weathertight.
- B. Use concealed anchorages wherever possible.

- C. Provide concealed gaskets and flashings and install as work progresses to make installations weathertight.

END OF SECTION

SECTION 09 21 16

GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal stud wall framing.
 - 2. Furred wall framing.
 - 3. Metal channel ceiling framing.
 - 4. Gypsum board partitions, ceilings, and furrings
 - 5. Finishing of panel joints.
- B. Related Sections:
 - 1. Section 06 16 56 - Air- and Water-Resistive Sheathing Board System
 - 2. Section 05 40 00 - Cold-Formed Metal Framing: exterior wall studs.
 - 3. Section 07 21 00 - Building Insulation: acoustical and thermal insulation.
 - 4. Section 07 53 00 - Single-ply Membrane Roofing: gypsum board base under roof insulation.
 - 5. Section 07 84 00 - Firestopping.
 - 6. Section 09 30 13 - Ceramic Tiling: backer board at shower areas.

1.2 SUBMITTALS

- A. Product Data: Submit in accordance with Section 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, SAMPLES. Submit materials list of items proposed to be provided, manufacturer's data indicating compliance with specified requirements, and manufacturer's recommended installation procedures.
- B. Submit diagrams of proposed control joint and expansion joint layout prior to starting work.

1.3 QUALITY ASSURANCE

- A. Tolerances for Drywall: Do not exceed a variation of 1/8" in 10'-0" and 1/16" in 5'-0" from plumb, level, and flat (all directions) and do not exceed 1/16" offset of planes at joints between panels. Shim panels as necessary to comply with tolerances.
- B. Perform Work in accordance with ASTM C 840, GA-216, GA-223 and GA-600.

1.4 PROJECT CONDITIONS

- A. Environmental Requirements: In cold weather, maintain the temperature of the building reasonably constant at no less than 55° F. during gypsum panel application and joint finishing. Provide adequate ventilation to carry off excess moisture.

1.5 DELIVERY, STORAGE, HANDLING

- A. Deliver, store, handle, and protect products in conformance with manufacturer's instructions and in accordance with Section 01 65 00 - PRODUCT DELIVERY REQUIREMENTS and Section 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS.
- B. Store inside building, on sleepers, and out of water.

1.6 QUALIFICATIONS

- A. Applicator: Company specializing in performing the work of this section with minimum three years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Gypsum Board: ASTM C 1396. Provide Type X fire-rated; 48"w x 5/8" thick by maximum permissible length gypsum board with tapered edges. Product/manufacturer; one of the following:

CertainTeed Type X; CertainTeed Gypsum

ToughRock Fireguard X Gypsum Board: G-P Gypsum Corp.

Fire-Shield Gypsum Wallboard; National Gypsum Co.

Sheetrock Brand Firecode X Gypsum Panel; USG Corporation

- B. Water- and Mold-Resistant Gypsum Board: ASTM C 1396. Provide Type X, water and mold resistant gypsum board with tapered edges; 48"w x 5/8" thick by maximum permissible length.

1. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

2. Provide at substrate for ceramic tile in toilets, EWC alcoves, and other wet areas (except showers)

3. Provide at interior face of exterior walls around all window openings, within 4'-0" of opening, including the inset/returns around the window frame.

4. Product/manufacturer; one of the following:

M2Tech Type X; CertainTeed Gypsum

ToughRock Fireguard X Mold-Guard Gypsum Board: G-P Gypsum Corp.

Gold Bond XP Fire-Shield Gypsum Wallboard; National Gypsum Co.

Sheetrock Brand Mold Tough Firecode X Gypsum Panel; USG Corporation

- C. Sheathing Board System: Reference SECTION 06 16 56 - AIR- AND WATER-RESISTIVE SHEATHING BOARD SYSTEM.

- D. Studs: ASTM C 645. Non-loadbearing channel type roll-formed from minimum 25 gauge electro- or hot-dipped galvanized steel.

1. Provide 20 gauge (33 Mil) studs at interior ceramic tile partitions.

2. Provide 18 gauge studs, per SECTION 05 40 00 - COLD-FORMED METAL FRAMING, at all X-bracing.

- E. Slotted Top Track: Basis of design shall be MaxTrak (SLT) Slotted Deflection Track System, as manufactured by Clark Dietrich or approved equivalent.

1. 25 ga thick, to ASTM A653/A653M, Grade 33 with a minimum yield point of 33,000 psi, electro- or hot-dipped galvanized steel.

2. 2-1/2" down-standing legs with 1/4" wide by 1-1/2" high slots spaced at 1" on center.

3. Track width shall match stud size by manufacturer's standard length.

4. Fasteners: ASTM C 1002, self-drilling, self-tapping screws.

- F. Furring, Framing and Accessories: Provide in conformance with ASTM C 645, GA-216, and GA-600 and as follows:

1. Cold Rolled Channels: 3/4", 1-1/2" and 2" x 9/16", 16 gauge, steel channels prime painted.

2. Furring Channels: ASTM 645, 7/8" deep x 1-1/4" face, roll-formed from 25 gauge electro-galvanized steel and furnished with galvanized wire clips.

3. Resilient Furring: 1/2" deep x 2" x 1-1/4" screw flange, 25 gage, galvanized with one leg attached only, Style RC-1 PRO™ as manufactured by ClarkDietrich Building Systems.

- G. Fasteners: ASTM C 514 for nails and C 1002 for screws as follows:

1. Inserts, clips, bolts, nails or other screws as recommended by wallboard manufacturer, of type and size to suit application and to rigidly secure materials in place.

2. Self-drilling, self-tapping bugle head screws for use with power drive tool.

3. Screws: Drywall Screws, Type S Bugle Head.

4. Metal framing to structure: Power driven screw fasteners to withstand 190 lb. single shear resistance and 200 lb. bearing force when drive through structural head or base and without exceeding allowable design stress in runner, fastener, or structural support.

5. Metal to metal: 3/8", Type S or S-12, pan head screws.
 6. Gypsum board to sheet metal application: Type S Bugle Head screws.
 7. Gypsum board to gypsum board application: Type G screws.
- H. Adhesive: Utilize adhesive meeting requirements of GA-216 over metal framing.
1. Adhesives shall have a VOC content of [50] <Insert value> g/L or less.
 2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- I. Accessories:
1. Runners: ASTM C 645, channel type sections roll-formed from electro-galvanized steel with unhemmed edges. Same gauge as studs with which used.
 2. Hangers: No. 8 gauge annealed, galvanized wire.
 3. Tie Wire: No. 16 gauge annealed, galvanized wire.
 4. Trim: Galvanized steel corner reinforcements, edge trim angles and casings; USG No. 200 series.
 5. Reinforcing Tape: 2-3/16" minimum width, cross laminated, spark perforated fiber tape.
 6. Joint Compound: Quick-drying, polyindurate-type, pre-fill material.
 7. Joint Topping: Vinyl base all-purpose finishing material.
 8. Acoustical Sealant: A one-part acrylic base sealant designed for use with drywall construction.
 9. Edge Sealant: USG Sheetrock Brand W/R Sealant for use in high-moisture room areas.
 10. Control Joints: Roll-formed zinc control joints with 1/4" slot (USG #093).
- J. Special Trim: Softforms reveals by Pitcon Softforms as detailed.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Workmanship: The completed gypsum wallboard surfaces shall be smooth, level or plumb, and acceptable to the finish material applicators. All joint treatment on exposed wallboard shall be invisible after painting.
- B. Ceiling Furring:
1. Install in accordance with ASTM C 754, GA-216, GA-223 and GA-600 and manufacturer's instructions.
 2. Space ceiling hangers 48" o.c. along runner channels and within 6" of ends of channel runs. Wrap or saddle-tie hangers around the runner channels to prevent twisting.
 - a. Under steel construction, wrap hangers around or clip or bolt hangers to a structural steel member (not steel deck).
 - b. Under bar joists suspend hangers from top chord or from bottom chord at panel points only.
 - c. Under ductwork, employ trapeze system of hangers to support ceiling. Do not suspend hangers from ducts, piping or conduit.
 3. Erect runner channels at 48" o.c. maximum and locate a channel within 4" of each parallel wall. Level channels with hangers taut and do not make kinks or bends in the hangers as a means of leveling. At channel splices, overlap ends 12" with flanges interlocked; secure each end with tie wire.
 4. Erect furring channels at 16" o.c. for 1/2" thick gypsum or 24" o.c. for 5/8" thick gypsum board and at right angles to runner channels or main support members; secure with clips or saddle-tie to supports with tie wire. Make end splices by nesting channels 8" and wire tying each end.
 5. At light troffers or other openings that interrupt the runner or furring channels, install additional reinforcing to restore lateral stability of the grillage.
 6. No part of the suspended grillage (main runners and cross furring) shall be permitted to come in contact with abutting masonry walls and partitions.
- C. Wall Furring: For gypsum wallboard over masonry, space furring channels vertically at 24" o.c. maximum and attach with power driven anchors through alternate wing flanges (staggered), spaced 24" o.c. Make end splices with 8" nested laps anchored to wall with two fasteners in each wing. Where necessary, install furring with adjustable furring brackets and 1/2" x 3/4" steel channels to which the furring channels shall be clipped or tied.
- D. Partitions:
1. Follow recommendations of U.S. Gypsum Co., "Gypsum Construction Handbook".
 2. Install studding in accordance with ASTM C 754, GA-216, GA-223 and GA-600.
 3. Erect partitions with studs aligned to be plumb and true. Anchor studs top and bottom with runners, shoes and clips.

4. Attach floor runners to concrete slabs using shielded screws or power driven fasteners. Locate fasteners at corners and at runner ends and spaced not to exceed 24" o.c.
 5. Under drywall ceilings, attach metal runner to ceiling and position studs to engage the ceiling runner. Elsewhere, extend studs above the ceiling and brace securely to the floor above or roof structure above with a continuous top runner and channel braces unless specifically detailed otherwise. Where studs extend more than 24" above finished ceiling line, provide either 5/8" gypsum board on both sides of studs or horizontal bracing at 16" o.c. attached with mechanical fasteners to both flanges of studs.
 6. For fire rated partitions and where specifically detailed or noted, extend studs full height to the floor or roof structure above.
 7. Space studs as shown and noted but not more than 16" o.c. Locate studs not more than 2" from abutting partitions and partition corners. Anchor studs to runner flanges with positive screw engagement where located at corners and at door frame jambs.
 8. At door frame jambs of doorways up to 4'-0" wide, double the studs or reinforce with 20 gauge steel studs. At jambs of doorways over 4'-0" wide, reinforce with two 20 gauge steel studs placed back to back. Fasten reinforcing studs to the anchor clips on each door frame with bolts or screws. Place horizontally over each frame a cut-to-length section of runner track; attach with screws to the adjacent vertical studs.
 9. In chase wall construction, set studs opposite each other with the flanges in the same direction and cross brace between the rows of studs with three 12" high pieces of gypsum board or three pieces of metal stud attached to each pair of studs at the quarter points with drive screws.
 10. Double the studs at vertical control joints in partitions.
 11. Brace partitions to top chord of the structure above with 20 ga. diagonal braces at 4'-0" o.c. minimum. Where floor to structure height exceeds 16'-0", in addition to extending and fastening studs to structure, add 20 ga. stud diagonal braces at 4'-0" o.c. minimum.
 12. At vertical junctures of partitions and window mullions, provide pre-assembled, spring loaded, partition closure pieces.
- E. Slotted Top Track: Install slotted track in strict accordance with manufacturer's written instructions and recommendations.
1. Secure studs to slotted top track with #8 wafer-head screws.
 2. Maintain minimum deflection gap of 0.65 inch between top of stud and top of slotted track.
 3. Limit vertical movement to 1 inch, plus or minus 1/2 inch.
- F. Sealant Application: Caulk those gypsum drywall partitions which have sound attenuation blankets, serving as sound barriers.
1. Apply sealant in two continuous beads underneath runners at the floor and ceiling and where runners are used at partition intersections with dissimilar wall construction.
 2. Fill with sealant the grooves around the edges of wallboard at the floor, ceiling, and intersections with dissimilar walls.
 3. Caulk fully the openings around all cut-outs at electrical boxes, heating ducts and the like.
- G. Wallboard Application:
1. Apply gypsum wallboard first to the ceilings and then to the partitions. Use maximum practical lengths to minimize end joints. Fit ends and edges closely but not forced together.
 2. For single-layer ceiling application, apply wallboard with the long dimension either parallel or at right angles to the framing members. All abutting ends and edges shall occur over framing members, except in horizontal application. Stagger end joints in adjacent rows.
 3. For single-layer wall application with a ceiling height of 8'-2" or less, use either the horizontal or the vertical application method. With a ceiling height over 8'-2" and for fire-rated partitions, use only the vertical application method without any exposed horizontal joints. Stagger the vertical joints on opposite sides of a partition. Extend wallboard full height to the floor or roof structure above where so detailed.
 4. Fasten wallboard firmly to studs and furring channels with power-driven drywall screws. Gypsum board shall extend to within 1/4" of floor line. Drive screw heads close without cutting the surface paper or fracturing the core. Maximum screw spacing shall be 12" o.c. for ceilings and 16" o.c. for partitions. For fire-rated partitions, maximum spacing shall be 12" o.c. Do not drive screws closer than 3/8" from any edge.
 5. For two-layer wall application, apply the base layer of wallboard vertically; attach with screws spaced 16" o.c. Apply the face layer vertically with joints offset 24" from base layer joints; attach with adhesive and 1-5/8" screws spaced 16" o.c.
 6. Wallboard joints in single layer or in face layer of two layer applications shall not occur within 12" of the corners of door frame, window frames, and openings larger than 12" x 12", unless control joints are installed at the corners.
 7. Accurately cut and fit abutting ends, edges and holes for pipes and electrical fixtures. Support the edges of gypsum wallboard at cutouts and openings.

8. Reinforce exposed external corners with metal corner reinforcement.
 9. Where wallboard surfaces abut dissimilar intersecting surfaces such as metal and masonry, trim the meeting edge with a metal trim angle held approximately 1/4" away from the intersecting surface. Caulk the joint full with sealant; tool smooth.
 10. After application, check all gypsum wallboard for loose fasteners; drive tight any found loose.
- H. Control Joints:
1. Isolate gypsum wallboard surfaces with control joints where specifically detailed and where the following conditions exist:
 - a. Partition or furring run exceeds 30 feet without a corner or a ceiling-height door frame.
 - b. Ceiling dimensions exceed 50 feet in either direction.
 - c. Construction changes within the plane of the partition.
 - d. Each side of column furring within a partition run.
 - e. Above each door jamb from head to top of partition.
 - f. At each side of furr downs.
 2. Locate control joints in partitions at less-than-ceiling-height door frames with control joints extending to the ceiling from both top corners.
 3. Make joints with roll-formed zinc control joints (USG #093) with 1/4" slot.
 - a. Do not install roll-formed joint behind ceramic tile. Provide a 1/4" wide gap in the substrate only.
 - b. At acoustical partitions, seal behind the joints with acoustical sealant.
 4. Back-block ceiling control joints with face panel strips laid over the joints.
 5. At acoustical partitions, seal behind partition control joints with batt acoustical insulation stuffed between the doubled studs.
- I. Edge Sealing: On wallboard partitions to be covered with ceramic tile, treat cut edges, holes, corner joints, and intermediate joints with edge sealant before installation of wallboard panels. Treat all fastener heads with edge sealant after installation. Caulking of openings through ceramic tile is specified in SECTION 09 30 00 - TILING.
- J. Joint Treatment:
1. Finish the joints in exposed wallboard, wallboard which is to be covered with vinyl wall covering and carpet wall covering, and wallboard in sound partitions to deck. Joints in wall board to be covered with ceramic tile shall be filled but may be left unfinished.
 2. Fill the V-grooves between boards with quick drying joint compound. Wipe joints clean of excess compound and allow to harden.
 3. Apply a thin layer of joint topping to joints. Immediately embed tape reinforcement over joints, follow with a skim coat of compound.
 4. Apply joint topping over the tape to fill flush with the board surface.
 5. Apply joint topping over the fill coat and feather out smoothly beyond fill coat edge. Sand between coats as necessary to provide a smooth surface ready for painting.
 6. Fill screw head depressions flush with three coats of compound.
 7. Finish metal corner reinforcements and edge and control joint trim with two or three coats of joint compound, using edge of trim as a screed to secure a smooth, flat finish.
- K. Special Finishes for Gypsum Board Surfaces:
1. Areas Designated with Custom Digital Vinyl Wallcovering (Graphics): Examine substrates and installation conditions to ensure surface conditions meet or exceed a Level 5 Finish per ASTM C840 and GA-214-Recommended Levels of Gypsum Board Finish. Recess nails and screws. Repair irregular tape joints, sand and remove dust.
 2. Areas Designated with Wall Protection Panels: Examine substrates and installation conditions to ensure surface conditions meet or exceed a Level 4 finish, per ASTM C840 and GA-214-Recommended Levels of Gypsum Board Finish.
 3. Permanent lighting should be installed and operational for inspection of these areas prior to application of wall finish.

3.2 TOLERANCES

- A. Maximum variation from true flatness: 1/8" in 10 feet in any direction.

END OF SECTION

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SECTION 09 30 00

TILING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Ceramic Tile.
 - 2. Porcelain Tile.
 - 3. Tile Trim and Accessories.
 - 4. Marble and Engineered Thresholds.
- B. Related Sections:
 - 1. Section 06 10 00 - Rough Carpentry; wood blocking at windowsills.
 - 2. Section 07 92 00 - Joint Sealants.
 - 3. Section 09 21 16 - Gypsum Board Assemblies.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data:
 - 1. Submit manufacturer's written product data for each tile type and accessory.
- C. Samples: Submit tile samples of the same size scheduled for each particular type of tile required.
- D. Certificate: Furnish one master grade certificate on ceramic tile executed prior to delivery of the tile to the site.

1.3 QUALITY ASSURANCE

- A. Standard: Tile shall be Standard Grade complying with the requirements of ANSI A 137.1. Deliver tile to the project site in grade sealed containers.

1.4 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is completed and ambient temperature and humidity conditions are being maintained.
- B. Do not install adhesives in a closed, unventilated environment.
- C. Maintain 50°F. during installation of mortar materials.

1.5 MAINTENANCE

- A. Extra Materials: Upon completion of work, deliver to the Owner's maintenance facility one box for each type, field color, pattern, and size of ceramic tile and one box of each type, accent color, pattern, and size of ceramic wall tile installed. Furnish maintenance materials from same manufactured lot as materials installed and enclose in protective packaging with appropriate identifying labels.

PART 2 - PRODUCTS

2.1 TILE

- A. Manufacturers: Ceramic tile and trim as manufactured by American Olean, Dal-Tile Corp., Interceramic, and Crossville Ceramics shall set all standards in the areas of trim shapes availability, tile size, color, pattern, and texture.

- B. Ceramic and Porcelain Tile: Reference "Material Finish Schedule" in drawings for manufacturer, product, color and finish of tile.
 - 1. Thresholds: Engineered polished double beveled engineered solid surface threshold by MS International, Inc. Color and size as scheduled in "Material Finish Schedule" in drawings.
- C. Floor Tile Wet Dynamic Coefficient of Friction: Not less than 0.42, when tested in conformance with ANSI A137.1.

2.2 MORTAR MATERIALS

- A. Portland Cement: ASTM C 150, domestic manufacture.
- B. Dry-Set Mortar: ANSI A 118.1, factory sanded mortar mix.
- C. Latex-Portland Cement: ANSI A 118.15, flexible mortar consisting of cement-based mix and latex additive.
- D. Adhesive: ANSI A 136.1, Type I, prepared organic adhesive.
- E. Grout:
 - 1. Floor:
 - a. ANSI A118.7, latex modified dry-set High Performance Cement Grout or commercial waterproof cement grout. Provide Ultracolor Plus FA as manufactured by MAPEI or approved equivalent by Custom Building Products or Laticrete. Color(s) shall be selected by Architect.
 - b. ANSI A118.3; epoxy grout at kitchen, restrooms, and associated areas. Provide Kerapoxy CQ as manufactured by MAPEI or approved equivalent by Custom Building Products or Laticrete. Color(s) as selected by Architect.
 - 2. Walls: Modified acrylic, premixed Mastic Grout or dry-set grout complying with ANSI A118.7, color(s) as selected by Architect from Custom Building Products, Laticrete, Mapei or approved equal. If Contractor elects to provide dry-set grout, the installation shall be damp cured.
- F. Lime: ASTM C 207, Type S, hydrated lime.
- G. Sand: ASTM C 144, clean, masonry sand.
- H. Water: Clean and potable.
- I. Reinforcement: 1-1/2" x 17 gage galvanized woven steel wire fabric or 2 x 2 x 16/16 gage galvanized welded steel wire fabric.

2.3 SETTING BED MORTAR

- A. Mix one part Portland cement and 4 parts damp sand, by volume. Hydrated lime may be added for plasticity in an amount not to exceed 1/10 part by volume.
- B. Large Format and Heavy Tile Mortar: Provide Ultraflex LFT (medium bed mortar) as manufactured by MAPEI or approved equivalent.
 - 1. High content of dry polymer
 - 2. Nonsag and nonslump formula.
 - 3. Meets the highest ANSI rating of ANSI A118.15.

2.4 CRACK ISOLATION MEMBRANE

- A. General: Manufacturer's standard product that complies with ANSI A118.12 for standard performance and is recommended by the manufacturer for the application indicated.
 - 1. Contractor's Option: Provide either tile manufacturer's standard product as stated above, or the following product:
 - a. Chlorinated Polyethylene Sheet: Non-plasticized elastomer with non-woven polyester laminated to both sides, nominal 0.030" thickness. Product/manufacturer; NobleSeal CIS; Noble Co.

2.5 ACCESSORIES

- A. Metal Floor Transition Trim: Refer to "Material Finish Schedule". Height as required to flush out with top of tile flooring.
- B. Metal Corner and Top of Wainscot Trim: Refer to "Material Finish Schedule".

PART 3 - EXECUTION

3.1 PREPARATION

- A. Sweep concrete slab surfaces clean and free of dirt and debris. Remove oil, grease, paint, and dried mortar.
- B. Concrete Slab-on-grade: Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions and recommendations to produce membrane bonded securely to substrate.
 - 1. Field-Applied Temporary Protective Coating: Protect exposed surfaces of tile against adherence of mortar and grout by pre-coating them with a continuous film of either petroleum paraffin wax or grout release temporary protective coating; taking care not to coat unexposed tile surfaces.

3.2 INSTALLATION

- A. General Workmanship:
 - 1. Center and balance areas of tile, if possible.
 - 2. Do not make an excessive amount of cuts. Usually, no cuts smaller than half size should be made. Make all cuts on the outer edges of the field. Fit tile carefully without marring or chipping the finish.
 - 3. Smooth cut edges. Install tile without jagged or flaked edges.
 - 4. Fit tile closely where edges will be covered by trim, escutcheons or other similar devices.
 - 5. The splitting of tile is expressly prohibited except where no alternative is possible.
 - 6. Maintain the heights of tilework in full courses to the nearest obtainable dimension where heights, given in feet and inches, are not required to fill vertical spaces exactly.
 - 7. Make corners of all tile flush and level with corners of adjacent tile, with due allowance to tolerances for tile as specified in ANSI A137.1.
 - 8. Keep all joint lines straight and even width, including miters.
 - 9. Thoroughly back-up with thin-set bonding material all thin-set units, molded or shaped pieces; secure firmly in place.
 - 10. Thoroughly back-up with mortar-bed mix thick-bed nosings, coves, curbing, gutters, flat tile and trimmers, molded or shaped pieces; secure firmly in place.
 - 11. Bond coat mix shall not be used to back-up thick-bed trim and angles. Coat all thick-bed trim shapes with 1/32" to 1/16" of bond coat mix.
 - 12. Finish floor and wall areas level and plumb with no variations exceeding 1/8" in 8' from the required plane.
 - 13. Install accessories in tile work to be evenly spaced, properly centered with tile joints, and level, plumb and true to the correct projection. Install accessories at locations and heights designated.
 - 14. Finished tile work shall be clean. Replace pitted, chipped, cracked and scratched tiles.
- B. Setting Floor Tile - Conventional:
 - 1. Set floor tile in straight joint pattern using Portland cement mortar in conformance with ANSI A 108.1.
 - 2. Where tile is to be installed over waterproofing membrane, place wire reinforcing and mortar bed over the membrane. Lap reinforcing one full mesh and support so that it is completely embedded in the mortar bed.
 - 3. Spread on a bonding coat of pure Portland cement paste not more than 15 minutes ahead of the mortar bed for quarry tile.
 - 4. Place mortar bed, tamp firmly and screed to true planes and proper slopes. While still plastic, trowel a bond coat of cement paste over the mortar bed or dust a thin layer of dry cement over the mortar bed and work lightly until damp.
 - 5. Set tile firmly on the mortar bed with close, uniform joints. Press and thoroughly beat in tile while the mortar bed is still plastic. Bring surfaces to true planes at the proper position of elevation. Slope tile down to floor drains. Make any adjustment of tile before initial set of the mortar takes place.
- C. Setting Floor Tile - Thinset:
 - 1. Set floor tile in straight joint pattern using dry-set cement mortar in conformance with ANSI A 108.5.
 - 2. Mix and apply dry-set mortar in conformance with the manufacturer's recommendations. Cover surface evenly and comb with a notched trowel not more than 10 minutes before applying tile.

3. Set tile before initial set of the mortar has taken place. Press and beat tile firmly into place to establish proper and complete bond. Joints shall be close and uniform.
- D. Setting Wall Tile:
1. Set base and wall tile over masonry in straight joint pattern using dry-set cement mortar in conformance with ANSI A 108.5.
 2. Set base and wall tile of size less than 12" x 12" over gypsum wallboard in straight joint pattern using organic adhesive in conformance with TCA W242 and ANSI A 108.4.
 3. Set base and wall tile of size more than 12" x 12" over gypsum wallboard in straight joint pattern using Latex Portland cement mortar in conformance with TCA W243 and ANSI A 108.5.
 4. Surfaces to be tiled shall be dry, firm and proper for bond.
 - a. Treat gypsum wallboard surfaces with a primer-sealer; caulk openings around pipes and fixtures with a non-hardening waterproof sealant.
 - b. Apply leveling coat of sanded dry-set mortar over irregular surfaces if and as required to secure plumb, flat surfaces for the application of tile.
 5. Mix and apply mortar and adhesive in conformance with best trade practice and the recommendations of the manufacturer of the materials used. Cover surfaces evenly, with no bare spots, and comb with a notched trowel within 10 minutes of applying tile.
 6. Apply tile before skinning of the adhesive or mortar has taken place. Press and beat firmly into place to obtain at least 75 percent contact area of adhesive or mortar on the tile back.
 7. If tile is face mounted, remove paper and glue before the adhesive or mortar is firmly set; adjust tiles that are out of line.
 8. Provide control joints at all inside corners of wall tile areas. Install sealant in joint. Color as selected by Architect.
- E. Grouting:
1. Force a maximum amount of grout into the joints.
 2. Clean the joints of cushion-edge tile to depth of cushion. Fill joints of square-edge tile flush with face of tile.
 3. Fill all gaps and skips. Mortar shall not show through grouted joints.
 4. Finished grout shall be uniform in color, smooth, and without voids and low spots.
 5. Grout joint width as recommended by tile manufacturer.
 6. Damp cure Portland cement grout for at least 72 hours.
- F. Wall Control Joints:
1. Provide a caulked control joint at same width as grout joints, minimum of 1/8".
 2. After tile work and grout are dry, clean the open control joint and roll-in foam rod stock to leave a joint depth of 1/4".
 3. Fill the joint with primerless one-part acrylic polymeric sealant. Color shall be as selected by Architect.
 4. Tool the sealant smooth.
 5. Where tile on wallboard abuts tile on masonry, provide a 1/4" caulked control joint to separate the two areas.
- G. Joints at Frames: Where ceramic tile abuts frame, provide a minimum 1/8" caulked expansion joint to separate tile from the frame.
1. After tile work and grout are dry, clean the joint at the frame.
 2. Fill the joint with primerless one-part acrylic polymeric sealant.
 3. Color shall be as selected by Architect.
 4. Tool the sealant smooth.
- H. Setting Thresholds:
1. Set in a cement mortar bed mixed dry for tamping.
 2. Press and tamp into place until firmly bedded to the proper level, then lift out, parge the back with cement paste, butter the edges, and relay.
 3. Clean surplus cement from the faces immediately.
- I. Metal Floor Transition Trim:
1. Provide at transition of ceramic floor tile to lower flooring material (e.g. vinyl composition tile, exposed concrete, etc.) where no marble threshold is detailed.
 2. Install as detailed on drawings.
 3. Set transition trim prior to installing ceramic floor tile.
 4. Set tile up tight to transition trim with a factory cushion edge. Trim shall be flush with top of ceramic tile.
 5. After tile work and grout are dry, clean the joint between the trim and the tile.
 6. Fill joint between trim and ceramic floor tile with sealant to match grout.

J. Metal Corner and Top of Wainscot Trim:

1. Provide at all outside corners and top of wainscot of ceramic wall tile.
2. Set metal corner trim prior to installing wall tile.
3. Set tile up to corner trim with a factory cushion edge. Provide a 1/8" joint between tile and trim. Trim shall be flush with faces of ceramic tile.
4. After tile work and grout are dry, clean the joint between the trim and the tile.
5. Fill joint with sealant to match grout.

3.3 CLEANING

- A. When the work of other trades is completed, clean down tile and marble surfaces and leave in first class condition.
1. The use of wire brushes or acids is expressly prohibited.
 2. Replace cracked, broken, and chipped tile with new units.
 3. Correct uneven and stained joints.

END OF SECTION

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SECTION 09 51 00

ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Acoustical panels and exposed suspension systems for ceilings.

1.2 SUBMITTALS

- A. Samples: Submit in accordance with Section 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, SAMPLES. Submit a 12" x 12" sample of each type of acoustic panel. Submit a 6" long sample of each component of each type of exposed suspension system.
- B. Certificate: Submit written certification that the ceiling assemblies installed meet the requirements for the specified UL Time-Design Rating.

1.3 QUALITY ASSURANCE

- A. Erector Qualifications: This work shall be performed by an experienced erector approved by the acoustical material manufacturer.
- B. Fire Protection: The acoustical ceilings so designated on the drawings shall be composed of fire-rated panels and fire-rated suspension systems to meet the requirements for a fire-resistive Time-Design Rating of 1-hour in conformance with Underwriters Laboratories (U.L.) classification.
- C. Pre-ceiling conference:
 - 1. Prior to start of ceiling grid installation, convene pre-ceiling conference at project site.
 - 2. Attendance is required by Contractor, installer, and Architect.
 - 3. Review specifications and drawings of ceiling installation and layout.

1.4 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Before acoustical work is started, all wet work such as concrete and plastering shall be completed and thoroughly dried out.
 - 2. Acoustical ceiling shall not begin until building has been closed to the weather and suitable mechanical ventilation is supplied to maintain condition ranges of 60°F. to 85°F. at not more than 70% R.H. These conditions shall be maintained prior to, during, and after installation.
 - 3. Acoustical panels shall be unpacked and allowed to stabilize for a period of 72 hours, in the environment as defined above, prior to installation.
- B. Work Sequence:
 - 1. Do not start acoustical work until mechanical and electrical work to be covered up has been inspected and approved.
 - 2. Coordinate the related work of other trades involved in the ceiling installation.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store tile and panel cartons open at each end to stabilize moisture content.

1.6 WARRANTY

- A. Acoustic Lay-in Panels: Submit manufacturer's standard 10-year warranty against sagging or warping (defined as greater than 1/8" measured in the panel center) from the date of installation.

1.7 MAINTENANCE

- A. Extra Materials: Upon completion of work, deliver maintenance materials to the project site, packaged with protective covering for storage and identified with appropriate labels. Furnish two boxes of full size acoustical ceiling units of each type installed.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. (ACT-01) Acoustical Lay-in Panels - High NRC: ASTM E 1264, mineral fiber panels, Class A (non-combustible) and having an NRC range of min. 0.70 or better.
1. Sizes:
 - a. 24" x 24" x 3/4": Basis of Design: Armstrong No. Ultima 1910.
 2. Color: Color(s) shall be as selected by Architect.
 3. Acceptable Manufacturers
 - Armstrong World Industries, Inc.
 - CertainTeed Architectural
 - USG Interiors, Inc.
- B. (ACT-02) Vinyl Covered Lay-In Gypsum Board Panels: Provide fine texture white vinyl faced gypsum board panels.
1. Sizes:
 - a. 24" x 24" x 1/2"
 2. Product/manufacturer; one of the following:
 - Vinylrock X CRF; Certain Teed Corporation
 - Sheetrock™ Lay-in Ceiling Panel ClimaPlus; USG Interiors, Inc.
- C. Suspension System; Acoustic Lay-in Panels: Exposed type for panel ceilings as manufactured by the ceiling panel manufacturer or one of the following:
 - Armstrong World Industries, Inc.
 - CertainTeed Architectural
 - Chicago Metallic Corp./Rockfon
 - USG Interiors, Inc.
1. Components shall be roll-formed from steel to meet ASTM C 635 and conform to the requirements for Intermediate duty structural classification. Exposed main tee runners shall be double web with capped face.
 2. Provide single tee adapter clips/unopposed tee clips at off-module cross tee connections where the cross tees intersect a main tee and is not locked into place with another cross tee.
 3. Components shall be electro-zinc coated or hot-dip galvanized and exposed surfaces shall have white enamel finish.
 4. System shall be designed and sized to support the ceiling assembly with a maximum deflection of L/360 of the span.
 5. Color shall be white to match color of lay-in panels.
 6. Fire resistive systems shall be UL listed and labeled for a 1-hour time-design rating.
- D. Perimeter Trim System for Suspended Ceiling System: Provide AXIOM Classic 4" and 12" high extruded aluminum trim as manufactured by Armstrong. Provide manufacturer's standard splice plates, clip brackets, and support brackets with no visible fasteners. Color shall be as selected by Architect from manufacturer's standard color range.
- E. Suspension System: Vinyl Covered Gypsum Board Ceilings: ASTM C 635, heavy duty, 15/16" hot dipped galvanized steel, with aluminum cap with white finish. Product/manufacturer: one of the following:
- Prelude Plus XL Fire Guard Environmental Tee System; Armstrong World Industries
 - DXLA DONN Brand Acoustical Suspension System; USG Interiors, Inc.
- F. Hangers: 12 gage annealed and galvanized steel wire.
- G. Hold-down Clips: UHDC Universal Hold Down Clip by Armstrong.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine areas to receive acoustical treatment for conditions that will adversely affect the execution and quality of work. Designate any areas of potential interference between ceiling components and components of other trades. Do not start this work until unsatisfactory conditions are corrected.

3.2 CEILING INSTALLATION

- A. General: Installation procedures shall meet or exceed the manufacturer's recommendations and ASTM C 636.
 - 1. Lay out each area so that the panel patterns are symmetrical, joints parallel to walls and borders generally equal in width.
 - 2. Coordinate the patterns with ceiling lights and grilles in conformance with the reflected ceiling plans and as directed.
 - 3. Verify types and sizes of light fixtures and grilles to be accommodated and arrange the work accordingly.
- B. Suspension: Locate main and cross tee runners to form the indicated patterns.
 - 1. Use a laser leveling method to direct-suspend the main tees with hangers spaced not more than 48" o.c.
 - 2. Provide hangers within 6" of the corners of recessed lighting fixtures.
 - 3. Under steel construction, wrap hangers around or clip or bolt hangers to a structural steel member (not steel deck).
 - 4. Under bar joists, suspend hangers from top chord or from bottom chord at panel points only.
 - 5. Under ductwork, employ trapeze system for hanging ceiling.
 - 6. Do not suspend hangers from ducts, piping, conduit, or fireproofing membrane.
 - 7. Use a laser beam system to level the main tee runners to within 1/8" in 12 ft. Level with hangers taut; do not make kinks or bends in hangers as a means of leveling.
- C. Moldings: Install finish channel and angle moldings where ceilings abut walls, furrings and other intersecting vertical surfaces.
 - 1. Moldings shall be in long lengths, secured to adjoining surfaces with at least two fasteners for each piece or more as may be required. Pull the molding snugly against the vertical surface without any gaps.
 - 2. No molding length shall be less than 3 ft. except at short offsets.
 - 3. Use prefabricated corner pieces where possible to eliminate field mitering.
- D. Lay-in Panels: Install the acoustic panels in the exposed suspension system with bottom surfaces flush and in a true, level plane.
 - 1. Hold-down clips are required at all vinyl covered gypsum panels for cleaning purposes.
 - 2. Provide hold-down clips at lay-in panels within 6' of exterior exits.
- E. Access: Provide access through acoustic panel ceilings with one or more access locations in each room to maintain a maximum spacing of 30 ft. between access panels.
- F. Light Fixture Protection: Provide incombustible enclosures over recessed light fixtures as required to attain the specified Time-Design fire Rating. Fixture protection shall be in accordance with UL Design selected.

3.3 TOLERANCES

- A. Variation from flat and level surface: 1/8 inch in 10 ft.
- B. Variation from plumb of grid members caused by eccentric loads: Two degrees (2°) maximum.

3.4 ADJUSTING AND PATCHING

- A. Replace damaged members of exposed suspension system. Replace ceiling board and tile that is damaged, installed improperly, or shows visible signs of sagging.

3.5 CLEANING

- A. After installation, clean soiled and discolored surfaces. Remove damaged units and replace with new.

END OF SECTION

SECTION 09 54 23

LINEAR METAL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Linear metal ceiling system
 - 2. Suspension systems for ceilings
 - 3. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings
 - 4. Perimeter Trim
 - 5. Interior and exterior installations
- B. Related Sections:
 - 1. 09 51 00 - Acoustical Ceilings.
 - 2. Division 21 - Fire Suppression; fire sprinkler heads and trim.
 - 3. Division 23 - Heating, Ventilating, and Air Conditioning; HVAC distribution components.
 - 4. Division 26 - Electrical

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For components with factory-applied color and other decorative finishes.
- C. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below:
 - 1. Linear Metal Ceiling: Set of 12-inch long Samples of each type and color and a 12-inch long spliced section.
 - 2. Suspension System Members: 12-inch long Sample of each type, including main runner and 4 foot cross tees.
 - 3. Exposed Molding and Trim: Set of 12-inch long Samples of each type, finish, and color.
 - 4. End Cap and Panel Splice: Full size.
- D. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Linear pattern.
 - 2. Joint pattern.
 - 3. Ceiling suspension members.
 - 4. Method of attaching hangers to building structure.
 - 5. Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers, and access panels.
 - 6. Ceiling perimeter and penetrations through ceiling; trim and moldings.
 - 7. Minimum Drawing Scale: 1/4 inch = 1 foot.
 - 8. Maintenance Data: For finishes to include in maintenance manuals.

1.3 QUALITY ASSURANCE

- A. Subcontractor Qualifications: Installer shall have not less than three years of successful experience in the installation of linear metal ceiling systems on projects with requirements similar to requirements specified.
- B. Source Limitations: Single-source responsibility: Provide acoustical panel units and grid components by a single manufacturer.
- C. Surface-Burning Characteristics: Complying with ASTM E 1264 for Class A materials, as determined by testing identical products according to ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
- D. 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.

- E. Pre-installation Conference: Conduct conference at Project site, with Architect present. Coordinate acoustical ceiling work with installers of related work including, but not limited to building insulation, gypsum board, light fixtures, mechanical systems, electrical systems, and sprinklers.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical ceiling units, 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 ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units, suspension system components, and accessories carefully to avoid damaging units and finishes in any way.

1.5 PROJECT CONDITIONS

- A. Interior Environmental Limitations: Do not install linear metal ceilings until spaces are enclosed and weathertight, 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. Climate condition range of 60-degrees F to 85-degrees F and relative humidity of not more than 70 percent.
- B. Mechanical Work: Ductwork above ceiling shall be complete, and permanent heating and cooling systems operating to climate conditions prior to installation of linear metal ceiling components.
- C. Electrical Work: Installation of conduit and fire alarm components above ceiling shall be complete before installation of linear metal ceiling components.
- D. Fire Protection Work: Fire protection lines and/or equipment occurring above ceiling shall be completed and tested before linear metal ceiling components are installed.
- E. Exterior Work: For exterior applications, do not install linear metal ceilings until all exterior wall finish(s) are installed and final cleaning has occurred. Also, do not install until all fascia trim has been installed.

1.6 COORDINATION

- A. Coordinate layout and installation of linear metal pans 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.

1.7 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Linear Metal Ceiling Components: Quantity of each panel, carrier, accessory, and exposed molding and trim equal to 2 percent of quantity installed.

1.8 WARRANTY

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to the following:
 1. Acoustical Panels: Sagging and warping.
 2. Grid System: Rusting and manufacturer's defects.
- B. Warranty Period:
 1. Acoustical Metal panels: One (1) year from date of substantial completion.

2. Grid: One (1) year from date of substantial completion.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Provide linear metal ceiling, custom trims and suspension system by the following:
USG
Armstrong World Industries, Inc.
Innovative Architectural Solutions

2.2 ALUMINUM PANS AND SUSPENSION SYSTEM FOR LINEAR METAL CEILING

- A. Aluminum Panels and Suspension System: Basis of Design shall be Innovative Architectural Solutions; Linea - Strip System. Subject to compliance with requirements, the following will be acceptable:
Innovative Architectural Solutions; Linea - Strip System
USG; Paraline Linear Metal System
Armstrong World Industries, Inc.; Metalworks Linear
Classification: Units complying with Fire Class – Class A, ASTM E 1264 for:
1. Unperforated at Exterior of the Building – Type Paraline II,
2. Perforated – Type Paraline I, Perforation Pattern A062
- B. Panel Edge Detail: Manufacturer's standard edge detail.
- C. End Cap, Finish of Exposed Portions: To match panel.
- D. Suspension-System Main-Carrier Material: Hot-dip galvanized steel.
- E. At Interior Locations: Provide 1" Glass Fiber Insulation. System shall have a NRC of .75-.85.
- F. At Exterior Locations:
1. Provide panels that meet wind uplift class of 90 minimum and install per manufacturer's recommendations to meet wind speed of 120 mph.
2. Panels shall be finished on both sides for exterior applications.
3. No perforations at exterior conditions.

2.3 LINEAR METAL CEILING PANS

- A. Sheet Metal Characteristics: For metal components 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, roughness, stains, or discolorations.
1. Aluminum Sheet: Electrogalvanized steel – thickness 0.024" to 0.028".
2. Noise Reduction Coefficient (NRC): ASTM C 423; Classified with UL label on product carton 0.70
- B. Panel Fabrication: Manufacturer's standard units of size, profile, and edge treatment indicated, formed from metal indicated to snap on and be securely retained on carriers without separate fasteners, and finished to comply with requirements indicated.
- C. Panel Splices: Construction same as pans, in length per manufacturer; with finish to match panels.
- D. End Caps: Metal matching panels; fabricated to fit and conceal exposed ends of panels.
- E. Moldings and Trim: Provide manufacturer's standard moldings and trim for exposed members, and as indicated or required, for edges and penetrations of ceiling, around fixtures, at changes in ceiling height, and for other conditions; of same metal and finish as linear metal ceiling pans.

2.4 METAL SUSPENSION SYSTEMS

- A. Metal Suspension Systems Standard: Provide ceiling manufacturer's standard metal suspension systems of types and finishes indicated that comply with applicable ASTM C 635 requirements.

- B. Suspension Systems: Provide systems complete with carriers, splice sections, connector clips, alignment clips, leveling clips, hangers, molding, trim, retention clips, load-resisting struts, fixture adapters, and other suspension components required to support ceiling units and other ceiling-supported construction.
- C. Wire Hangers, Braces, and Ties: Provide wire complying with the following requirements:
 - 1. 12 gauge hanger wire.
- D. Carrier Splices: Same metal, profile, and finish as indicated for carriers.
- E. Stabilizer Channels, Tees, and Bars: Manufacturer's standard components for stabilizing main carriers at regular intervals and at light fixtures, air-distribution equipment, access doors, and other equipment; spaced as standard with manufacturer for use indicated; and factory finished.
- F. Edge Moldings and Trim: Provide exposed members as required to comply with seismic requirements of authorities having jurisdiction, to conceal edges of penetrations through ceiling, to conceal ends of pans and carriers, for fixture trim and adapters, for fascia at changes in ceiling height, and for other conditions; of metal and finish matching linear metal panels.

2.5 ACCESSORIES

- A. Access Panels: If access must be provided at metal ceiling, provide manufacturer's access door kit, including door hinge assembly, retainer clip, and retainer bar, assembled with ceiling panels and carrier sections into access doors of required size, permitting upward or downward opening. Confirm location(s) of access panels with Architect prior to installation or ceiling modification.

2.6 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- D. Exterior panels are to be finished on both sides.

2.7 ALUMINUM FINISHES

- A. Color-Coated Finish: Manufacturer's paint finish complying with coating manufacturer's written instructions for surface preparation, pretreatment, application, baking, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing and substrates to which linear metal 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 linear metal ceilings.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

- B. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
 - 1. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.3 INSTALLATION

- A. Follow manufacturer installation instructions
- B. Install suspension system and panels in accordance with the manufacturer's instructions, and in compliance with ASTM C 636 and with the authorities having jurisdiction.
- C. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps.
- D. For reveal edge panels: Cut and reveal or rabbet edges of ceiling panels at border areas and vertical surfaces.
- E. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.
- F. At exterior locations, do not install linear metal ceilings until all wall finishes have been installed and final cleaning has occurred. Also, do not install at exterior locations until all prefinished metal fascia, coping and gutters have been installed and before downspouts are attached.

3.4 CLEANING

- A. Clean exposed surfaces of linear metal ceilings, including trim and edge moldings after removing strippable, temporary protective covering if any. Comply with manufacturer's written instructions for stripping of temporary protective covering, 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, including dented and bent units.

END OF SECTION

SECTION 09 65 00

RESILIENT FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Vinyl composition tile flooring, rubber base, and accessories.

1.2 SUBMITTALS

A. Samples: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. Submit manufacturer's standard color samples of tile, not less than 3" x 3", full thickness. Submit samples of each accessory, full height or width by not less than 2" length.

B. Concrete Slab Testing

1. Alkalinity and Adhesion Testing:

- a. Submit result of pH tests.
- b. Submit written documentation of acceptable pH levels of selected flooring manufacturer.
- c. Submit letter from flooring manufacturer stating that floor alkalinity is acceptable and manufacturer will issue warranty.
- d. Proceed with installation only after substrates pass testing.

2. Relative Humidity Probe Tests:

- a. Submit results for in situ relative humidity probe tests.
- b. Submit date and time measurements were made.
- c. Submit locations and depth of probe holes.
- d. Submit temperature and relative humidity in each probe hole.
- e. Submit ambient air temperature.
- f. Acceptable relative humidity is typically 75% or less. Submit written documentation of tolerances for selected flooring manufacturer. Proceed with installation only after substrates have relative humidity percentage stated as acceptable by manufacturer.
- g. Submit letter from flooring manufacturer stating that relative humidity is acceptable and manufacturer will issue warranty.

3. Anhydrous Calcium Chloride Testing

- a. Submit time and date of placement and retrieval.
- b. Submit ambient air temperature and humidity during test duration
- c. Submit manufacturer's instructions and relative technical data.
- d. Acceptable moisture emission rates are typically 3 lbs. per 1000 sq. ft. or less, in 24 hours. Submit written documentation of tolerances for selected flooring manufacturer. Proceed with installation only after substrates have maximum moisture-vapor-emission rate as stated by manufacturer.
- e. Submit letter from flooring manufacturer stating that floor moisture emission rates are acceptable and manufacturer will issue warranty.

1.3 QUALITY ASSURANCE

A. Installation Conference:

1. At least one week prior to the start of flooring installation, the contractor shall convene a pre-installation conference at the project site.
2. Attendance is required by the Contractor, installer, and manufacturer's technical representative. The Architect and Owner shall be invited.
3. Review requirements for work and conditions which could possibly interfere with successful performance of work.

B. Color Uniformity: Provide flooring from the same manufacturer.

1.4 DELIVERY

A. Deliver floor materials to the project site in unbroken containers and cartons bearing the manufacturer's labels.

B. Deliver resilient floor materials to an acclimatized building at least 36 hours prior to installation of vinyl composition tile **and 48 hours for installation of rubber products.**

1.5 PROJECT CONDITIONS

- A. Environmental Requirements: Maintain the temperature inside the building reasonably constant at not less than 65°F. for 48 hours before installation, during installation, and for 48 hours after installation.
- B. After installation, maintain temperatures within range recommended by manufacturer, but not less than 55°F. or more than 95°F.

1.6 WARRANTY

- A. Vinyl Composition Tile Warranty Terms: Standard 5-year manufacturer's warranty on defective materials. Reasonable labor costs will be reimbursed at 100% if the defect is reported within the first year of the original purchase, and at 50% if the defect is reported within the second year of the original purchase. Labor costs will not be reimbursed if the defect is reported within the third, fourth, or fifth year of the original purchase.
- B. Rubber Base Warranty: Provide Standard 2-year manufacturers' warranty that materials is free from manufacturing defects.

1.7 MAINTENANCE

- A. Extra Materials: Upon completion of work, deliver to the Owner's maintenance facility not less than one box or fraction thereof for each type, field color, pattern, and size installed and one box or fraction thereof for each type, accent color, pattern, and size installed. Furnish maintenance materials from same manufactured lot as materials installed and enclose in protective packaging with appropriate identifying labels.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Vinyl Composition Tile (VCT-01): ASTM F 1066, Class 2 (through-pattern tile), 12" x 12" x 1/8" thick vinyl composition tile. Basis of Design is "VCT II" as manufactured by Tarkett or approved equivalent. Color as scheduled in "Material Finish Schedule" in drawings.
- B. Rubber Base: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Style Cove (with top-set toe), 1/8" thick, 4" high. Color(s) as scheduled in "Material Finish Schedule". Furnish base in manufacturer's continuous rolls. Outside corners shall be factory formed pre-molded units matching base in color and finish. Product/manufacturer; one of the following:
 - Wallflowers® Premium Wall Base; Flexco
 - Baseworks™ Thermoset Rubber Wall Base; Tarkett/Johnsonite
 - Pinnacle Type TS Rubber Base; Roppe Rubber Corp.NO SUBSTITUTIONS on Type TS (rubber, vulcanized thermoset)
- C. Edge Strips: 1" wide by 1/8" thick black rubber tile reducer with beveled surface.
- D. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic cement based formulation provided or approved by vinyl composition tile manufacturer.
- E. Adhesive: Moisture-resistant type recommended by flooring manufacturer.
- F. Cleaner: Neutral, chemical cleaner such as Hillyard "Super Shine-All" designed to be safe to use on any surface not damaged by water.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive resilient flooring, base, and accessories for conditions that will adversely affect the execution and quality of work. Do not start this work until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Testing of concrete slabs

1. Anhydrous Calcium Chloride Testing

- a. Conduct anhydrous calcium chloride testing per ASTM F1869, modified to include testing over concrete containing lightweight aggregate.
- b. Environmental requirements of area to be tested are to match that of the finished floor covering. Doors, windows, roofing, etc. must be installed and the temperature of the building controlled to a finished building atmosphere. Ensure interior building climate is 75 degrees F \pm 10 degrees F and 50% Relative Humidity \pm 10% for 72 hours prior to, and throughout the duration of the tests.
- c. The number of test kits required is determined by the square footage of areas scheduled to receive finish flooring. A minimum of three test kits are required in the first 1,000 sq. ft. a minimum of one test kit per each additional 1,000 sq. ft. with consideration given to separation of test areas. Time of exposure is a minimum of 60 hours and a maximum of 72 hours.
- d. A prepackaged calcium chloride test kit is equipped with a sealed dish of anhydrous calcium chloride, a metering dome with gasket and instructions.
 - 1) Clean substrate in area to be tested by removing dust solvent, paint, wax, oil, grease, residual adhesive, adhesive removers, curing, sealing, hardening, or parting compounds, alkaline salts, excessive carbonation, or laitance, mold mildew and other foreign materials.
 - 2) Weigh the tape sealed dish on a gram scale with 1/10th gram gradation. Record start weight, date and time on dish's label and instruction document.
 - 3) Unseal dish and expose test according to preprinted test kit instructions.
 - 4) Allow 60 to 72 hours of exposure. Retrieve test dish re-seal and re-weigh according to instructions.
 - 5) Provide a diagram of the building, with calculations, documenting each test location with its results in writing.
- e. Acceptable moisture emission rates are typically 3 lbs. per 1000 sq. ft. or less, in 24 hours; however, submit written tolerances for selected flooring manufacturer. Proceed with installation only after substrates have maximum moisture-vapor-emission rate as stated by manufacturer.
- f. Submit letter from flooring manufacturer stating that floor moisture emission rates are acceptable and manufacturer will issue warranty.

2. In Situ Relative Humidity Probe Test:

- a. Conduct in situ relative humidity probe testing per ASTM F2170.
- b. Concrete floor slabs shall be at the service temperature and the occupied air space above the slab shall be at the service temperature service relative humidity for at least 48 hours before taking relative humidity measurements in the concrete slab.
- c. Perform 3 tests for the first 1,000 sq/ft. and a minimum of 1 test for every 1,000 sq/ft. thereafter.
- d. For slabs on-grade and below-grade choose a testing location within 3 feet of each exterior wall.
- e. Drill probe holes 40% into depth of slab for slabs drying from the top only and 20% into the slab for slabs drying from top and bottom.
- f. Remove dust from hole using vacuum cleaner and allow 72 hours to achieve moisture equilibration within hole before taking relative humidity measurements.
- g. After inserting probe allow necessary amount of time for probe to reach temperature equilibrium before measuring relative humidity.
- h. Use the relative humidity probe to measure the ambient air temperature and relative humidity above the slab in the vicinity of the hole.
- i. Proceed with installation only after substrates pass testing.
- j. Submit letter from flooring manufacturer stating that floor relative humidity percentage is acceptable and manufacturer will issue warranty.

3. Alkalinity and Adhesion Testing

- a. Conduct pH test per ASTM F710.
- b. Test for alkalinity prior to installation of flooring materials.
- c. pH levels shall not exceed the written recommendation of the flooring manufacturer and the adhesive manufacturer.
- d. A pH range of 5-9 is optimum, not to exceed 9 pH. Submit written acceptable pH levels of selected flooring manufacturer.
- e. Proceed with installation only after substrates pass testing.
- f. Submit letter from flooring manufacturer stating that floor alkalinity is acceptable and manufacturer will issue warranty.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners. Surfaces shall be clean and dry before flooring is laid.

2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
3. Sweep the surfaces free of dust and dirt and remove oil, grease, paint, dried mortar and curing compound residue.
4. Fill low spots, cracks, minor holes and crevices in concrete floors with latex underlayment patching material. Re-surface rough and irregular surfaces with the same underlayment material.

3.3 INSTALLATION

A. Laying Flooring:

1. Install floor tile in straight joint pattern as directed and in conformance with the manufacturer's recommended procedure.
2. Start at centerlines of spaces and adjust borders to maintain full tiles in the field and equal borders. Except as required in irregularly shaped areas, no tile shall be less than one-half the width of field tile, and in no event shall any tile piece be less than 3" wide.
3. Install tile to square grid pattern with all joints aligned, with pattern grain alternating with adjacent unit to produce basket weave pattern. Allow minimum 1/2 full size tile width at room or area perimeter. Lay tile starting at center of room working toward walls, square with room axis. Joints shall be tight butt joints, true to line.
4. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.
5. Install edge strips at unprotected or exposed edges and where flooring terminates.
6. Bed tile firmly and maintain joints tight, straight, and square with the room axes. The completed surfaces shall be free of buckles, waves, and projecting tile. Scribe tiles neatly at columns, corners, and casework.
7. Where flooring edges are not concealed by thresholds or other materials, install rubber edge strips.
8. After floor tile has been installed, mark and cut out spaces for court striping and inlay accent color as striping. Insure that the factory applied top layer is not compromised.

B. Applying Rubber Base:

1. Install coved base after the floor tile, mat, and carpet have been laid. Do not use less than manufacturer's continuous rolls, except where required for last piece in any one run of wall length.
2. Apply base with adhesive covering 100% of the back surface, not just in spots. Apply adhesive with a notched trowel. Use headless brads in addition to adhesive where required. Use preformed outside corners and miter inside corners. Joints shall be tight.
3. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.

3.4 PROTECTION

A. Prohibit traffic on floor finish for 48 hours after installation.

B. Repair or replace damaged surfaces that are soiled or scarred in a manner acceptable to the Owner.

3.5 CLEANING

A. Clean in accordance with Section 01 74 13 - PROGRESS CLEANING.

1. Remove excess adhesive and other foreign matter from tile flooring and base.
2. Scrub floor with cleaner in conformance with manufacturer's instructions and rinse.
3. Replace defective or loose material.

END OF SECTION

SECTION 09 68 13

TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Carpet tile, including the following:
 - 1. Surface preparation.
 - 2. Glue down carpeting on floor surfaces.
 - 3. Walk-off carpeting.
 - 4. Accessories, including edge strips.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-In-Place Concrete.
 - 2. Section 09 65 00 - Resilient Flooring: rubber base.

1.2 SUBMITTALS

- A. Product Data: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
 - 1. Provide manufacturer's installation instructions, including manufacturer's approved adhesive to be used for installation of carpet tile.
 - 2. Provide certification of manufacturer's approval of adhesive.
- B. Product data for each type of carpet material and accessory required. Products proposed must meet or exceed the specifications identified in this section. Submit manufacturer's technical specifications, published standard warranty, attached comparative checklist, and the following manufacturer's test reports:
 - 1. Methenamine Pill Test (DOC FF #1-70), Rating Pass.
 - 2. Flooring Radiant Panel Test, NFPA-253, ASTM E 648.
 - 3. Smoke Density, NBS Smoke Density Chamber NFPA-258, 450 or less.
 - 4. Static Test, AATCC Test Method 134-1979, 2.5KV or below under standard test conditions 70°F., 20% R.H.
- C. Samples for verification purposes in manufacturer's standard size, showing full range of color, texture, and pattern variations expected. Prepare samples from material to be used for the work. Submit the following:
 - 1. 12" square samples of each type of carpet material required.
 - 2. 12" long samples of each type of exposed edge striping and accessory item.
- D. Maintenance Manual: Provide 2 copies of a printed maintenance manual, written by the carpet manufacturer's Technical Service Department delivered to the Owner at the project site. Include the following:
 - 1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 - 2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.
- E. Concrete Slab Testing
 - 1. Alkalinity and Adhesion Testing:
 - a. Submit result of pH tests.
 - b. Submit written documentation of acceptable pH levels of selected flooring manufacturer.
 - c. Submit letter from flooring manufacturer stating that floor alkalinity is acceptable and manufacturer will issue warranty.
 - d. Proceed with installation only after substrates pass testing.
 - 2. Relative Humidity Probe Tests:
 - a. Submit results for in situ relative humidity probe tests.
 - b. Submit date and time measurements were made.
 - c. Submit locations and depth of probe holes.
 - d. Submit temperature and relative humidity in each probe hole.
 - e. Submit ambient air temperature.
 - f. Acceptable relative humidity is typically 75% or less. Submit written documentation of tolerances for selected flooring manufacturer. Proceed with installation only after substrates have relative humidity percentage stated as acceptable by manufacturer.

- g. Submit letter from flooring manufacturer stating that relative humidity is acceptable and manufacturer will issue warranty.
- 3. Anhydrous Calcium Chloride Testing
 - a. Submit time and date of placement and retrieval.
 - b. Submit ambient air temperature and humidity during test duration
 - c. Submit manufacturer's instructions and relative technical data.
 - d. Acceptable moisture emission rates are typically 3 lbs. per 1000 sq. ft. or less, in 24 hours. Submit written documentation of tolerances for selected flooring manufacturer. Proceed with installation only after substrates have maximum moisture-vapor-emission rate as stated by manufacturer.
 - e. Submit letter from flooring manufacturer stating that floor moisture emission rates are acceptable and manufacturer will issue warranty.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in carpet manufacturing with 5 years minimum experience.
- B. Installer: Company specializing in installing carpet with minimum five years (5) documented experience and must be certified by manufacturer specified. Use for installation only personnel who are skilled in the work required, familiar with the manufacturer's recommended methods required for installation.
- C. Installer Qualifications: An experienced installer with 3 years minimum documented experience in carpeting installations of similar scope.
- D. Manufacturer's technical representative to visit project site once carpet installation has begun and shall provide written certification letter indicating that the carpet installation is in accordance with manufacturer's recommendations.
- E. Manufacturer's representative shall provide training session with Owner's maintenance personnel regarding care and cleaning procedures for completed carpet installation.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Carpet tile shall be delivered to the project site in manufacturer's standard boxes. Each box shall have register number permanently attached to box.
- B. Store materials for 3 days prior to installation in the areas of installation to achieve temperature stability.

1.5 SITE CONDITIONS

- A. Measurements: Dimensions supplied on the drawings are approximate. Contractor shall carefully check all dimensions and other conditions affecting his work in the field and shall be responsible for proper installation.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Temperature and Humidity: Carpet must be installed when the indoor temperature is between 65°F. and 95°F. with a maximum relative humidity of 65%. If ambient temperatures are outside these parameters, the installation must not begin until the HVAC system is operational and these conditions are maintained at least 48 hours before, during, and 72 hours after completion.
- B. Provide sufficient lighting.
- C. Manufacturer to off gas carpet at their facilities prior to shipping to job site.
- D. Ventilate installation area during installation and three (3) days after installation.
- E. Ventilation: During installation, maintain fresh air ventilation using exhaust fans, and be operating the ventilation system at full capacity. Always exhaust air to the outside and avoid re-circulation. After installation, maintain fresh air ventilation for 48 to 72 hours at normal room temperatures by operating the ventilation or exhaust fan system at full capacity.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit operation and maintenance data under provisions of SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA.
- B. Include maintenance procedures, recommended maintenance materials and suggested schedule for cleaning and shampooing.

1.8 WARRANTIES

- A. Manufacturer's Lifetime Commercial Limited warranty, non-prorated, against manufacturing defects covering all costs including freight, labor, and material for the following:
 - 1. Edge Ravel - wet or dry.
 - 2. Back delamination, wet or dry.
 - 3. Loss of 20 lb. average tuft bind - wet or dry.
 - 4. Static protection - 3.0 KV when tested under the Standard Shuffle Test, 70 F - 20% RH
 - 5. Wear - No more than 10% face yarn loss.
 - 6. Adhesive failure.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. (CPT-01) Walk-off Carpet: Provide "Obex Tile" with PVC-Free Comfort Plus ES Cushion backing as manufactured by Milliken. Carpet shall meet the following minimum requirements, NO EXCEPTIONS:
 - 1. Color shall be as scheduled in "Material Finish Schedule" in drawings.
 - 2. Construction: Tufted Cut Pile
 - 3. Yarn Content: Nylon, Type 6,6 and 6
 - 4. Dye Method: Millitron
 - 5. Face Weight: 24 oz per sq. yd.
 - 6. Gauge: 5/32
 - 7. Stitches per Inch: 9.5 stitches per Inch.
 - 8. Pile Height Average: 0.186-inch
 - 9. Density: 4,684
- B. Substrate Filler: As recommended by adhesive and carpet tile manufacturer; compatible with substrate.
- C. Substrate Primer and Sealer: Type as recommended by carpet tile manufacturer.
- D. Adhesive: Moisture-resistant type as recommended by the carpet tile manufacturer.
- E. Edge Strips: Provide two-piece vinyl, 1/4" leg, Joining Moulding, No. 940 'T' with No. 970 Track, and provide No. 356 'T', where 1/2" leg is required, as manufactured by BurkeMercer Products (phone 800.669.7010 web site: www.burkflooring.com). Color(s) as selected by Architect.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Before commencement of any work the Contractor shall inspect the floors to receive carpet tile to determine the condition of those surfaces, and shall furnish and apply suitable primer and otherwise prepare floor surfaces in accordance with the carpet tile manufacturer's instruction.

3.2 PREPARATION

- A. Testing of concrete slabs
 - 1. Anhydrous Calcium Chloride Testing
 - a. Conduct anhydrous calcium chloride testing per ASTM F1869, modified to include testing over concrete containing lightweight aggregate.
 - b. Environmental requirements of area to be tested are to match that of the finished floor covering. Doors, windows, roofing, etc. must be installed and the temperature of the building controlled to a finished building atmosphere. Ensure interior building climate is 75 degrees F \pm 10 degrees F and 50% Relative Humidity \pm 10% for 72 hours prior to, and throughout the duration of the tests.

- c. The number of test kits required is determined by the square footage of areas scheduled to receive finish flooring. A minimum of three test kits are required in the first 1,000 sq. ft. a minimum of one test kit per each additional 1,000 sq. ft. with consideration given to separation of test areas. Time of exposure is a minimum of 60 hours and a maximum of 72 hours.
 - d. A prepackaged calcium chloride test kit is equipped with a sealed dish of anhydrous calcium chloride, a metering dome with gasket and instructions.
 - 1) Clean substrate in area to be tested by removing dust solvent, paint, wax, oil, grease, residual adhesive, adhesive removers, curing, sealing, hardening, or parting compounds, alkaline salts, excessive carbonation, or laitance, mold mildew and other foreign materials.
 - 2) Weigh the tape sealed dish on a gram scale with 1/10th gram gradation. Record start weight, date and time on dish's label and instruction document.
 - 3) Unseal dish and expose test according to preprinted test kit instructions.
 - 4) Allow 60 to 72 hours of exposure. Retrieve test dish re-seal and re-weigh according to instructions.
 - 5) Provide a diagram of the building, with calculations, documenting each test location with its results in writing.
 - e. Acceptable moisture emission rates are typically 3 lbs. per 1000 sq. ft. or less, in 24 hours; however, submit written tolerances for selected flooring manufacturer. Proceed with installation only after substrates have maximum moisture-vapor-emission rate as stated by manufacturer.
 - f. Submit letter from flooring manufacturer stating that floor moisture emission rates are acceptable and manufacturer will issue warranty.
 - 2. In Situ Relative Humidity Probe Test:
 - a. Conduct in situ relative humidity probe testing per ASTM F2170.
 - b. Concrete floor slabs shall be at the service temperature and the occupied air space above the slab shall be at the service temperature service relative humidity for at least 48 hours before taking relative humidity measurements in the concrete slab.
 - c. Perform 3 tests for the first 1,000 sq/ft. and a minimum of 1 test for every 1,000 sq/ft. thereafter.
 - d. For slabs on-grade and below-grade choose a testing location within 3 feet of each exterior wall.
 - e. Drill probe holes 40% into depth of slab for slabs drying from the top only and 20% into the slab for slabs drying from top and bottom.
 - f. Remove dust from hole using vacuum cleaner and allow 72 hours to achieve moisture equilibration within hole before taking relative humidity measurements.
 - g. After inserting probe allow necessary amount of time for probe to reach temperature equilibrium before measuring relative humidity.
 - h. Use the relative humidity probe to measure the ambient air temperature and relative humidity above the slab in the vicinity of the hole.
 - i. Proceed with installation only after substrates pass testing.
 - j. Submit letter from flooring manufacturer stating that floor relative humidity percentage is acceptable and manufacturer will issue warranty.
 - 3. Alkalinity and Adhesion Testing
 - a. Conduct pH test per ASTM F710.
 - b. Test for alkalinity prior to installation of flooring materials.
 - c. pH levels shall not exceed the written recommendation of the flooring manufacturer and the adhesive manufacturer.
 - d. A pH range of 5-9 is optimum, not to exceed 9 pH. Submit written acceptable pH levels of selected flooring manufacturer.
 - e. Proceed with installation only after substrates pass testing.
 - f. Submit letter from flooring manufacturer stating that floor alkalinity is acceptable and manufacturer will issue warranty.
- B. Delay installation until all surrounding work, including painting, has been completed. Vacuum substrate immediately prior to carpet tile installation and remove all deleterious substances which would interfere with installation or be harmful to the work.
- C. Ensure floors are level, with maximum surface variation of 1/4 inch in 10 feet non-cumulative. Inspect subflooring for cracks, holes, abrasions, rough spots, ridges, or other conditions which will adversely affect execution and quality of work.
- D. Ensure concrete floors are free from scaling and irregularities and exhibit neutrality relative to acidity and alkalinity.
- E. Use an approved cementitious filler to patch cracks, small holes and for leveling.

- F. Notify Architect in writing of any condition which will prevent satisfactory completion of work. Do not proceed until such defects are entirely corrected. Application or installation of carpet tile shall constitute acceptance of sub-floors.

3.3 INSTALLATION

- A. General: Comply with CRI Carpet Installation Standard 2011, "Modular Carpet." (Tiles)
- B. Lay carpet tile on floors in direction as directed by Architect.
- C. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- D. Extend carpet tile under open-bottomed and raised-bottom obstructions, and under removable flanges of obstructions. Extend carpet tile into closets and alcoves of rooms indicated to be carpeted, unless another floor finish is indicated for such spaces. Extend carpet tile under all movable furniture and equipment.
- E. Vacuum clean substrate. Spread adhesive in quantity recommended by manufacturer after primer application to ensure proper adhesion over full area of installation. Apply only enough adhesive to permit proper adhesion of carpet tile before initial set.

3.4 CLEANING

- A. Remove excess adhesive from floor, base and wall surfaces without damage.
- B. Clean and vacuum carpet tile surfaces.

3.5 PROTECTION

- A. Prohibit traffic from carpet tile areas for 24 hours after installation.

END OF SECTION

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SECTION 09 72 21

SANITARY WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Pre-finished fiberglass reinforced panels (FRP).

1.2 SUBMITTALS

- A. General: Submit in accordance with Section 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, SAMPLES.
- B. Samples: Submit sample of each type of panel.
- C. Maintenance Instructions: Submit copies of the manufacturer's printed instructions for maintenance of the installed work.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing commercial pre-finished panels with 5 years documented experience.
- B. Applicator Qualifications: Work shall be performed by a skilled applicator having at least five years experience in the installation of pre-finished panels.
- C. Source Quality Control: Flame spread rating of the material shall be determined by ASTM E 84. Each roll of goods delivered to the project shall bear Underwriters' Laboratories labels.

1.4 REGULATORY REQUIREMENTS

- A. Conform to applicable building code for flame spread/fuel contribution/smoke development ratings when tested to ANSI/ASTM E 84.

1.5 ENVIRONMENTAL CONDITIONS

- A. Building should be fully enclosed prior to installation with sufficient heat and ventilation.
- B. Room temperature during installation must be 70°F. or above.
- C. Panels should be allowed to equalize to the moisture in the room environment prior to installation.

1.6 DELIVERY AND STORAGE

- A. Materials should be stored lying flat, under cover and protected from the elements. Panels should be allowed to acclimate to the room conditions for 48 hours prior to installation.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Prefinished Panels
 - 1. Provide FRP Panels as manufactured by Marlite or approved equivalent.
 - 2. Finish: Color and finish as selected by Architect from manufacturer's full color and pattern range.
- B. Moldings and Trim Pieces: Inside Corner, Division and End Cap moldings. Provide all moldings required for a complete installation.
- C. Adhesive: Type and brand recommended by the panel manufacturer.

- D. Sealant: Silicone sealant as recommended by the panel manufacturer.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine areas to receive panels for conditions that will adversely affect the execution and quality of work. Do not start this work until unsatisfactory conditions are corrected.
- B. Verify that substrate surfaces are clean, dry, solid, straight, and free from drywall dust, bumps, projections, loose plaster, or paint.
- C. Beginning of installation means acceptance of substrate.

3.2 INSTALLATION

- A. Applying Panels: Follow the manufacturer's printed instructions for cutting and installing panels.
 - 1. Moldings can be applied by coated lath nails and/or adhesive. If nails only are used, backing materials must have nail holding capabilities or nails must be long enough to penetrate into furring or framing.
 - 2. All panel edges inside and outside corners are to finished with moldings appropriate to that purpose.
 - 3. All molding channels and joints between the system and different materials will be sealed with silicone sealant.
 - 4. Adhesive will be applied in strict accordance with the manufacturer's instructions and under conditions recommended as appropriate to the specific adhesive being used.
 - 5. Do not make panel joints directly over drywall joints.
 - 6. Do not fit panels too tightly in moldings. Allow at least 1/8" in all channels for panel expansion after installation is completed.

3.3 CLEANING

- A. Clean panels with mild soap and water to remove excess adhesive/sealant at joints and on adjacent surfaces.

3.4 PROTECTION

- A. Protect finished installation under provisions of Section 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS.

3.5 DEFECTS

- A. Replace panels applied to defective substrate surfaces. Correct defects in completed installation.

END OF SECTION

SECTION 09 72 26

CUSTOM DIGITAL WALLCOVERING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Custom digital wallcovering.
- B. Related Sections:
 - 1. Section 09 21 16 - Gypsum Board Assemblies; level 5 finish of gypsum board walls.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 – SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Samples:
 - 1. Submit "mini-mural" of complete finished image printed on actual substrate specified.
 - 2. Submit sample section, 12" x 12", of final image at 100% resolution printed on actual substrate specified.
- C. Manufacturer's Data: For each type of digital wallcovering proposed for use on the project, submit complete description of each wallcovering, including: pattern, total weight, fabric backing, tensile strength, tear strength, and fire hazard classification.

1.3 QUALITY ASSURANCE

- A. Imperfections such as engraving roller die marks, roller repeat marks or other features deemed not in conformance with the specified materials, will be cause for rejection.
- B. Applicators Qualifications: Work of this section shall be performed by a firm regularly engaged in the installation of vinyl wallcoverings of the types and qualities specified.

1.4 PROJECT SITE CONDITIONS

- A. Temperatures
 - 1. Maintain substrate surface and ambient temperatures above 65°F., unless required otherwise by manufacturer's instructions.
 - 2. Do not apply adhesive when substrate surface temperature or ambient temperature is below 65°F.
 - 3. Maintain these conditions 72 hours before, during, and after installation of vinyl wallcovering.
- B. Lighting: Provide not less than 80 foot-candles per square foot minimum, on the surfaces to receive wallcoverings.
- C. Wall Condition
 - 1. The wall surface should be clean, dry, structurally sound, and free of mildew, grease, dust, or other stains.
 - 2. Room humidity should not exceed 90%.
 - 3. Wall surfaces should be primed with a good quality wallcovering primer.

1.5 WARRANTY

- A. Submit manufacturer's written five year warranty against manufacturing defects.
 - 1. All wallcovering materials when adhered to a sound surface with the manufacturer's recommended procedures and adhesive, shall be warranted free of manufacturing defects for a period of 5 years from the date of Substantial Completion.
 - 2. Assuming no deterioration in the subsurface, if such manufacturing defects are claimed in writing during the warranty period, and proper documentation is presented to the manufacturer with regard to date of sale, plus adhesive used and surface applied to, the manufacturer, as its option, will either replace the vinyl wallcovering or refund the purchase price.

3. The foregoing limited warranty is in lieu of all other warranties, expressed or implied, written or oral.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Custom Digital Wallcovering Basis of Design as provided by MDC Wallcoverings or approved equivalent.
MDC Wallcoverings
Redsmith
Riot Creative Imaging
Thomas Printworks
1. Digital wallcovering shall be printed on 53"/54" vinyl wallcovering substrate using piezo drop-on-demand technology incorporating eight colors, CYMK and half density CYMK. Printed image shall be dried from both front and back using combinations of IR and platen heaters to prevent media distortion.
- B. Vinyl Wallcovering Substrate: Supported vinyl material, consisting of a through-pigmented, mildew-inhibitorized polyvinyl chloride, adhered to cotton, cotton/blend fabric backing, or a cellulose polyester nonwoven backing. All materials shall be Cadmium and Mercury free, and shall conform to the CFFA-W-101-B, using test methods as outlined in FedSpec CCC-T-191b, except as otherwise specified.
1. Total Weight: minimum 13 ounces per square yard, 19.5 ounces per linear yard.
2. Backing Weight: minimum 2 ounces per square yard.
3. Fabric backing and content: cotton, cotton/blend fabric, or a cellulose polyester non-woven.
4. Adhesion of coating to fabric: 3 pounds per 1 inch strip (ASTM D751).
5. Tensile strength: 97 X 92 (W x F).
6. Tear strength: 55 X 40 (W x F).
7. Flame Spread (UL): 10 (ASTM E84) or UL 723.
Smoke Developed (UL): 25 (ASTM E84) or UL 723.
Tested on reinforced cement board.
8. Mildew Resistance: Zone inhibition rating of "0" on face, "1" on backing (ASTM G21).
9. Staphylococcus Resistance: 100 percent reduction within 24 hours.
1006 NYS Quantitative Bacteria Resistance
10. Contains bactericides and mildew inhibitors to protect the product from microbiological and mildew growth, consistent with 40 C.F. R. §152.25.
- C. Adhesive: Heavy Duty Clay or Heavy Duty Clear or brands approved as equals by the manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Contractor shall examine surface for any imperfections. Do not start installation until unsatisfactory conditions are corrected.
- B. Install digital wallcovering in accordance with the manufacturer's written instructions using heavy-duty vinyl wallcovering adhesive recommended by the manufacturer (Wheat paste shall not be used).
- C. Before cutting, lay out panels in numeric order and examine each panel for color consistency, accuracy and proper image dimension.
- D. Install each panel in numerical sequence hanging first panel to a vertical line. Overlap subsequent panels to match crop lines and double cut on the wall. Selvage (excess trimmed edge) should be removed from the wall and the seam closed within one hour.
- E. Re-inspect after the application each panel for variations in color or pattern that are considered to be excessive. Notify wallcovering distributor or manufacturer's representative and request an inspection, before any further wallcovering is installed.
- F. The wallcovering shall be smoothed to the hanging surface, using a stiff bristled sweep brush or a flexible broad-knife to eliminate air bubbles.
- G. Remove excess adhesive along finished seams immediately after each wallcovering strip is applied. Use clean warm water, a natural sponge and clean towels. Change water often to maintain water cleanliness.

3.2 CLEAN-UP COMPLETION

- A. Upon completion of the work, remove surplus materials, rubbish and debris resulting from the wallcovering installation. Leave areas in neat, clean and orderly condition.

END OF SECTION

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SECTION 09 91 00

PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: On-the-job painting and finishing of exterior and interior surfaces.
 - 1. Included: Paint and finish the following materials, fittings, and equipment items which are exposed-to-view.
 - a. Iron, steel, and galvanized metal.
 - b. Wood.
 - c. Concrete masonry units.
 - d. Interior concrete ceiling and beam surfaces.
 - e. Gypsum board.
 - f. Interior caulked joints.
 - g. Portland cement plaster.
 - h. Bare and insulation covered piping and ductwork, conduit, hangers, grilles and registers, and primed metal surfaces and factory-finished surfaces of mechanical and electrical equipment.
 - 2. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels, including the following:
 - a. Factory-finished metal lockers and finished light fixtures.
 - b. Architectural aluminum and stainless steel.
 - c. Interior concrete floors and steps and all exterior concrete.
 - d. Acoustic panel ceilings, unless noted on drawings.
 - e. Pre-finished cabinets.
 - f. Operating parts: Moving parts of operating mechanical and electrical equipment, such as: valve and damper operators, linkages, sensing devices, motor and fan shafts
 - g. Labels: UL, FM, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.
 - 3. Contractor shall examine the drawings for mechanical and electrical work, and all materials installed throughout the building which require painting shall be painted under this section of the specifications.
- B. Related Sections:
 - 1. Section 05 12 00 - Structural Steel Framing: shop priming of structural steel.
 - 2. Section 05 21 00 - Steel Joists Framing: shop priming of steel joists.
 - 3. Section 05 50 00 - Metal Fabrications: shop priming of metal fabrications.

1.2 SYSTEM DESCRIPTION

- A. For purposes of this painting specification, the following areas and spaces are not considered finished, occupied areas and there will be no painting therein except for doors and frames and as may be specifically scheduled in article paint schedule.
 - 1. Mechanical chases.
 - 2. Spaces above suspended ceilings.
 - 3. Underfloor crawl spaces.
 - 4. Elevator hoistways.

1.3 SUBMITTALS

- A. Samples:
 - 1. Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
 - 2. Submit two 8-1/2" x 11" samples of each paint color scheduled on the color schedule prepared by the Architect. Samples shall be on heavy cardboard and shall be made with the actual mixed paints to be used on the project.
 - 3. Samples for Initial Selection of each type of texture finish product.
- B. Paint Schedule:
 - 1. If painting materials other than those specified are proposed for use, submit a complete schedule of the materials to be substituted.
 - 2. This schedule shall be in the same form as the paint schedule included in this section, and shall list materials by manufacturer, brand name, and type for each surface to be finished.

3. Provide data sheet for each paint type listed in schedule.
- C. Federal law requires renovation firms (including sole proprietorships) to be certified and requires individuals to be trained in the use of lead-safe work practices. Contractors who perform renovation, repairs, and painting jobs shall:
 1. Provide a copy of your EPA lead training certificate.
 2. Show what lead-safe methods you will use to perform the job.
 3. Provide references from at least three recent jobs involving projects before 1978.
 4. Keep records to demonstrate that you and your workers have been trained in lead-safe work practices and that you follow lead-safe work practices on the job.
- D. Close-out Schedule: Upon completion of work, furnish a full schedule of paint types, brand names, location of purchase, color numbers, and location each color is installed.

1.4 QUALITY ASSURANCE

- A. Product Manufacturer: Company specializing in manufacturing quality paint and finish products with 3 years' experience.
- B. Applicator: Company specializing in commercial painting and finishing with 2 years' experience.
- C. Product Labels: Include manufacturer's name, type of paint, stock number, color and label analysis on label of containers.
- D. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as final coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.
- E. V.O.C. (Volatile Organic Compound) Compliance: Products listed in the schedules and/or substitutes proposed for use by Contractor must be formulated to meet all applicable ordinances and regulations regarding maximum V.O.C. content. Utilize products which have been specially formulated to meet such requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials in original containers with seals unbroken and labels intact.
- B. Storage: Contractor shall designate a specific space at the project site for storing and mixing materials. Protect this space and repair all damage resulting from use. Do not store kerosene nor gasoline in this space. Remove oily rags at the end of each day's work.

1.6 PROJECT CONDITIONS

- A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 65°F. for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.
- B. Minimum application temperatures for latex paints: 45°F. for interiors; 50°F. for exterior; unless required otherwise by manufacturer's instructions.
- C. Minimum application temperature for varnish and finishes: 65°F. for interior or exterior, unless required otherwise by manufacturer's instructions.
- D. Provide lighting level of 80 ft.-candles measured mid-height at substrate surface.
- E. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85%; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instructions. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified during application and drying periods of 24 hours between coats and 72 hours after final coat.
- F. Protection: Provide sufficient drop cloths to fully protect adjacent finished work.

1.7 PRECAUTIONS

- A. Do not store paints, oils, thinners and other flammable items inside the building. They shall be stored in approved containers when not in actual use during the painting job. The fire hazard shall be kept at a minimum.
- B. Take precautions to protect the public and construction workers during the progress of the work.
- C. Furnish a temporary fire extinguisher of suitable chemicals and capacity, located near flammable materials.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Provide paint as manufactured by one of the following:
 - Benjamin Moore & Co. (<https://www.benjaminmoore.com>)
 - PPG Paints (<https://www.ppgpaints.com>)
 - The Sherwin-Williams Co. (<https://www.sherwin-williams.com>)
- B. Materials described are based on the specifications of the above listed manufacturers, and are given to designate the quality of materials required. Materials of best quality grade are representative of the standard of quality required. Materials not displaying manufacturer's identification as a first line, best-grade product will not be acceptable.
- C. Colors: The Architect will prepare a color schedule. Reference "Material Finish Schedule" in drawings. Regardless of which brand of paint is selected for use the Contractor shall intermix and blend as required to obtain an exact match to each color on the color schedule.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and substrate conditions are ready to receive work as instructed by the product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report to Architect any condition that may potentially affect proper application.
- C. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Gypsum wallboard: 12 percent.
 - 2. Interior located wood: 15 percent, measured in accordance with ASTM D 4442.
 - 3. Concrete: 12 percent.
 - 4. Masonry: 12 percent.
 - 5. Plaster: 12 percent
- D. Test shop-applied primers for compatibility with subsequent cover materials.
- E. Perform the following Test procedure prior to painting. This will determine if Passivators exist on galvanized metal. This procedure is not necessary on galvanized metal with G 90 Paint Grip.
 - 1. Prepare a solution by dissolving 20 grams of copper sulfate in one liter (1000 grams) of water. Copper sulfate crystals may be purchased at most drug stores.
 - 2. Solvent wash a small area per the procedure of SSPC-SP1.
 - 3. Sand a small washed area using emery cloth.
 - 4. Using a cotton swab saturated with the copper sulfate solution, apply a swipe to both sanded and unsanded washed areas.
 - 5. If the sanded and unsanded surfaces turn black at the same time and that time is less than 10 seconds, there is no passivation on the surface other than light oil, and a normal degreasing/cleaning operation is sufficient preparation prior to the coating application. If the unsanded surface turns slower than the sanded surface, or not at all, a passivator of some type is present on the surface. If neither surface turns, the surface is probably an alloy of zinc or some other metal.
 - 6. If the galvanized steel has been treated or passivated, the treatment or passivator must be removed by brush blasting. If this method is prohibited by environmental regulations, then chemical etching with

Amchem's GALVAPREP SG-3 will be acceptable, if previously approved by the Architect. The chemical etching manufacturer's procedures should be followed carefully.

7. If the surface is determined to be an alloy by this test procedure, notify Architect and adhesion tests of the proposed coating applied over the proposed surface preparation must be conducted.
8. If no passivators are present, wash galvanized metal surfaces with mineral spirits to remove residual grease and oil.

F. Beginning of installation means acceptance of existing surfaces and substrate.

3.2 PREPARATION

- A. Perform preparation and cleaning procedures in accordance with coating manufacturer's instructions for each substrate condition.
- B. Fill open joints, cracks and crevices on steel buck frames with metal putty and sand smooth before painting.
- C. Sand woodwork surfaces smooth before priming.
- D. Coat pine knots and pitch streaks with shellac before painting.
- E. Putty nail holes after the prime coat.
- F. Remove hardware and accessories, plates, lighting fixtures and similar items which are not to be finish-painted or provide adequate surface-applied protection for these items in place.
- G. Uncoated steel and iron surfaces: Remove grease, scale, dirt, and rust. Where heavy coatings of scale are evident, remove by wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.
- H. Shop primed steel surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.

3.3 APPLICATION

- A. Workmanship shall be of the highest quality. Mix and use paint materials in accord with the manufacturer's directions. Spread materials evenly, flow smoothly, and brush out without sags or runs.
- B. Provide finish coats which are compatible with primer paints used. Provide barrier coats over incompatible primers where required.
- C. When undercoats, stains or other conditions show through final paint coat, apply additional coats until paint film is of uniform color and sheen.
- D. Finish the insides of wood cabinets, including backs of cabinet doors, as scheduled for the fronts and ends.
- E. Between coats, sand enamel and lacquer finish on wood and metal surfaces to produce a smooth, even finish. Use #220 grit sandpaper or finer.
- F. Tint priming coats and undercoats to approximate shade of final coat to assure uniformity of color in the finish. Touch up suction spots and "hot spots" before applying the last coat to produce an even result in the finish coat.
- G. Exposed ductwork, piping and conduit in finished, occupied areas shall be painted the same color as the wall or ceiling against which it is installed, unless otherwise noted.
- H. Apply the finish coat on gypsum board, plaster, and concrete surfaces with rollers.
- I. On concrete masonry unit wall surfaces without a block filler, apply the first coat of paint with a spray gun.
- J. Apply paint to sound absorbing concrete masonry units with brushes and/or rollers; do not spray.
 1. Do not paint fibrous fillers of sound absorbing concrete masonry units.

2. Do not allow any paint, primer, or block filler to enter acoustic cells or impinge upon acoustic fillers in any way, including but not limited to, by overspray of spray-applied paint, or by drips, runs, sags, or splashes of paint, or through careless or negligent application of paint.
3. No paint shall be allowed on fibrous fillers of sound absorbing concrete masonry units; otherwise, sound absorbing concrete masonry units and fibrous fillers shall be replaced at no cost to Owner.

3.4 TOUCH UP AND CLEAN

- A. Touching Up: On completion, carefully touch up all holidays, marred and damaged spots, and work over all surfaces that have been repaired by other trades.
- B. Cleaning: Remove spilled, splashed, and splattered paint from all surfaces. Do not mar surface finish of item being cleaned.
- C. Reinstall the items removed under the provisions of paragraph above.

3.5 PAINT SCHEDULE

- A. The products listed below represent top of the line products of each manufacturer. These products are not presented as being equivalent, as there are too many variables to match each product across the board. Manufacturer's designations are:
PPG Pittsburgh Paints
SW The Sherwin-Williams Co.
- B. Interior Metal
 1. Steel door frames, borrowed light frames, louvers and vision panel frames in doors, hollow metal doors, sound retardant doors, and ladders.
1 primer coat
PPG Red Inhibitive Steel Primer, 6-208
SW Kromik Metal Primer E41N1
2 finish coats
PPG Speedhide 6-1110
SW ProMar 200 Alkyd Semi-Gloss Enamel, Series B34 W 200
 2. Steel pipe handrails and railings.
1 primer coat
PPG Red Inhibitive Steel Primer, 6-208
SW Kromik Metal Primer E41N1
2 finish coats
PPG Int/Ext Industrial Gloss Alkyd, 7-282 Series
SW Industrial Enamel, Series B54
 3. Grilles, diffusers and registers in walls and ceilings.
1 finish coat
PPG Speedhide Alkyd Lo-Sheen, 6-90
SW ProMar 200 Alkyd Eg-Shel Enamel, Series B33 W 200
 4. Other exposed iron and steel.
1 primer coat
PPG Speedhide Inhibitive Steel Primer, 6-208
SW Kem Kromik Metal Primer, B50 W 1
1 finish coat
PPG Speedhide Alkyd Lo-Sheen, 6-90
SW ProMar 200 Alkyd Eg-Shel Enamel, Series B33 W 200
 5. Metal pipe, conduit, ductwork, hangers, supports and brackets.
1 primer coat
PPG Speedhide White Galvanized Steel Primer, 6-209
SW Galvite Paint, B50 WZ30
1 finish coat
PPG Speedhide Alkyd Lo-Sheen, 6-90
SW ProMar 200 Alkyd Eg-Shel Enamel, Series B33 W 200
 6. Other exposed galvanized metal.
1 primer coat
PPG Speedhide White Galvanized Steel Primer, 6-209
SW Galvite Paint, B50 WZ30
2 finish coat
PPG Speedhide Alkyd Lo-Sheen, 6-90

- SW ProMar 200 Alkyd Eg-Shel Enamel, Series B33 W 200
- 7. Items of mechanical and electrical machinery and equipment.
 - 1 finish coat
 - PPG Int/Ext Industrial Gloss Alkyd, 7-282 Series
 - SW Industrial Enamel, Series B54
- C. Interior Concrete Masonry (At sound absorbing concrete masonry unit blocks, do not paint fibrous fillers)
 - 1. Concrete masonry unit walls scheduled to have Epoxy Paint.
 - 1 filler coat
 - PPG Pitt-Glaze Int/Ext Latex Block Filler 16-90
 - SW Heavy Duty Block Filler, B42 W 46
 - 2 finish coats
 - PPG Aquapon WB Waterborne Gloss Epoxy coating 98-1 Series
 - SW Water-Based Catalyzed Epoxy, Series B70, Gloss Hardener
 - 2. Concrete masonry unit walls in Mechanical Rooms.
 - 2 finish coats
 - PPG Speedhide Interior Acrylic Latex Semi-Gloss Enamel, 6-510 Series
 - SW Pro-Mar 200 Latex Semi-Gloss, B31 W 200
 - 3. Concrete masonry unit walls in Activity Room/Gymnasium
 - 1 filler coat
 - PPG Pitt-Glaze Int/Ext Latex Block Filler 16-90
 - SW Heavy Duty Block Filler, B42 W 46
 - 2 finish coats
 - PPG Speedhide Interior Acrylic Latex Semi-Gloss Enamel, 6-510 Series
 - SW Pro-Mar 200 Latex Semi-Gloss, B31 W 200
 - 4. Other concrete masonry unit walls.
 - 1 filler coat
 - PPG Pitt-Glaze Int/Ext Latex Block Filler 16-90
 - SW Heavy Duty Block Filler, B42 W 46
 - 2 finish coats
 - PPG Speedhide Interior Acrylic Latex Semi-Gloss Enamel, 6-510 Series
 - SW Pro-Mar 200 Latex Semi-Gloss, B31 W 200
- D. Gypsum Wallboard
 - 1. Gypsum board ceilings and furr downs.
 - 1 texture coat
 - USG Multi-Purpose Texture - Sprayed Splatter - Light Finish Texture
 - PPG Speedhide Acrylic Texture Coating 4-50
 - 3 finish coats
 - PPG Speedhide Interior Flat Latex 6-70 Series
 - SW ProMar 200 Latex Flat Wall Paint, Series B30 W 200
 - 2. Gypsum board walls scheduled to have Epoxy Paint.
 - 1 primer coat - fine sanded texture
 - SW ProMar 200 Latex Wall Primer, B28 W 200
 - 2 finish coats
 - PPG Aquapon WB Waterborne Gloss Epoxy Coating 98-1 Series
 - SW Water-Based Catalyzed Epoxy, Series B70, Gloss Hardener
 - 3. Gypsum board walls above ceramic tile wainscot in corridors.
 - 1 texture coat
 - USG Multi-Purpose Texture - sprayed splatter medium-light finish texture
 - PPG Speedhide Acrylic Texture Coating 4-50
 - 3 finish coats
 - PPG Speedhide Interior Enamel Eggshell Latex 6-411 Series
 - SW ProMar 200 Interior Latex Eg-Shel B20W2200 Series
 - 4. All other gypsum board walls.
 - 1 texture coat
 - USG Multi-Purpose Texture - sprayed splatter medium-light finish texture
 - PPG Speedhide Acrylic Texture Coating 4-50
 - 1 primer coat
 - SW PrepRite ProBlock Interior-Exterior Latex Primer-Sealer, B51-600 or approved equivalent
 - 2 finish coats
 - PPG Speedhide Interior Semi-Gloss Latex Enamel 6-510 Series
 - SW Pro-Mar 200 Latex Semi-Gloss, B31 W 200

E. Interior Caulked Joints

1. Caulking
 - 2 finish coats
PPG Speedhide Interior Semi-Gloss Latex Enamel 6-510 Series
SW Pro-Mar 200 Latex Semi-Gloss, B31 W 200

F. Dry fall Paint (where scheduled in drawings at Exposed Structure)

1. 2 finish coats
 - SW Waterborne Acrylic Dry Fall (B42W1)
Wet Mils: 3.5 - 5.0 per coat
Dry Mils: 1.5 - 2.0 per coat

G. Exterior Metal

1. Steel door frames and hollow metal doors.
 - 1 primer coat
PPG Speedhide Int/Ext Rust Inhibitive Steel Primer 6-208 Series
SW Kromik Metal Primer E41N1
 - 2 finish coats
PPG Int/Ext Industrial Gloss Alkyd Enamel 7-282 Series
SW Industrial Enamel, Series B54
2. Steel pipe, conduit, hangers supports and brackets.
 - 1 primer coat
PPG Speedhide Int/Ext Galvanized Steel Primer 6-209
SW Galvite Paint, B50 WZ30
 - 1 finish coat
PPG Int/Ext Industrial Gloss Alkyd Enamel 7-282 Series
SW Industrial Enamel, Series B54
3. Galvanized steel pipe handrails, railings, lintels, gates, metal fencing, ladders, ductwork, flashings, copings, roof hatches, tubular steel downspouts, galvanized gutters and downspouts, scuppers, ventilators, and louvers. (Reference test procedure for Passivators)
 - 1 primer coat
PPG Speedhide Int/Ext Galvanized Steel Primer 6-209
SW Galvite Paint, B50 WZ30
 - 2 finish coats
PPG Int/Ext Industrial Gloss Alkyd Enamel 7-282 Series
SW Industrial Enamel, Series B54
4. Items of mechanical and electrical machinery and equipment, including mechanical and electrical equipment on the roof which are 12" above roof line and are not concealed by a screen.
 - 1 finish coat
PPG Int/Ext Industrial Gloss Alkyd Enamel 7-282 Series
SW Industrial Enamel, Series B54
5. Cast iron downspout boots.
 - 1 primer coat
PPG Speedhide Int/Ext Rust Inhibitive Steel Primer 6-208 Series
SW Kem Kromik Metal Primer, B50 W 1
 - 1 finish coat
PPG Int/Ext Industrial Gloss Alkyd Enamel 7-282 Series
SW Industrial Enamel, Series B54

H. Exterior Concrete Masonry Units

- 1 filler coat
PPG Pitt-Glaze Int/Ext Latex Block Filler 16-90
SW Heavy Duty Block Filler, B42 W 46
- 2 finish coats
PPG Speedhide Exterior Flat Acrylic Latex 6-610 Series
SW A-100 Exterior Flat, A6-100 Series

END OF SECTION

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SECTION 10 11 16

MARKERBOARDS AND TACKBOARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Framed markerboards.
- B. Related Requirements:
 - 1. Section 06 10 00 - Rough Carpentry; wood grounds.

1.2 SYSTEM DESCRIPTION

- A. Performance Requirements:
 - 1. Reflectivity: Not to exceed specified range when tested at 60 degrees with a gloss meter in accordance with ASTM C 523.
 - 2. Contrast for marker boards (Light and Dark Effects): not more than 11.7 when tested with a BYK-Gardner Wave Scan 5+ Measurement Device showing visual acuity to the human eye at distances greater than 10 feet.

1.3 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES
- B. Product Data: Include complete manufacturer's catalog cuts and data sheets of anchors, fasteners, color chips (photographic reproductions are not acceptable) and installation requirements.
- C. Shop Drawings:
 - 1. Include types of units provided, location within each room, and length of each unit.
 - 2. Include dimensioned elevation drawings of each board assembly indicating joint locations and type of joint where required, and board mounting distances from floors.
 - 3. Include cross-section details showing each type of product and components; trim, face, core, backing materials and thickness, and key to elevations.
 - 4. Show anchorage details.
 - 5. Show installation details.
- D. Samples: Submit a 12" x 12" sample of each type of markerboard and tackboard. Submit a 6" long sample of each component of exposed trim.
- E. Quality Control Submittals:
 - 1. Test Reports: Copies of test reports, from certified testing agency, verifying that products have been tested and meet the specified performance requirements.

1.4 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA.
- B. Maintenance Data: Include data on regular cleaning, and stain removal.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame/smoke rating for vinyl fabric covered tackboards in accordance with ASTM E 84.
- B. BYK-Gardner Wavescan 5+
- C. Porcelain Enamel Institute (PEI): PEI-1002, Manual and Performance Specifications for Porcelain Enamel Writing Surfaces (Whiteboards).

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

1.7 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.

1.8 WARRANTY

- A. Assembled Units: Manufacturer's standard 1-year warranty against defects in materials and workmanship.
- B. Special Warranty for Porcelain-enamel Face Sheets: Manufacturer's standard Life-of-the-building warranty in which manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship. Failures include, but are not limited to: 1) Surface lose original writing and erasing qualities; 2) Surfaces become slick or shiny; 3) Surfaces exhibit crazing, cracking, or flaking.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. (MB) Liquid Chalk Type Board: Provide projectable porcelain enamel steel liquid chalk writing system, 4'-0" height by length indicated. Product/ manufacturer; one of the following:
 - LCS White Board; Claridge Products and Equipment, Inc.
 - Porcelain on Steel Markerboards; Platinum Visual Systems™; a division of abc School Equipment
 - 1. Face sheet of 24 gage leveled enameling steel with porcelain enamel writing surface.
 - 2. Core material of nominal 1/2" thick fiberboard or double-ply hardboard.
 - 3. Panel backing of 0.015" sheet aluminum or 26 gage sheet steel.
 - 4. Manufacturer shall factory assemble and bond together the face sheet, core and backing sheet.
 - 5. Colors shall be as selected by Architect.
 - 6. Markerboard panel shall be up to 16'-0" in length without joints.
- B. Frames and Trim: Provide not less than 1-1/2" wide, .062-inch thick, extruded aluminum frames and trim. Finish for exposed trim surfaces shall be Architectural Class II AA-M21A31 clear anodized coating (0.4 to 0.7 mil). Snap-on type trim is not acceptable. Product/manufacturer; one of the following:
 - Series 1; Claridge Products and Equipment, Inc.
 - HTS; Platinum Visual Systems™; a division of abc School Equipment
- C. Joint Strips: H-shaped aluminum in single pieces for full height of boards.
 - 1. At vertical joints within markerboards, color the strips to match the markerboards.
 - 2. At vertical joints between markerboards and tackboards, strips shall be anodized aluminum.
- D. Map Rails: 1" wide of extruded aluminum with cork insert and Claridge No. 51ES type end stops. Furnish one No. 51M metal map hook for each linear foot of map rail and two No. 51FH flag holders for each room with map rails. Finish map rail to match the markerboard frames."
- E. Chalktroughs: Heavy tubular type of extruded aluminum with cast aluminum end caps, finished to match the markerboard frames.
- F. Adhesive: Flash-proof type furnished or recommended by the manufacturer.

2.2 FABRICATION

- A. Fabricating Boards: Markerboards shall be factory framed units up to 16'-0" one piece in length. Boards too large to be factory framed shall be assembled on the job to match the factory-built boards.
 - 1. Assemble frames with hairline joints. Corner joints shall be mitered. There shall be no exposed face fasteners of any sort.
 - 2. Make up boards in single sheets without joints where possible. Where vertical joints are necessary, space them symmetrically and use joint strips to cover them. Horizontal joints are not acceptable.
 - 3. Vertical joints between markerboard and tackboard in the same frame shall be covered with single mullion trim pieces. Double mullions at these joints will not be acceptable.
 - 4. Provide a map rail across the top of each markerboard unit.

5. Provide a chalktrough under each markerboard unit.
6. Manufacturer's labels shall not be exposed to view.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions:
1. Verify surfaces to receive units are true and plumb. Report unsuitable conditions to the responsible contractor for correction prior to installation.
 2. Verify moisture and temperature levels of substrate and environment have stabilized.

3.2 INSTALLATION

- A. Erecting Framed Units: Install framed markerboards in conformance with the manufacturer's instructions using continuous wall hangers and adjustable mounting clip angles.
1. On masonry walls, secure the hangers with screws into metal expansion shields or with toggle bolts.
 2. On gypsum wallboard partitions, locate the hangers to engage the steel stud flanges where possible and secure with molly bolts or self-drilling fasteners into the studs, or attach to wood blocking with suitable length screws.
 3. On back of markerboards, field install blocking pads at 16" on centers horizontally and vertically. Apply manufacturer's recommended adhesive evenly over entire surface of each pad using a serrated trowel.
 4. The installed boards shall be flat, plumb, square and rigid.
 5. Mounting Height: From finished floor to bottom of chalkrail or bottom of tackboard shall be 36".

3.3 CLEANING

- A. Remove crates, cartons and rubbish from the premises and leave the rooms broom clean. Clean down board surfaces to leave them in perfect condition.

END OF SECTION

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SECTION 10 12 00

DISPLAY CASES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Display cases.
- B. Related Sections:
 - 1. Division 26 - Electrical; rough-in for light fixture.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data:
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for display cases.
 - 2. Include furnished specialties and accessories.
 - 3. Include installation instructions.
- C. Shop Drawings:
 - 1. Include plans, elevations, sections, and attachment details.
 - 2. Show location of seams and joints in tackboard panels.
 - 3. Include sections of typical trim members.
 - 4. Include diagrams for wiring of illuminated display cases.
- D. Samples: Submit a 12" square sample of tackboard material and a 12" length of trim.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Provide 390 Series display cases as manufactured by Claridge, Inc. Equivalent products of one of the following will be acceptable:
 - A-1 Visual Systems
 - Nelson-Harkins Industries
 - Poblocki Sign Company
 - 1. Provide in size(s) as shown on drawings.
 - 2. Field verify opening for display cases.
 - 3. Provide manufacturer's optional fully recessed LED light fixtures.

2.2 MATERIALS

- A. Aluminum Extrusions: Provide manufacturer's standard extruded aluminum sections of alloy and temper recommended by the aluminum producer or finisher for the type of use and finish indicated, and with not less than the strength and durability properties specified in ASTM B 221 for 6063-T5 alloy.
- B. Glass: Provide clear, tempered safety glass complying with the requirements of ASTM C 1048, Type I, Kind FT, Condition A, Class 1 - transparent.
- C. Tackboard: Provide seamless sheet, 1/4" thick ground natural cork compressed with a resinous binder with washable vinyl finish and integral color throughout, laminated to burlap backing. Provide color and texture as selected in "Material Finish Schedule" in drawings.
- D. Fasteners: Provide screws, bolts, and other exposed fastening devices of the same material as the items being fastened. Use theft-proof fasteners.

- E. Glazed Sliding Doors: 3/16" thick tempered glass, framed, with extruded aluminum frame; supported on ball-bearing rollers.
 - 1. Lock: Furnish each cover with the manufacturer's standard lock; key all locks alike. Furnish 2 keys per lock.

2.3 FABRICATION

- A. General: Fabricate display cases to comply with dimensions, design, and details, and quality indicated.
- B. Fabricate perimeter and cover frames with reinforced corners, mitered to a hairline fit, with no exposed fasteners.
- C. Hardware for Covers: Equip covers with the manufacturer's standard hardware of the type indicated.
- D. Provide the manufacturer's standard recessed display cases, fabricated to sizes indicated, consisting of the display case housing with perimeter frame, sides and back, tackable surface, and operable transparent covers with hardware.
- E. Perimeter Frame and Cover Design: Provide extruded aluminum perimeter frame of profile indicated. Provide extruded aluminum door frame of the profile indicated, glazed with 3/16" thick clear tempered glass.
- F. Finish: Class II, Clear Anodic Finish, AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating) complying with AAMA 611.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install units plumb, and level, in locations shown. Securely attach to the supporting structure with concealed fasteners, in accordance with the manufacturer's installation instructions.

3.2 CLEANING AND PROTECTION

- A. Upon completion of installation, clean surfaces in accordance with the manufacturer's instructions. Protect units from damage until acceptance by the Architect.

END OF SECTION

SECTION 10 14 00

IDENTIFYING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Cast aluminum letters
 - 2. Interior room identification signs.
 - 3. Exterior room identification signs.
 - 4. Building dedication plaque.
 - 5. Exterior Vinyl Adhesive Letters.
- B. Related Sections:
 - 1. Section 01 21 00 - Allowances.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Samples: Submit manufacturer's complete line of color samples, 1" x 3", for initial color selection.
- C. Invoices: Submit certified copies of invoices indicating description and quantity of signs delivered and installed.
- D. Template: Submit full-size template drawing for approval:
 - 1. Aluminum letter size, stock, spacing, anchorage devices, etc.
 - 2. Building Dedication Plaque.

1.3 PRE-INSTALLATION CONFERENCE

- A. Aluminum Letter Pre-installation Meeting: Contractor shall schedule a pre-installation meeting at the project site with the Architect, Contractor and building letter installer for approval of template field layout prior to beginning of installation.

1.4 QUALITY ASSURANCE

- A. Interior signs shall be provided by a single source with at least five years' experience successfully providing signs of similar type and scope.
- B. Signs shall comply with the Texas Accessibility Standards (TAS) and other laws and ordinances of authorities having jurisdiction. Braille shall be Grade II, having dimensions as required to meet TAS.

1.5 PACKING, DELIVERY, AND STORAGE

- A. Deliver components correctly packaged to prevent damage. Pack modules and back-up plates unassembled to allow for mechanical mounting of backplate to wall with concealed fasteners.
- B. Individually and clearly identify each sign number, type, location to be installed, mounting instructions, and other pertinent information.

1.6 WARRANTY

- A. Cast Aluminum Letters: Provide 5-year manufacturer's warranty.

PART 2 - PRODUCTS

2.1 CAST ALUMINUM LETTERS

- A. Basis of Design: A.R.K. Ramos Mfg Signage Systems.
- B. Type: Custom fabricated letters and numbers specified herein and shown on elevations in the drawings. Letters to be cast aluminum with clear anodized finish.
 - 1. Sign to read as referenced on drawings.
- C. Material: Manufacturer's standard aluminum alloy for casting. Screws shall be stainless steel.
- D. Fabrication:
 - 1. Letters shall be cast with smooth flat faces, sharp corners, true lines and accurate profiles.
 - 2. Cast letters shall be free of pits, scale, and holes, or other defects and faces shall be mechanically finished to a satin texture.
 - 3. Provide at least two points of attachment for each letter.
 - 4. Lighting: Provide lighting system equal to soft-glow lighting system by A.R.K. Ramos as scheduled.
- E. Pre-cleaning: Immerse the letters in hot alkaline cleaner to remove contamination.
- F. Clear Anodic Finish: Manufacturer's standard dark bronze anodic coating, 0.018 inch or thicker, over a satin (directionally textured) mechanical finish.

2.2 INTERIOR IDENTIFICATION GRAPHICS

- A. "InTouch" photopolymer plaque signs as manufactured by ASI Sign Systems, Inc. (8181 Jetstar Drive, Suite 100, Irving, Texas, 75063) or approved equivalent.
 - 1. Manufacture face panels utilizing an 1/8" integral photopolymer panel.
 - 2. Face panel tactile and Grade 2 Braille graphics shall be raised a minimum of 1/32".
 - 3. Treat the face panel to assure paint adhesion.
 - 4. Colors to be selected by Architect to meet ADA requirements for contrast.
 - 5. Characters and background of signs shall have eggshell, non-glare finish.
 - 6. Sign edges shall be painted to match background.
 - 7. Sign edges are to be smooth and free of saw marks and imperfections.
 - 8. Sign design shall be as indicated on drawings.
 - 9. Typeface font and size shall be per drawings.
 - 10. Lettering shall be computer generated, accurately reproducing the letterform.
 - 11. Provide matching coverplate for signs mounted on glass.

2.3 EXTERIOR ROOM IDENTIFICATION GRAPHICS

- A. Wall-mounted plaque signs as manufactured by ASI-Modulex or approved equivalent. (Phone 972.915.3800)
 - 1. Manufacture panels utilizing an aluminum panel.
 - 2. Face panel tactile and Grade 2 Braille graphics shall be raised a minimum of 1/32".
 - 3. Colors to be selected by Architect to meet ADA requirements for contrast.
 - 4. Sign edges are to be smooth and free of imperfections.
 - 5. Sign design shall be as indicated on drawings.
 - 6. Typeface font and size shall be per drawings.
 - 7. Lettering shall be computer generated, accurately reproducing the letterform.

2.4 BUILDING DEDICATION PLAQUE

- A. Provide building dedication plaque as manufactured by A.R.K. Ramos Manufacturing Co., Inc. or approved equivalent.
 - 1. Material: 3/8" deep aluminum with paint-filled letters.
 - 2. Size: Refer to drawings.
 - 3. Typeface: Refer to drawings.
 - 4. Text: 500 letters in 18 - 20 lines, as provided by Architect.
 - 5. Paint fill color: Selected by the Architect from the manufacturer's standard colors.
 - 6. Sandblasted matte texture of face and edges.
 - 7. Mounting: Provide 17-1/2" x 23-1/2" x 1/4" thick Lexan plastic mounting plate.
 - 8. Secure mounting plate to wall using toggle bolts.

9. Attach plaque to a mounting plate using four matching dowels and construction adhesive.

B. EXTERIOR VINYL ADHESIVE LETTERS

C. Vinyl Adhesive Letters:

1. Provide 2-mil thick, moisture resistant, electronic cut and thermal transfer Scotchcal™ ElectroCut™ Graphic Film Series 7725 or approved equivalent.
2. Provide letters/numbers at each building entry in number/letter configuration as on drawings.
3. Provide letters/numbers in location near entry as shown on drawings.
4. Provide 7-year warranty.
5. Color as selected by Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Erecting Letters: Erect letters straight and level on the exterior face of building where shown.
 1. Attached to face brick: Secure with threaded stud anchors set in non-staining, quick setting cement. Letters shall be flush mounted to masonry surfaces.
 2. Attached to CMU wall: Secure letters to CMU wall with stainless steel threaded rods and non-staining, quick setting cement. Letters shall be flush mounted to masonry surfaces.
 3. Bottom rail mounting on top of prefabricated aluminum canopy.
 - a. Attach continuous aluminum rail to top of aluminum canopy as indicated on the Drawings.
 - b. Drill and tap letters from the bottom, with stainless steel screws going through aluminum rails.
 - c. Provide a flattened base on letters with round bottoms (O, S, G, etc.) to receive studs.
 - d. Include tiebacks as recommended by letter fabricator.
- B. Identification Graphics:
 1. On hard surfaces (i.e. ceramic tile, masonry, or plastic laminate), install room identification signs plumb and square with the "Tuff-bond" silicone adhesive furnished by the manufacturer (foam tape is not allowed).
 2. On painted gypsum wallboard or vinyl wallcovering, install room identification signs on backing plates with the "Tuff-bond" silicone adhesive furnished by the manufacturer (foam tape is not allowed).
 - a. The backing plate shall be 1/8" thick and shall be the same size as the face panel.
 - b. Screw the backing panel into molly bolts in the wall with two countersunk, flathead screws.
 3. Tactile characters on signs shall be located 48 inches minimum above the finish floor or ground surface, measured from the baseline of the lowest tactile character and 60 inches maximum above the finish floor or ground surface, measured from the baseline of the highest tactile character.
 4. Unless noted otherwise, install signs on latch side of the door such that clear floor space of 18 inches minimum by 18 inches minimum, centered on the tactile characters, is provided beyond the arc of any door swing between the closed position and 45 degree open position.
 5. Installation shall comply with ADA requirements.
 6. For signs mounted on glass, install matching coverplate on opposite side of glass and aligned with the sign.
- C. Building Dedication Plaque: Install building dedication plaque plumb and square in strict compliance with manufacturer's instructions.
- D. Vinyl Adhesive Letters: Install pressure sensitive vinyl letters plumb and square in strict compliance with manufacturer's instructions.

3.2 CLEANING

- A. On completion, clean exposed surfaces and leave free of defects.
- B. Do not use abrasives.

3.3 COORDINATION

- A. Contractor shall coordinate the installation of the identifying devices with other trades involved in the project.

3.4 DAMAGE

- A. An identifying device which is scratched or defaced will be rejected.

END OF SECTION

SECTION 10 21 13.17

SOLID PHENOLIC TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Solid phenolic toilet compartments.
- B. Related Sections:
 - 1. Section 06 10 00 - Rough Carpentry: wood blocking for bracket attachments.
 - 2. Section 10 28 00 - Toilet Accessories.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 – SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data:
 - 1. Include complete manufacturer's catalog cuts and data sheets of hardware, anchors, fasteners, and installation requirements.
 - 2. Submit literature documenting that the partition door latch meets Texas Accessibility Standards (TAS) requirements.
- C. Shop Drawings: Include drawings for fabrication and erection of toilet compartment assemblies which are not fully described in manufacturer's data.
- D. Samples:
 - 1. Submit a sample, 6" by 6", of each finish and color selected (photographic reproductions of color are not acceptable).
 - 2. Submit a sample of each item of hardware and material component.

1.3 SEQUENCING AND SCHEDULING

- A. Coordinate work with placement of suspension members and anchorage devices. Supply rough-in data in sufficient time for concealed preparatory to be conducted.

1.4 WARRANTY

- A. Submit manufacturer's standard 25-year warranty against breakage, delamination, and corrosion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E84, Class B; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 75 or less.
 - 2. Smoke-Developed Index: 450 or less.

2.2 ACCEPTABLE MANUFACTURERS

- A. Provide floor-mounted, overhead-braced toilet compartments. Product/manufacturer; one of the following:
 - Concord; Accurate Partitions Division, Kinkead Industries, Inc.
 - Embassy; Global Steel Products Corp.
 - Corinthian; Metpar Corp.
 - Academy; The Sanymetal Products Co., Inc.

2.3 MATERIALS

- A. Solid phenolic core with melamine facing on both sides, fused to substrate without visible glue line or seam. Provide units with eased edges and with minimum 3/4-inch thick doors and pilasters and minimum 1/2-inch thick panels and screens. Color(s) as selected by Architect from manufacturer's full range of colors.
- B. Pilaster Shoes: ASTM A 167, Type 302/304 stainless steel of one-piece construction, 3" high, finish to match hardware.
- C. Headrails: Extruded, polished anodized aluminum in anti-grip profile.

2.4 FABRICATION

- A. Fabricate flush compartment panels, pilasters, and doors to the layout indicated with the following minimum dimensions.
 - 1. Where grab bars are indicated, provide a min. 32" wide (clear opening) door.
 - 2. At other locations, standard compartments shall have a 24" wide in-swinging door, unless specifically detailed and dimensioned otherwise.
 - 3. Doors and compartments panels 58" in length with a 12" clearance between floor and bottom of panels and doors. Pilasters shall be floor mounted, overhead braced, 82" high.
 - 4. Urinal screens 18" by 42" high.
- B. Hardware: Provide hardware and fittings for compartment system of chrome-plated cast non-ferrous metal alloy, chrome-plated brass, or polished stainless steel. Stirrup brackets only may be heat-treated extruded aluminum with bright anodized finish.
 - 1. Hinges: Full length extruded aluminum in bright dip anodized finish or 14 gauge stainless steel continuous piano hinge. Hinges shall be fastened with stainless steel screws.
 - 2. Latches: Heavy-duty extruded aluminum (6463-T5 alloy) and provision for emergency access and paddle handle on accessible stalls in compliance with the ADA. Latch housing shall have bright dip anodized finish.
 - 3. Strikes and Keepers: Wrap-around type with rubber bumper, mounted with through bolts.
 - 4. Coat hooks with rubber bumpers for in-swinging doors.
 - 5. Pulls: Provide pulls adjacent to the latch on both sides of the toilet partition door. Furnish with wall bumpers where required to prevent doors from striking wall.
 - 6. Brackets: Heavy duty aluminum (6463-T5 alloy) full length continuous wall brackets. The use of U-type brackets is not acceptable.
 - 7. Fasteners: Vandal proof (one-way) screws and sex bolts of chrome-plated brass or stainless steel for all exposed locations.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Check areas scheduled to receive partitions for correct dimensions, plumbness of walls, soundness of wall surfaces, location of built-in framing/anchorages/bracing, and other conditions that would affect proper installation of holding brackets and anchorage or suspension devices.
- B. Verify spacing of plumbing fixtures to assure compatibility with installation of partitions.

3.2 INSTALLATION

- A. Install compartments rigid, straight, plumb, and with horizontal lines level. Drilling, cutting, and fitting to room finish shall be concealed in the finished work. Clearance at vertical edges of doors shall be uniform from top to bottom, and doors shall be free of warp and wind. Provide clearances of not more than 1/2" between pilasters and panels, and not more than 1" between panels and walls.
 - 1. Attach dividing compartments to the back wall with continuous wall brackets and at the front to the pilasters with the same type brackets. The use of U-type brackets is not acceptable.
 - 2. Attach overhead braces to walls with heavy saddle-type brackets.
 - 3. Attach pilasters to floor with 3/8" threaded studs, washers, lock nuts, expansion shields (minimum of 2" penetration into concrete), and pilaster brackets. Level, plumb, and tighten the installation with the leveling device. Conceal the floor anchorage and bases with pilaster shoe assembly having concealed snap-down action on a concealed hold-down clip. Exposed fasteners on shoe will not be permitted.

3.3 ADJUST AND CLEAN

- A. Adjusting: Adjust hardware just prior to final acceptance. Doors shall operate freely.
 - 1. For out-swinging doors, adjust hinges to hold doors closed.
 - 2. For in-swinging doors, adjust hinges to hold doors open at 30°.
- B. Cleaning: Remove protective masking and clean surfaces, leaving them free of soil and imperfections.

END OF SECTION

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SECTION 10 22 39

FOLDING PANEL PARTITIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Manually operated, folding panel partition.
- B. Related Work:
 - 1. Section 05 50 00 - Metal Fabrications: Steel framing to support partition track.
 - 2. Section 06 10 00 - Rough Carpentry: Wood blocking for partition track.
 - 3. Section 09 72 16 - Vinyl-coated Fabric Wall Covering.

1.2 SUBMITTALS

- A. Shop Drawings:
 - 1. Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
 - 2. Submit shop drawings of partition layout. Include details of track, trolleys, and hardware. Indicate loading to be imposed in the supporting structure. Show all anchorage, accessory items, caulking, and finishes.
- B. Product Data:
 - 1. Submit data describing partition fabrication and installation, including hardware.
 - 2. Submit finish data.
 - 3. Submit laboratory acoustical performance test report, written by the test facility.

1.3 QUALITY ASSURANCE

- A. Flame Spread Rating: Provide partitions with a Class "A" flame-spread rating when tested in accordance with ASTM E 84.
- B. Provide demonstration of system as described in Part 3 below.

1.4 WARRANTY

- A. Provide written warranty by manufacturer of operable partitions agreeing to repair or replace any components with manufacturing defects.
 - 1. Warranty period: Two (2) years.

PART 2 - PRODUCTS

2.1 PARTITIONS

- A. Basis of Design Type: Modernfold "Acoustic-Seal" Paired Panel #932 manually operated, flat panels hinged in pairs, top supported with operable floor seals.
 - 1. Products from the following Manufacturers equal to Basis of Design will be considered:
 - Kwik-Wall Company
 - Modernfold, Inc. (Dorma Kaba Group)
- B. Sound Transmission Class (STC): STC rating shall be 45 (50 in rooms with acoustical insulation in walls) when tested in accordance with ASTM E 90 for test in 14'-0" x 9'-0" opening.
- C. Panel Construction:
 - 1. Panels shall be 3.25" thick.
 - 2. Panel Skin: Minimum 21 ga. roll-formed steel wrapping around the panel edge. Panel skins shall be lockformed and welded directly to the frame for unitized construction.
 - 3. Panel Finish:
 - a. Half Height Markerboard: White enamel on steel, bonded to the face of the panel with horizontal trim without exposed fasteners. Half height marker wall and vinyl wall covering as selected by

Architect from wall coverings as specified in SECTION 09 72 16 - VINYL-COATED FABRIC WALL COVERING.

- D. Sound Seals:
 - 1. Vertical: Interlocking sound seals in each panel edge.
 - 2. Horizontal:
 - a. Top closure seals shall be continuous multi-finger vinyl.
 - b. Provide automatic operable bottom seal. Seal shall automatically drop as panels are positioned.
- E. Pocket Doors: Acousti-Seal Pocket Doors by Modernfold, Inc., with same construction, finish, and appearance as the adjacent panels.
 - 1. Pocket Door configuration shall be manually operated and bi-fold hinged to a jamb on one side as required.
 - 2. Panels shall be nominal 3-inch thick in manufacturer's standard width. All panel horizontal and vertical framing members fabricated from minimum 18-gage formed steel with overlapped and welded corners for rigidity. Frame is designed so that full vertical edges of panels are of formed steel and provide concealed protection of the edges of panel skin.
 - 3. Panel skin and face shall be same as the adjacent panels.
 - 4. Panel hinges shall be full leaf butt hinges, attached directly to panel frame with welded hinge anchor plates within panel to further support hinge mounting to frame. Hinges mounted into panel edge or vertical astragal are not acceptable.
 - 5. Pocket Door hanging weight shall not exceed 9 lbs./square foot.
- F. Provide #17 suspension system consisting of a continuous roll formed 11 ga. steel track. Each panel shall be supported by a all-steel 4-wheel ball bearing trolley.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Partitions shall be installed by the manufacturer's authorized factory trained representative and shall achieve the specified sound rating.
 - 1. Secure ceiling tracks to steel framing.
 - 2. Erect the partitions in a substantial manner to be straight and plumb.

3.2 ADJUST AND CLEAN

- A. Adjust partitions and hardware, and leave in perfect working order. Clean exposed surfaces and leave free of defects.

3.3 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance and user personnel to adjust, operate, and maintain operable panel partitions.

END OF SECTION

SECTION 10 28 00

TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Toilet accessories.
- B. Related Sections:
 - 1. Section 08 80 00 - Glazing: un-framed mirrors.
 - 2. Section 10 21 13.17 - Solid Phenolic Toilet Compartments.

1.2 SUBMITTALS

- A. Product Data:
 - 1. Submit in accordance with SECTION 01 33 23 – SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
 - 2. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 3. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.

1.3 QUALITY ASSURANCE

- A. Products: Provide products of the same manufacturer for each type of accessory unit and for units exposed in the same area.
 - 1. Stamped names or labels on exposed faces of units will not be permitted.
 - 2. Provide locks where specified, with the same keying for all accessory units in the project.

1.4 COORDINATION

- A. Accessibility Standards: Coordinate accessory locations with other work to prevent interference with clearances required for access under Texas Accessibility Standards (TAS), Architectural Barriers Act--Article 9102, Vernon's Texas Civil Statutes and Texas Government Code, Chapter 469.

1.5 WARRANTY

- A. Provide manufacturer's written 10-year limited warranty for hand dryers.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Toilet accessories shall be of the quality manufactured by Bobrick Washroom Equipment, Inc. and are listed by Bobrick catalog numbers for convenience in identification. Warm-air hand dryers shall be of the quality manufactured by World Dryer. The use of a catalog number as a description of an item shall be taken to include the description or specification for the item in the manufacturer's catalog.
- B. Toilet Accessories: Equivalent items of the following manufacturers are acceptable:
 - American Specialties, Inc.
 - Bradley Corp.
 - General Accessory Manufacturing Co. (GAMCO)
 - McKinney/Parker Washroom Accessories Corp.

2.2 BASIC MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304 with No. 4 satin finish.
- B. Brass: ASTM B 19, leaded and unleaded flat products; ASTM B 16, rods, shapes, forgings, and flat products with finished edges; ASTM B 30 castings.

TOILET ACCESSORIES

- C. Sheet Steel: ASTM A 1008, cold rolled, commercial quality.
- D. Galvanized Steel Sheet: ASTM A 653, G60 (Z180).
- E. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service), nickel plus chromium electro-deposited on base metal.
- F. Mirror Glass: ASTM C 1036, Type I, Class 1, Quality q3, nominal 1/4" thick, with silvering, electroplated copper coating, and protective organic coating complying with ASTM C 1036.
- G. Galvanized Steel Mounting Devices: ASTM A 153, hot-dip galvanized after fabrication.
- H. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.
- I. Keys: Provide universal keys for access to accessories for servicing and resupplying. Provide minimum of six keys.

2.3 ACCESSORIES

- A. Toilet Tissue Dispensers (A1): Owner Furnished; Contractor Installed.
- B. Grab Bars (B1, B2): Model B-6806, lengths as shown on drawings.
- C. Mirrors (D1): Model B-290 2436 or sizes as indicated.
- D. Paper Towel Dispenser, Recessed (E3): Owner Furnished; Contractor Installed.
- E. Sanitary Napkin Disposal Units (F1): Model B-270.
- F. Soap Dispensers, Wall-Mounted (G1): Owner Furnished; Contractor Installed.
- G. Mop & Broom Holder/Custodian's Utility Shelves (J1): Model B-224 x 36", one per Custodian's Closet and where scheduled.
- H. Mop and Broom Holders (J2): Model B-223 x 36.
- I. Coat/Robe Hooks (K1): Model B-211.
- J. Baby Changing Station (P1): Model KB110-SSRE baby changing station by Koala Kare Products.
- K. Waste Receptacle, Recessed (S2): Model B-3644.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions and recommendations, using fasteners appropriate to substrate and recommended by manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated. Adhesive mountings and plastic rawl plug mounts will not be acceptable.
- B. Secure mirrors to walls in concealed, tamper-resistant manner with special hangers, toggle bolts, or screws. Set units level, plumb, and square.
- C. At toilets with wheelchair compartments all toilet accessories shall be installed so that operating areas such as pushbuttons, openings for towels, cups and waste are not more than 48" above finished floor for frontal approach.
- D. Attach dispensers and cabinets to steel stud partitions with suitable hollow wall screw anchors. Attach dispensers and cabinets to masonry partitions with stainless steel expansion shields and machine screws.

- E. Attach sanitary napkin disposal units and toilet tissue dispensers to toilet partition panels with stainless steel or chrome plated through bolts and hex cap nuts.
- F. Install grab bars to withstand a downward load of at least 250 lbf. Attach grab bars to toilet partition panels with stainless steel through bolts and plated hex cap nuts. Attach grab bars to steel stud partitions with connector assemblies to steel anchors fastened to studs. Attach grab bars to masonry partitions with stainless steel expansion shields and machine screws.

3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly. 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 44 13

FIRE EXTINGUISHERS AND CABINETS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Fire extinguishers and fire extinguisher cabinets.

1.2 DEFINITIONS

- A. Where indicated on the drawings the abbreviation "F.E.C." defines a fire extinguisher and cabinet and the abbreviation "F.E." is for fire extinguisher without cabinet.

1.3 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data: Include physical dimensions, operational features, color and finish, anchorage details, material descriptions and type of hardware.
- C. Shop Drawings: Include rough-in measurements, locations, and details for cabinets.

1.4 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA.
- B. Maintenance Data: Include test, refill or recharge schedules and re-certification requirements.

1.5 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain products in this Section from one manufacturer.
- B. Certifications
 - 1. Provide extinguishers which are U.L. listed and bear the U.L. "Listing Work" for type, rating, and classification.
 - 2. Conform to NFPA-10 requirements for extinguishers.
 - 3. Provide units conforming with ANSI/UL 711.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle products in accordance with SECTION 01 65 00 - PRODUCT DELIVERY REQUIREMENTS and SECTION 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS.
- B. Store extinguishers in protected location until after final cleaning is completed.

1.7 PROJECT/SITE CONDITIONS

- A. Environmental Requirements: Do not store products subject to freeze damage in environments where damage could occur.

PART 2 - PRODUCTS

2.1 FIRE EXTINGUISHERS

- A. Provide multi-purpose dry chemical type fire extinguisher, 10 lbs. nominal capacity. Provide manufacturer's standard hook type bracket where fire extinguishers are noted without cabinets. Product/manufacturer; one of the following:
 - Cosmic 10E; J.L. Industries, Div. of Activar, Inc.

MP10; Larsen's Manufacturing Co.
Wing 10HB; Modern Metal Products
Model 3010; Potter-Roemer

2.2 FIRE EXTINGUISHER CABINETS

- A. Provide stainless steel trim and door. Doors shall be solid with vertical window and have continuous piano hinge. "Fire Extinguisher" vertical ascending silk-screened lettering in red. Product / manufacturer; one of the following:
 - Fire-FX 1037V10 Cosmopolitan; J.L. Industries, Div. of Activar, Inc.
 - FS SS2409-R4 Vertical Duo, Acrylic; Larsen's Manufacturing Co.
 - "Alta" Series No. 7063-DV-6; Potter-Roemer.
- A. At Kitchen provide wet chemical type fire extinguisher with a Class K UL rating. Provide manufacturer's standard wall mounting bracket. Product/manufacturer; one of the following:
 - Saturn 15 Model, JL Industries, Inc., Div. of Activar, Inc.
 - WC-6L Series Wet Chemical, Larsen's Manufacturing Co.
 - 3260; Potter-Roemer/B260; Amerex

2.3 MOUNTING BRACKETS

- A. Mounting Brackets: Manufacturer's standard steel, designed to secure fire extinguisher to wall or structure, of sizes required for type and capacity of fire extinguisher indicated, with plated or baked-enamel finish. Color shall be red.
- B. Identification: Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface. Orientation shall be horizontal.

2.4 FABRICATION

- A. Form body of cabinet with tight inside corners and seams.
- B. Predrill holes for anchorage.
- C. Form perimeter trim and door stiles by welding, filling, and grinding smooth.
- D. Hinge doors for 180° opening with continuous piano hinge. Provide nylon roller type catch.

2.5 FINISHES

- A. Extinguisher: Red enamel.
- B. Cabinet Trim and Door: Stainless Steel
- C. Cabinet Interior: White enamel.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install fire extinguisher cabinets at locations indicated in accordance with the manufacturer's instructions. Install level, plumb, secure. Install fire extinguisher cabinets with operable part of extinguisher at 48" above finished floor.
- B. Install fire extinguishers within cabinets on mounting brackets, placed in such a manner that operating instructions face outward.
- C. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb. Apply identification decals above bracket-mounted fire extinguishers.
- D. Service, charge (if required), and tag each fire extinguisher not more than five calendar days prior to substantial completion.

E. Maintain design of fire-rated partitions associated with cabinets.

END OF SECTION

SECTION 10 51 13

METAL LOCKERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Metal lockers.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-in-Place Concrete; concrete in base.
 - 2. Section 06 10 00 - Rough Carpentry; wood sleepers and wood blocking.
 - 3. Section 09 65 13 - Resilient Base.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data: Submit complete manufacturer's catalog cuts and data sheets of hardware, anchors, fasteners and installation requirements.
- C. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Show base, sloping tops and other accessories. Include locker identification system.
- D. Samples: Submit color chips (photographic reproductions of color are not acceptable).

1.3 QUALITY ASSURANCE

- A. Uniformity: Provide each type of metal locker as produced by a single manufacturer, including necessary mounting accessories, fittings, and fastenings.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for metal locker installation.
- B. Store and protect lockers under provisions of SECTION 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS.
- C. Protect locker finishes and adjacent surfaces from damage during installation.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. General Lockers: Materials and methods described are based on the specifications of Penco Products, Inc. (www.pencoproducts.com) and are given to designate the quality of materials and workmanship required. Equivalent lockers as manufactured by one of the following will be acceptable:
 - Art Metal Products, Div Fort Knox Storage Co. (www.artmetalproducts.com)
 - List Industries, Inc. (www.listindustries.com)
 - Lyon Metal Products, Inc. (www.lyonmetal.com)

2.2 STANDARD LOCKERS

- A. Materials: Sheet metal shall be smooth cold-rolled steel, ASTM A 1008, at least 16 gage for doors and frames and 24 gage for bodies. Nuts and bolts shall be cadmium plated.
- B. Construction: Doors shall be louvered at top and bottom, and adequately flanged at edges. Door frames of channel shapes shall be securely welded together. Provide continuous door strikes at jambs. Provide rubber silencers on each latching hook. Fabricate to swing 180°.

METAL LOCKERS

1. Ventilation: Provide stamped, louvered vents in door face, as follows:
 - a. Double-tier Lockers: Not less than 6 louver openings top and bottom.
 2. Hinges: Heavy-duty, not less than 0.050" thick steel, full-loop, 5 knuckle, tight pin, 2" high. Provide at least 3 hinges for each door over 42" high and at least 2 hinges for each door 42" high or less.
- C. Locks:
1. Recessed handle with:
 - a. Provisions for Owner-furnished padlocks.
 2. Provide handicapped accessible latches on accessible lockers.
- D. Trim: 16 gage steel filler strips to cover spaces between lockers and adjacent walls at ends of rows and elsewhere as may be required. Provide finished end panels (no holes) for exposed ends of locker rows. Finish trim to match lockers.
- E. Equipment: Furnish each locker with the following items.
1. Double-tier Lockers:
 - a. One double prong hook and not less than two single-prong wall hooks.
 - b. At handicapped accessible lockers, hat shelf, hooks and handle with locker or hasp must be no higher than 48" from finish floor
 - c. At handicapped accessible lockers, locker bottom must be a minimum of 15" from finish floor. If locker bottom is lower than 15" from finish floor, provide internal shelf at a minimum of 15" above finish floor.
- F. Continuous Sloping Tops: Not less than 18-gage sheet steel, approximately 25° pitch, in lengths as long as possible. Provide closures at ends. Finish to match exterior of lockers.
- G. Finish:
1. Chemically pre-treat metal with degreasing and phosphatizing process.
 2. Enamel powder coat paint finish electrostatically applied, baked, and properly cured to manufacturer's specifications for optimum performance.
 3. Finishes containing volatile organic compounds and subject to out-gassing are not acceptable.
 4. Color: Lockers shall be one custom color exterior and shall be manufacturer's standard color interior. Colors as scheduled in "Material Finish Key" on drawings.
- H. Number Plates: Aluminum with black filled numbers, fastened with rivets to the top of the front face of the locker door, not in the recess. Number lockers consecutively as directed by Owner.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls, floors, and support bases and verify that bases are properly sized and located. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install level, plumb, and true; shim as required, using concealed shims.
- B. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36" o.c. The use of sheet metal screws for assembly and installation is not allowed.
- C. Accessories: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.

3.3 ADJUST AND CLEAN

- A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding.
- B. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint.

- C. Touch-up marred finishes, or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by metal locker manufacturer.

END OF SECTION

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SECTION 10 56 13

METAL STORAGE SHELVING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Metal storage shelving.

1.2 SUBMITTALS

- A. General: Submit following items in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data: Include complete manufacturer's catalog cuts and data sheets, complete parts list, installation requirements, and all pertinent performance characteristics and criteria.
- C. Shop Drawings: Indicate materials, construction, sizes, quantities, finishes, and installation details.

1.3 QUALITY ASSURANCE

- A. Source Limitations: Provide metal storage shelving of the same manufacturer throughout the project.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, handle, and protect products in accordance with SECTION 01 65 00 - PRODUCT DELIVERY REQUIREMENTS and SECTION 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Provide metal storage shelving as manufactured by one of the following:
 - Lyon Workspace Products
 - Penco Products, Inc.
 - Republic Storage Systems Co.
 - Richards-Wilcox
 - Tennsco
 - Western Pacific Storage Systems

2.2 MATERIALS

- A. Basis of Design: Provide RiveTier Long Span Shelving as manufactured by Western Pacific Storage Systems (1-800-270-0427).
 - 1. Sizes: Refer to drawings.
 - 2. Metal Shelves: 22 gauge steel.
 - 3. Standard Duty Angle Upright Post - LURH - 14 gauge steel.

2.3 FABRICATION

- A. Fabricate metal storage shelving square and rigid with posts plumb and true, and shelves flat and free of dents or distortion. Fabricate exposed metal edges free of sharp edges and burrs. Fabricate connections to form a rigid structure, free of buckling and warping.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install metal storage shelving in strict accordance with manufacturer's written instructions and recommendations.

METAL STORAGE SHELVING

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- B. Install metal storage shelving level, plumb, square, and true.
- C. Install bracing as recommended by manufacturer and as required for stability.

3.2 PROTECTION

- A. Protect the completed work from damage. Replace damaged items which cannot be repaired. Protect finished installation in accordance with SECTION 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS.

3.3 CLEANING

- A. Upon completion of the building, clean the metal storage shelving. Leave the metal storage shelving free of defects and in ready-to-use condition.
- B. Perform final cleaning in accordance with SECTION 01 74 13 - PROGRESS CLEANING.

END OF SECTION

SECTION 10 73 26

PREFABRICATED WALKWAY COVERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Prefabricated walkway canopies and wall-mounted suspended canopies.
- B. Related Requirements:
 - 1. Section 03 30 00 - Cast-in-place Concrete.
 - 2. Section 07 92 00 - Joint Sealants.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Shop Drawings: Include drawings showing small scale layouts of prefabricated walkway canopies and large-scale details of edge conditions, joints, expansion joints, anchorages, trim, closures, and special details.
- C. Samples: Submit two 12" square samples of finished metal panels.
- D. Certification: Submit design calculations sealed and signed by an engineer registered in the State of Texas. Design calculations shall state that the protective cover system design complies with the wind requirements of all governing jurisdictions, the stability criteria of applicable building code, and all other governing criteria.
 - 1. At all freestanding, column-supported walkway covers and canopies, the footings shall be designed by the manufacturer and constructed by General Contractor, unless detailed otherwise. Concrete footings are required to be provided for all column-supported walkway covers and canopies whether indicated on the drawings or not. Submittals shall include sealed calcs and shop drawings for footings.
 - 2. At all building-connected, column-supported walkway covers and canopies, the footings shall be designed by the Architect's structural engineer and constructed by General Contractor, unless detailed otherwise.

1.3 QUALITY ASSURANCE

- A. Wind Loading: Fabricate and install prefabricated walkway canopies and other components of system to comply with code requirements for resisting wind effects based on a 120 mph wind.
- B. Installer Qualifications: Engage an experienced installer who is an authorized representative of the canopy manufacturer and has completed installation of canopies similar in material, design, and extent to canopy required for this project.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Provide prefabricated walkway canopies as manufactured by one of the following:
 - AVAddek
 - Dittmer Architectural Aluminum
 - Mapes Industries, Inc.

2.2 MATERIALS

- A. Aluminum Sheets: Extruded aluminum sections, Alloy 6063, T6 temper.
- B. Structural Supports: Extruded aluminum sections, Alloy 6063, T6 temper.
- C. Fasteners: Manufacturer's standard non-corrosive types, with heads gasketed.

- D. Accessories: Provide components required for a complete prefabricated walkway canopy system, including fascia, trim, closures panels matching deck profile at all open canopy flutes over structure and other canopy components, clips, fillers, and similar items. Match materials and finishes of prefabricated walkway canopy framing.
- E. Finish and color selection of each component shall be chosen from the manufacturer's color selections and shall include:
 - 1. Hardcoat bronze anodized finish (minimum thickness of 0.7 mils).

2.3 FABRICATION

- A. General: Fabricate and finish canopies and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and dimensional requirements. Internal gutters shall connect to weep system.
- B. Wall-mounted Suspended Canopies:
 - 1. Hanger Rods: Round aluminum rods with baked enamel finish.
 - 2. Gutter shall scupper out at each end.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine surfaces to receive prefabricated walkway canopies for conditions that will adversely affect the execution and quality of work. Do not start this work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. General: Comply with canopy fabricator's and material manufacturer's instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor supports and other components of the work securely in place, with provisions for thermal and structural movement. Install expansion joints to provide for thermal and structural movement.

3.3 CLEANING AND PROTECTION

- A. Damaged Units: Replace canopies and other components of the work which have been damaged or have deteriorated beyond successful repair by means of finish touch-up or similar minor repair procedures.
- B. Cleaning: Upon completion of canopy installation, clean finished surfaces as recommended by canopy manufacturer, and maintain in a clean condition during construction.

END OF SECTION

SECTION 10 75 00

FLAGPOLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Flagpoles and flags.
- B. Related Sections:
 - 1. Section 32 13 13 - Concrete Paving: concrete for flagpole base.

1.2 SUBMITTALS

- A. Product Data: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. Submit product data for flags.
- B. Shop Drawings: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. Include manufacturer's installation instructions.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide flagpole assemblies, including anchorages and supports, capable of withstanding the effects of wind loads, determined according to NAAMM FP 1001, "Guide Specifications for Design of Metal Flagpoles".
- B. Basic Wind Speed: 120 mph; 3-second gust speed at 33 feet above ground.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Provide flagpoles as manufactured by one of the following:
 - American Flagpole; a Kearney-National Inc. Co.
 - Baartol Co., Inc.
 - Concord Industries, Inc.
 - Ewing International
 - Morgan-Francis Div.; Original Tractor Cab Co., Inc.
- B. Provide flags as manufactured in the United States as supplied by United States Flag Store or supplied locally by In the Wind (phone 817.626.3524).

2.2 FLAGPOLE

- A. Pole: External halyard, cone tapered aluminum.
 - 1. Material: Seamless alloy 6063-T6 aluminum tubing uniformly cone tapered.
 - 2. Height 40'-0" exposed.
 - 3. Finish: Dark bronze anodized.
- B. Fittings: Furnish fittings equal to the following:
 - 1. Anodized aluminum ball: Sized to match pole butt diameter.
 - 2. External Halyard Ball-Bearing, Nonfouling, Revolving Truck assembly of cast metal with continuous braided polypropylene halyard and 9" cast-metal cleats with fasteners. Finish exposed metal surfaces to match flagpole.
 - 3. Provide one halyard and one cleat.
 - 4. Provide cast-metal cleat covers, finished to match flagpole, secured with cylinder locks.
 - 5. Collar: Spun aluminum, same finish as flagpole, 14" diameter, 2-1/2" high.
 - 6. Two-Flag Arrangement: Provide two beaded retaining loops (one at the bottom of each flag) and four swivel snaps per flagpole, of bronze with neoprene or nylon covers.

- C. Foundation Tubes: Standard weight steel pipe having self-centering fins, centering bolts, and lightning ground spike. Hot-dip galvanize the assembly after fabrication.

2.3 FLAGS

- A. United States Flag: American Flag 4ft x 6ft Valley Forge Koralex II 2-Ply Sewn Polyester as supplied by United States Flag Store (phone 877.734.2458 web site: www.united-states-flag.com). Flag shall be manufactured in the United States.
- B. Texas Flag: Texas Flag 4ft x 6ft Sewn Polyester as supplied by United States Flag Store (phone 877.734.2458 web site: www.united-states-flag.com). Flag shall be manufactured in the United States.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Paint portions of pole below grade with heavy coat of bituminous paint.

3.2 INSTALLATION

- A. Set foundation tube accurately and hold in position until concrete is placed.
- B. Install flagpole and fittings in accord with shop drawings and manufacturer's instructions.
- C. Reeve the halyard through the truck sheave and connect the free ends together as recommended by the pole manufacturer to form a closed loop halyard.
- D. Deliver United States flag and Texas flag to the Owner at project site.

3.3 ADJUSTING

- A. Adjust fittings for smooth operation of halyard.

END OF SECTION

SECTION 10 99 00

MISCELLANEOUS SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

1. Knox Box.
2. Knox FDC Caps.

B. Related Sections:

1. Section 06 10 00 - Rough Carpentry; blocking.
2. Division 26 - Electrical; connection to Security System.

1.2 SUBMITTALS

- A. General: Submit following items in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Product Data: Include complete manufacturer's catalog cuts and data sheets, complete parts list, installation requirements, and all pertinent performance characteristics and criteria.
- C. Shop Drawings: Indicate materials, construction, sizes, quantities, finishes, mounting attachments, and installation details.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in the engineering and manufacturing of product, with not less than 5 years of experience.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, handle, and protect products in accordance with SECTION 01 65 00 - PRODUCT DELIVERY REQUIREMENTS and SECTION 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Knox Box: Fire/Rapid Entry System as manufactured by The Knox Company.
 1. Model 3200 RTS with 3200 RMK Recessed Mounting Kit.
 2. Model 3200, surface mounted.
- B. Knox FDC Caps:
 1. Model 3043 bright stainless cover as manufactured The Knox Co. in size as required by plumbing drawings and as required by jurisdiction. [use for siamese FDC caps]
 2. Model 5001/5002 StorzGuard hard-anodized aluminum cover as manufactured by The Knox Co. in size as required by plumbing drawings and as required by jurisdiction.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrate surfaces as recommended by manufacturer.

3.2 EXAMINATION

- A. Verify that surfaces and conditions are ready to receive work of this Section.
- B. Notify Architect of any existing conditions which will adversely affect execution.

- C. Beginning of execution will constitute acceptance of existing conditions.

3.3 INSTALLATION

A. Knox Box:

1. Surface Mounted:

- a. Mount the Knox Box unit with the yellow mounting marker pointing up so that the small moisture drain hole is on the bottom side.
- b. Use a small level to plumb the box square.
- c. Use at least 4 mounting fasteners (Carriage Bolts, etc.) of 5/16" diameter, bolting completely through solid, secure wall. The Knox Box unit may also be welded in place. NOTE: Do not mount unit on drywall, plywood, pressboard or any other limited strength materials.
- d. To install door, first attach retaining chain through the hole in the chain tab on the back side of the door and close link with pliers. Door should be inserted bottom side first so that tail piece fits over bottom of door frame. Top of door will now swing shut.

- B. Knox FDC Caps: Install FDC caps on the fire hydrants and siamese connections in strict compliance with manufacturer's written instructions and recommendations.

3.4 ADJUSTING

- A. Adjust and fit items to be flush with adjacent construction.
- B. Fasten or adhere for tight connections and joints.

3.5 PROTECTION

- A. Protect the completed work from damage.
- B. Replace damaged items which cannot be repaired.
- C. Protect finished installation in accordance with SECTION 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS.

3.6 CLEANING

- A. Upon completion of the building, clean area. Leave products free of defects and in ready-to-use condition.
- B. Perform final cleaning in accordance with SECTION 01 74 13 - PROGRESS CLEANING.

END OF SECTION

SECTION 11 31 00

APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Appliances.
- B. Related Sections:
 - 1. Section 12 32 16 - Manufactured Plastic-laminate-clad Casework
 - 2. Division 22 - Plumbing: plumbing rough-in.
 - 3. Division 26 - Electrical: electrical rough-in.

1.2 SUBMITTALS

- A. General: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
- B. Product Data: Include list of optional features, operating characteristics, and dimensions of individual appliances.
- C. Operating and Maintenance Manuals: Provide per SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA.
- D. Shop Drawings: Submit rough-in drawings showing dimensioned locations of electrical and plumbing stub-outs for appliances.

1.3 QUALITY ASSURANCE

- A. Regulatory Requirements: Provide electrical components required as part of appliances that are listed and labeled by UL and that comply with applicable NEMA standards.
- B. Accessibility Standards: Where appliances are required to comply with accessibility requirements, comply with Texas Accessibility Standards (TAS).

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Appliances shall be of the quality manufactured by Whirlpool Corp. and U-Line Corp. and are listed by Whirlpool and U-Line catalog numbers for convenience in identification. The use of a catalog number as a description of an item shall be taken to include the description or specification for the item in the manufacturer's catalog. Equivalent items of the following manufacturers are acceptable:
 - Hotpoint
 - GE Appliances
 - KitchenAid
 - Maytag

2.2 EQUIPMENT

- A. Refrigerator: Provide Model WRT148FZD as manufactured by Whirlpool. Color as selected by Architect, 18 cu.ft. (Refrigerator-13/Freezer-5), Energy Star, freezer-on-top auto defrost, include optional automatic ice maker.
- B. Clothes Washer: Provide Duet® Model No. WFW560CHW, White ONLY, HE front load, 4.3 cu. ft. capacity, Energy Star Qualified, ADA compliant, clothes washer as manufactured by Whirlpool.
- C. Clothes Dryer: Provide Duet® Model No. WED560LHW, White ONLY, HE front load, 7.4 cu. ft. capacity, Energy Star Qualified, ADA Compliant, electric clothes dryer with wrinkle shield as manufactured by Whirlpool.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for piping systems to verify actual locations of piping connections before appliance installation. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Comply with manufacturer's written instructions.
- B. Built-in Appliances: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.
- C. Freestanding Appliances: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate appliances.

3.3 CLEANING AND PROTECTION

- A. Test each item of appliances to verify proper operation. Make necessary adjustments. Verify that accessories required have been furnished and installed.
- B. Remove packing material from appliances and leave units in clean condition, ready for operation.
- C. Protection: Protect the completed work from damage.

END OF SECTION

SECTION 11 40 00

FOODSERVICE EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions and General Documents, apply to the Work specified in this Section.

1.2 SUMMARY OF THE WORK

- A. Project Name and Location: EMS ISD Agriculture Science Center
Fort Worth, Texas,
- B. Approval of Working Surface: any contractor performing work over the work of other contractors shall notify the Architect of any unsatisfactory conditions. Beginning of work by any contractor shall constitute acceptance of the previous work.
- C. Checking Dimensions at Site: before ordering any materials or doing any work, verify all measurements of the building and be responsible for the accuracy of them. No extras will be allowed for variations from drawings in existing conditions or for work performed under this contract. Any discrepancies found shall be submitted to the Architect or Foodservice Consultant for instructions before proceeding.
- D. Cutting and Patching: No excessive cutting will be permitted, nor shall any structural members be cut without the written approval of the Architect. Each Contractor shall leave all chases and openings straight, true and of the proper size in his work as may be necessary for the proper installation of his and other contractors' work. After such work has been installed, he shall carefully fit around, close up, repair, patch and point up same as directed, to the entire satisfaction of the Architect.
- E. Cooperation: The General Contractor, all other contractors and all subcontractors shall coordinate their work with all adjacent work and shall cooperate with all other trades to facilitate the general progress of the work. Each trade shall afford all the other trades every reasonable opportunity for installation of their work and storage of their material.
- F. Inspection and Tests: Architect, Owner, Foodservice Consultant and their representative shall at all times have access to the work whether it is in preparation or progress. Provide proper and safe facilities for such access and inspection.
- G. Fees, Permits and Inspections: secure and pay fees for all permits, licenses and inspections as required by all authorities having jurisdiction. Give all notices and comply with all laws, ordinances, codes, rules, regulations and contract requirements bearing on the work.

1.3 SCOPE

- A. Include the Work specified, shown or reasonably inferable as part of Foodservice Equipment. Portions of this Work may be subcontracted to those qualified to do such work, as may be necessary because of jurisdictional trade agreements and restrictions.
- B. The General Contractor is responsible for Related Work specified in other Sections: i.e. final plumbing, electrical and mechanical connections. The Foodservice Equipment Contractor is responsible for all internal connections when specified.
- C. Specifications and drawings have been prepared to form the basis for procurement, erection, startup and adjustment of all equipment in this contract. Plans and specifications shall be considered as mutually explanatory and work required by one, but not by the other, shall be performed as though required by both. Items required by one, but not by the other shall be provided as though required by both. Work shall be accomplished as called for in specifications and shown on drawings, so that all items of equipment shall be completely functional for purpose for which

they were designed. Provide all necessary material, tools, equipment and labor required for the complete installation. When there is any discrepancy between drawings and specifications, bidders should seek clarification of any discrepancies from the Architect/Consultant prior to bidding.

- D. Should the drawings disagree in themselves, or the specifications with the drawings, the better quality, more stringent, and/or greater quantity of the work or materials shall be completed without additional costs to the Owner.

1.4 OTHER DIVISIONS/CONTRACTORS RELATED WORK

- A. Division 03 (Concrete) is responsible for but not limited to:

1. Slab depressions reinforced concrete wearing bed at prefabricated cold storage assemblies.
2. Concrete or masonry platforms (with a finished top and coved base at the perimeter) for the raised setting of food service equipment.
3. Slab depressions to receive stainless steel drain trench liner/grate assemblies (provided under this Section).

- B. Division 09 (Finishes) responsible for but not limited to:

1. Interior finished floor with a coved base at prefabricated cold storage assemblies.

- C. Division 10 (Specialties) responsible for but not limited to:

1. S/S Corner Guards throughout the kitchen (unless specified otherwise).
2. Lockers.

- D. Division 22 (Plumbing) is responsible for but not limited to:

1. All connections shall follow local codes and national standards, except where plans and specifications exceed those codes and standards.
2. Empty PVC and wide-sweep bends for refrigerant piping to beverage lines, Co2 lines, and remote food service equipment refrigeration systems.
3. Rough-in and final connection of plumbing systems to food service equipment and between components (including materials and labor). Accessories provided loose with food service equipment by Section 11 40 00 to be field installed by Division 22. This includes but is not limited to the installation of all faucets (water fill faucets, pre-rinse faucets, etc.), hoses, gas disconnects, and drains from the equipment point of connection to building plumbing systems.
 - a. Kitchen Equipment Contractor is responsible for providing all faucets (water fill faucets, pre-rinse faucets, etc.), drain fittings, mixing valves, control valves, water pressure regulators, vacuum breakers, and all accessories for equipment specified under 11 40 00. Division 22 is responsible for installation.
4. Indirect drain line runs from the equipment to the nearest drain or floor sink—lines to be type 'K' Copper.
5. If any plumbing accessories or fittings are provided loose with equipment by 11 40 00, Div. 22 is to attach to equipment and provide final connection.
6. Gas Supply Systems with all components and fittings required for a complete system.
7. Water Supply Systems with all components and fittings required for a complete system.
8. Compressed Air Systems with all components and fittings required for a complete system.
9. Piping and Drainage Systems (Sanitary and grease laden). Systems are to be cleaned before the final connection with food service equipment.
10. Floor Sinks (Provide and Install). Flange and grates to be flush with the finished floor.
11. Floor Drains (Provide and Install). Flange and grates to be flush with the finished floor.
12. Trench Drains (Provide and Install). Trench Liners provided by 11 40 00. Flange and liners to be flush with the finished floor.
13. Grease Traps as required (Size, Provide, Locate, and Install). Verify with local codes to bypass or pipe thru Grease Trap and/or Interceptor.
14. P-Traps as required (including all disposers).
15. Interconnect water thru Water Filter (Filter provided by 11 40 00 unless otherwise specified) to equipment.

16. Gas Quick Disconnect Installation (Quick Disconnect provided by 11 40 00).
17. Safety Restraint Cable Installation (Safety Restraint Cable Provided by 11 40 00).
18. Specified couplings and piping to all equipment furnished by 11 40 00.
19. Air Compressors (Size, Provide, and Install unless otherwise specified).
20. Water Softeners (Size, Provide, and Install unless otherwise specified).
21. Pressure Boilers (Size, Provide, and Install unless otherwise specified).
22. Hand Sinks (Provide (unless otherwise specified) and Install). Provide a hot water tempering valve if required. Water temperature to be at least 100 degrees and flow for at least 20 seconds.
23. Ice Bin Drain Insulation (Provide and Install).
24. Unions at disposer solenoid valves (Provide and Install).
25. Back Flow Prevention as required (Provide and Install - including all disposers). Back-Siphonage shall be installed at all fixtures and equipment where backflow and/or back-siphonage may occur and where a minimum air gap cannot be provided between the water to the fixture or equipment at its flood/level rim. When furnished with equipment, vacuum breakers shall override the above if acceptable with applicable codes. Division 22 is responsible for verifying requirements with local codes.
26. Janitor Sink with Faucet (Provide and Install).
27. Freeze Proof Hose Bibb at the exterior of the building by receiving door (Provide and Install - unless otherwise specified).
28. Reverse Osmosis Systems (Size, Provide (unless otherwise specified), Locate, and Install).
29. All piping within the counter body or under fabricated counters must be run to a connection point below the counter body by Section 11 40 00—final connection by Division 22.
30. Exhaust Hood condensate drain connections (Provide and Install).
31. Interconnection of ½" CW to Pre-Rinse and Disposers cone/body inlets piped through the solenoid and vacuum breaker.
32. Fire System Piping. The exposed piping is to be chrome plated.
33. Pipe ½" cold water to swirl inlets at disposers.
34. Water Treatment for Ice Builders (Non-Chlorinated water with a PH Level of 10 or Higher) and any drains and overflows. Piping from Ice Builders to Tumble Chillers by Div. 23.
35. Refer to Section 2.2 PLUMBING / MECHANICAL REQUIREMENTS for additional information.

E. Division 23 (Mechanical) responsible for but not limited to:

1. All connections shall follow local codes and national standards, except where plans and specifications exceed those codes and standards.
2. Empty EMT Conduit with pull-wire and wide-sweep bends for refrigerant piping to remote food service equipment refrigeration systems.
3. Rough-in and final connection of mechanical systems to food service equipment, cold storage assemblies, and between components (including materials and labor).
4. A mechanical contractor will test and balance rooms and exhaust hoods. Balance report for food service Exhaust Hoods to be provided to Foodservice Design Professionals (FDP) immediately upon completion (send to Dallas.Submittal@fdp.org) and must be submitted with O&M manuals.
5. Exhaust Hoods, Condensate Hoods, Fire Suppression Systems, connections, and controls (Provide and Install – unless otherwise specified). Provide tempered air at all supply ducts.
 - a. If Exhaust/Condensate Hoods and Fire Suppression Systems are specified under Section 11 40 00, Division 23 is responsible for all Exhaust and Condensate Hood connections (Provide and Install).
6. VFD System and controllers when required by code (Provide and Install).
7. Provide and install all ventilation (direct or indirect), air conditioning, and heating systems (unless otherwise specified).
8. Coordinate Supply and Return ducts above Serving Counters. Cold air is not to blow directly on hot food counters or open-air refrigerated merchandisers.
9. Coordinate Supply and Return ducts away from equipment with top-mounted refrigeration. Air is not to blow directly on compressors.
10. Mechanical Contractor to locate temperature monitors within return ducts.
11. Circulating air above cold storage assemblies (Provide and Install).
12. Circulating air above and in air gaps at Warehouse cold storage assemblies (Provide and Install).
13. Water Chillers as required (Provide, Size, and Locate).
14. Piping from Ice Builders to Tumble Chillers (Size, Provide and Install).

15. Refer to Section 2.2 PLUMBING / MECHANICAL REQUIREMENTS for additional information.

F. Division 26 (Electrical) responsible for but not limited to:

1. Rough-in and final connection of electrical systems to food service equipment, cold storage assemblies, and between components (including materials and labor). Accessories provided loose with food service equipment by Section 11 40 00 to be field installed by Division 26.
2. Empty EMT Conduit with pull-wire and wide-sweep bends for refrigerant piping to remote food service equipment refrigeration systems.
3. Empty EMT Conduit with pull-wire and wide-sweep bends for interconnect cables between LAN and POS terminals, change-makers, pre-check units, printers, CPUs, etc. Division 26 to verify where the conduit will run for POS System (i.e., Manager's Office or IDF Room).
4. Empty EMT Conduit with pull-wire and wide-sweep bends for fire suppression systems. Interconnect the Fire Protection System to panel box shunt trips and building alarms.
5. Cold Storage Assembly Light Fixture Installation (Provided loose by Section 11 40 00).
6. Table Limit Switch Installation (Provided loose by Section 11 40 00).
7. Electrical Materials and Devices (Shunt-trip breakers, surge protectors, lighting control devices, conduit, wire, etc.).
8. Switches and Stainless Steel Disconnects as required (Provide, Locate, and Install – to be in an accessible location).
9. Charging Stations for Forklifts, Pallet Stackers, and Pallet Jacks (Size, Provide, Locate, and Install).
10. Interconnection between Condensate Fan and Dishmachine control panel.
11. Interconnection between Exhaust Hood fans and switch.
12. Interconnection between Exhaust Hood lights and switch.
13. Door Heaters, Lights, Coils, and Heated Pressure Relief Ports pre-wired to the junction box at the top of cold storage assemblies provided by Section 11 40 00—final connection by Div. 26.
14. If any electrical accessories, fittings, and cord/plugs are provided loose with equipment by 11 40 00, Div. 26 is to attach to equipment and provide final connection.
15. Provide waterproof receptacles in wet areas.
16. All electrical connections beneath Exhaust Hoods to extend to shunt trip breakers with electrical panel box for shutdown during fire mode.
17. Receptacles will be pre-wired to Junction Box or Load Center for final connection by Division 26.
18. All electrical lighting, power, and distribution systems.
19. Do not interconnect more than three (3) convenience outlets on one (1) breaker.
20. Other than convenience outlets, all electrical connections on food service plans are dedicated breakers.
21. Doorbell at receiving door (Provide and Install –audible throughout Kitchen, Office, and Dry Storage room).
22. Adequate lighting at receiving door.
23. Dedicated circuit for heated drain line connection in Walk-In Freezer (120/1/16.0 Amp) at each coil.
24. Provide and install (2) Edwards 860 Series (or equal) red lens, surface-mounted Xenon Emergency Strobe Beacons. One (1) to be located in the Kitchen above Walk-In Freezer door (or Cooler door when Freezer is within Cooler in an 'inline' assembly), and One (1) to be located in the Cafetorium (Coordinate location with Owners). Provide all conduit and wiring required, and interconnect the illuminated Push Button Panic Alarm in the Walk-In Freezer to both Strobe Beacons (Critical). Coordinate with Division 27.
25. Refer to Section 2.5, ELECTRICAL REQUIREMENTS, for additional information.

G. Division 27 (Communication) responsible for but not limited to:

1. Data line coordination for food service equipment.
2. Time clocks.
3. Video cameras for learning assistance in food service areas as required (Provide, Locate, and Install).
4. Provide conduit, data line, and interconnect the illuminated Push Button Panic Alarm inside the Walk-In Freezer to the Building Automation System (BAS). When activated, facility personnel are to be notified - coordinate notification requirements with the Owner (Critical). Coordinate with Division 26.

- H. Division 28 (Electronic Safety and Security) is responsible for but not limited to:
 - 1. Security Cameras as required (Provide, Locate, and Install).
 - 2. Interconnection of Entrapment Panic Alarm for Cold Storage Assembly to the main Building Alarm System that will notify the person designated by the Owner that the Entrapment Panic Alarm has been activated (*Critical*).
- I. General Contractor responsible for but not limited to:
 - 1. Any wall penetration required for food service equipment utilities. Escutcheon plates or S/S sleeves are to be provided and installed as needed.
 - 2. Bulk Freezer Ventilation Pipe (Provide and Install unless otherwise specified).
 - 3. Core drilling for Guide Rails.
 - 4. Refrigeration Roof Curbs / Roof Jack.
 - 5. Interior Bollards – to be epoxy painted per local codes (Provide and Install).
 - 6. Provide and Install ¾" Plywood blocking in the wall for mounting equipment furnished by Section 11 40 00 as required.
 - 7. Cold Storage Assembly Depressions (to be dead level) and sand leveling bed.
 - 8. Structural bracing for Bulk Cold Storage Assembly ceiling panels if required.
 - 9. Menu System Video Monitors in Servery (unless otherwise specified).
 - 10. Structural bracing for Menu System Video Monitors if required.
 - 11. Interior/Exterior refrigeration penetrations and sleeves at building penetrations.
 - 12. Door Scope viewer (peephole) with wide viewing angle at receiving door.
 - 13. Canopy at receiving door. Coordinate height with the height of Receiving Door (8') and the mounting height of Air Screen above the door.
 - 14. Soap and towel dispenser provided by Owner. G.C. is responsible for installation.
 - 15. Washer and Dryer (Provide and Install, unless otherwise specified).
 - 16. Dwarf wall at exposed front/ends of cafeteria serving counters with the finish as selected by the Architect.
 - 17. Final cleaning of all equipment before demonstrations.

1.5 QUALITY ASSURANCE

- A. In addition to complying with all applicable laws, statutes, building codes and regulations of public authorities, comply with the following:
 - 1. National Sanitation Foundation (all equipment to bear label).
 - 2. National Electric Code.
 - 3. Underwriters' Laboratories, Inc. (all applicable equipment to bear label).
 - 4. CSA certified (all applicable equipment to bear label)
 - 5. American Gas Association Laboratories.
 - 6. National Fire Protection Association.
 - 7. Americans with Disabilities Act.
 - 8. Food and Drug Administration HACCP Guidelines.
 - 9. International Energy Conservation Code(IECC).
 - 10. Department of Energy.
 - 11. Environmental Protection Agency
- B. Furnish certification of regularly manufactured equipment listing or classification by Underwriter's Laboratories, Inc. with initial submittal.
- C. Furnish list of equipment and components (internal and external) that are not of domestic origin. All equipment and components (internal and external) should be of domestic origin when possible. This information should be provided with the initial submittal.
- D. Projects outside the continental United States shall adhere to all local authorities having jurisdiction over that project.

1.6 SUBSTITUTIONS

- A. Equipment items or components specified are intended to be the Basis of Bid. All other brands, including any additional names, which may be listed as "Alternates" or "Approved Equal," must

conform with the specifications, size, accessories, function, etc. of the first-named brand and be subject to Paragraph C-03 of this Article.

B. Proposed Substitutions:

1. Submitted no less than 14 calendar days prior to Bid Date.
2. Submit proposed substitutions with catalog data and/or manufacturer's shop details indicating all modifications required to conform with specified brand.
3. List of deviations must include listing of equipment name, model number, accessories and features with deviation(s) noted for both specified and proposed alternate equipment. Equipment without listed deviation(s) will be considered to be furnished as specified.

C. Substitutions with prior approval:

1. Submitted on Bidder's letterhead attached to Proposal Form with individual additive/deductive amounts stipulated and the documentation required in Paragraph B02.
 2. Owner reserves the right to accept or reject any or all substitution proposals before execution of Contract.
 3. Provide all design/engineering services required to make adjustments in space, systems, utilities, etc. and pay all additional costs of utilities, construction or professional services that may be incurred due to the acceptance of any substitution.
- D. All appliances within common group or category (e.g., refrigerators, kettles, ovens, etc.): same manufacturer.

1.7 INTERPRETATION OF DOCUMENTS

- A. During Bidding: contractor's, supplier's or vendor's questions and comments pertaining to Construction Document's clarity or intent will be addressed by addendum.
- B. Subsequent to Award:
1. Confirmation of Construction Document requirements will be provided by Clarification Bulletin.
 2. Request for Information Bulletins submitted by Contractor: contain Contractor's proposed resolution.

1.8 WARRANTY

- A. Provide a written warranty for a period of one year from the date of Substantial Completion, including extended four-year replacement warranty on compressor bodies.
- B. Components of equipment subject to replacement prior to one-year's use (such as refrigerator door gaskets) and those items which may fail due to improper or inadequate periodic maintenance by the Owner/Operator (such as an uncleaned refrigeration system condenser) are not intended to be included within the scope of the Warranty.
- C. Refrigeration Systems/Equipment: one-year free service available within twenty-four hours of notification.
- D. Furnish three copies of a list of all equipment and their respective local service agencies, indicating the address, telephone number and name of person to contact. Whenever possible, the service agencies selected shall be factory-authorized for the equipment assigned.
- E. Provide following for refrigeration systems/equipment, unless specified otherwise:
1. One (1) year free service available within twenty-four hours of notification, for refrigeration systems.
 2. Provide five (5) year manufacturer's registered written replacement, warranty certificate, covering compressor bodies. Warranty to cover labor costs for first year.
 3. Provide ten (10) year manufacturer's registered written replacement/repair, warranty certificate, covering walk-in panels. Warranty to cover defects in material and workmanship. Warranty to cover labor costs for first year.

4. Provide two (2) year parts and labor warranty for all parts/components (including third-party components that may be utilized) of the refrigeration system(s) (including freon), cold storage cooler(s), and freezer(s) not otherwise covered herein.
- F. All above-stated warranty periods are from the date of Substantial Completion. All replacement parts due to a warranty call should be the same quality as the original, or better if the original were defective. Replacement parts should be of a domestic origin where possible.

1.9 SUBMITTAL DATA

- A. Special Requirements: the following are in addition to any general requirements given elsewhere in the Documents.
- B. Submittal Requirements:
 1. Kitchen Equipment Contractor to furnish all submittals via PDF, drawings to be scaled per General Specifications and provided in Three (3) submittal packages.
 2. Foodservice Design Professionals requires the below listed business days for each package submitted. Packages to be submitted with 14 days between each issued package.
 - a. Package One: 10 Business Days
 - i. Equipment rough-in
 - ii. Equipment Brochure
 - b. Package Two: 10 Business Days
 - i. Exhaust Hood
 - ii. Cold Storage Assembly
 - iii. Refrigeration
 - c. Package Three: 15 Business Days
 - i. Custom Fabrication
 - ii. Serving Counter
 - iii. Merchandising Equipment
 - iv. Miscellaneous submittals
- C. Submittals to be identified with the below listed file name structure:
 - i. 11 4000-1 EQUIPMENT BROCHURE
 - ii. 11 4000-2 EQUIPMENT ROUGH-IN PLANS
 - iii. 11 4000-3 CUSTOM FABRICATION
 - iv. 11 4000-4 SERVING COUNTER
 - v. 11 4000-5 EXHAUST HOODS
 - vi. 11 4000-6 COLD STORAGE ASSEMBLY
 - vii. 11 4000-7 REFRIGERATION
 - viii. 11 4000-8 BEVERAGE MERCHANDISER
- D. Package One (1) requires both submittals-Brochure and Rough-in plans. If not sent together, submittal will be rejected.
- E. All submittals will be notated in RED, architect, and general contractor to be colored per their direction.
- F. If hard copy submittals are required, kitchen contractor to furnish all hard copies as required to the specified trades.
- G. If discrepancies, missing information, or incorrect information occur within the documents, kitchen contractor to seek clarification or clearly notate on submittals the need for further direction. Kitchen contractor is to bid the higher of the discrepancy. Per General specifications (Section 1.3. Scope subparagraph D)..

H. Brochure Format (for regularly-manufactured equipment and components):

1. Front and rear protective cover with labeled project name.
2. Brochure index: indicate functional Area/Room number, item number, quantity, description and manufacturer.
3. A separate flysheet for each component or item of equipment, indicating: item number, name, quantity, manufacturer, optional equipment, modifications, special instructions and utility requirements. An item of equipment or assembly containing more than one buyout sub-assembly or component shall have the secondary item listed in parenthesis beside the primary item name. For example: Serving Counter (hot food well).
4. Catalog specification sheet and manufacturer's drawing.

I. Shop Drawings (Rough-In Drawings):

1. Separate drawing sheets: same size as Contract Drawings (Contract Drawings are not to be traced or reproduced). Submittal drawings are to be provided by Kitchen Equipment Contractor and not reproduced from Contract Documents. Any reproduced submittal drawings will be rejected.
2. $\frac{1}{4}$ " scale drawing of fixed/movable Foodservice Equipment and pre-fabricated Cold Storage Assemblies with itemized schedules.
3. Special Conditions Drawings, sizing and locating the following conditions:
 - a. Slab depressions, cores, sleeves or block-outs (cold storage assemblies, drain trenches, piping, etc.).
 - b. Concrete or masonry platforms.
 - c. Pipe sleeves or roof jacks.
 - d. Wall-openings or block-outs for pass-through equipment, recessed control panels, in-wall fire-protection system components, etc.
 - e. Blocking grounds or anchor plates required in walls for equipment support/attachment.
 - f. Above-ceiling hanger assemblies for support of exhaust hoods, utensil-racks, etc.
 - g. Access panels in walls or ceiling for service of equipment.
 - h. Ceiling pockets or recesses for unusually high equipment.
 - i. In-wall carriers for wall-hung or cantilevered equipment.
4. Electrical rough-in drawing.
5. Plumbing/mechanical rough-in drawing.
6. Required information:
 - a. All fixed and movable Foodservice Equipment shown on Contract Drawings.
 - b. All prefabricated Cold Storage Assemblies and Conveyor/Dishtable Assemblies shown on Contract Drawings.
 - c. All general-use and convenience utilities or services indicated on Contract Drawings, including those required by or connected to equipment or devices not in this Section.
 - d. All rough-in drawings: fully dimensioned from engineering benchmark (column lines, when provided) and finished-room surface to point of stub-up through floor and stub-out through wall or ceiling for all mechanical, electrical and plumbing services.
 - e. Connection number/tag system and symbols: identical to Contract Drawings.

J. Shop Drawings (Manufacturer's and Fabricator's):

1. Sheet Size: identical to Contract Drawings, drawn or plotted at $\frac{3}{4}$ " scale for plan view and elevations; $1\frac{1}{2}$ " scale for sections and construction details.
2. Included information: item number, name and quantity.
3. Construction details, sections and elevations to reflect requirements of the Specifications and Drawings.
2. Indicate adjacent walls, columns and equipment.
3. Indicate plumbing and electrical schematic drawings for equipment such as: conveyors, waste systems, self-cleaning exhaust hoods, exhaust hood fire protection systems and fabricated fixtures with single electrical or plumbing connection.
4. Mechanical or electrical operating components or products integrated into a fabricated fixture: ventilation and service access required or recommended by the manufacturer,

including panel size and location to permit easy lubrication, adjustment or replacement of all moving parts.

- K. All equipment and engineering rough-in plans sheet numbers are to match the contract documents. All equipment item no.'s and engineer item no.'s located on the schedules are to match the contract documents. All engineering requirements are to be updated as required to accommodate the provided equipment and/or match the contract documents. The Kitchen Contractor is responsible for the coordination of any MEP revisions to accommodate the provided and proposed equipment. The kitchen contractor is responsible for any costs associated with equipment substitution.
- L. FDP drawings and schedules are not to be copied in anyway. Any replicated drawings of FDP will be rejected.

1.10 SERVICE MANUAL

- A. Three copies bound in 1½" hardback, three-ring binders (as many volumes as required by scope of project) with same data as brochure at completion of installation (Refer to "Submittal Data"). Provide separate service manuals as required for each independent area within the project scope (Main Kitchen, Culinary, Concession, etc.).
- B. Each Volume: section for maintenance of finish materials (e.g., stainless steel, plastic laminates, FRP, Plexiglas, etc.).
- C. Catalog specification sheet and/or manufacturer's shop drawings.
- D. Each Volume: index of items, manufacturer's operating/maintenance information, replacement parts data and price lists. Provide the name, title and address of personnel at each respective manufacturer to be contacted for spare/replacement parts after warranty period.
- E. To the extent possible, provide two copies of manufacturer's video instructional cassettes for operating, maintenance and service of equipment.
- F. Internally subdivide binder contents with permanent page dividers, logically organized by equipment item number or manufacturer name, with tab titling clearly printed under reinforced laminated plastic tabs.
- G. Electronically submitted manuals are required to follow the same formatting requirements listed above.

1.11 VERIFICATION AND COORDINATION OF PROJECT / DATA

- A. Utilities Rough-in Drawings and Field-Services within four weeks after receipt of notice-to-proceed, review Contract Drawings and Submittal Data for accuracy and completeness and notify Architect of conflicts and proposed adjustments. Coordinate work with other sub-contractors.
 - a. KEC to provide on-site field verification of all underground utilities prior to pouring of concrete for capacity and location, coordinate with General Contractor. Submit review to Architect and General Contractor.
 - b. KEC to provide on-site field verification of all other utility connections and locations, coordinate with General Contractor. Submit review to Architect and General Contractor.
- B. ON-SITE INSPECTION REPORTS
 - a. Prior to concrete pour. (KEC to submit a copy of the report below to the Architect, General Contractor and Foodservice Consultant within 24 hours of the inspection.)
 - b. Prior to delivery of equipment. (KEC to submit a copy of the report below to the Architect, General Contractor, and Foodservice Consultant with-in 24 hours of the inspection.)



On - Site Inspection Report
Prior to Concrete Pour

Inspection Date _____ Project Name _____

Project Location _____

Inspector's Name _____ Company _____

Inspector's Contact Number _____ Email _____

Architectural Firm _____ Project Architect _____

Architect's Contact Number _____ Email _____

General Contractor _____ Project Manager _____

G.C. Contact Number _____ Email _____

Foodservice Consultant **FDP**
Consultant Number - Dallas 972-245-5300
Consultant Number - Houston 281-350-2323

Project Manager _____
Email _____

An on-site inspection to verify the location of underground utilities was conducted on this date. The following conditions were observed and brought to the attention of the General Contractor. (KEC is to provide a written description and copy of the Utility Plan indicating the corrective action required).

1. What difficulties were encountered?

Inspector's Initials _____

This Inspection Report is the responsibility of the Kitchen Equipment Supplier and the General Contractor. Coordination between the two parties is mandatory. Neither the Architect nor the Kitchen Consultant need to be present at any of the inspections.

EMAIL A COPY OF THIS REPORT AND ANY ADDITIONAL INFORMATION TO THE ARCHITECT, GENERAL CONTRACTOR AND FOODSERVICE CONSULTANT.



On - Site Inspection Report
Prior to Delivery of Equipment

Inspection Date _____ Project Name _____

Project Location _____

Inspector's Name _____ Company _____

Inspector's Contact Number _____ Email _____

Architectural Firm _____ Project Architect _____

Architect's Contact Number _____ Email _____

General Contractor _____ Project Manager _____

G.C. Contact Number _____ Email _____

Foodservice Consultant **FDP** Project Manager _____

Consultant Number - Dallas 972-245-5300

Consultant Number - Houston 281-350-2323

Email _____

An on-site Inspection to verify the location of installed utilities was conducted on this date. The following conditions were observed and brought to the attention of the General Contractor. (KEC is to provide a written description and copy of the Utility Plan indicating the corrective action required).

1. What difficulties were encountered?

Inspector's Initials _____

This Inspection Report is the responsibility of the Kitchen Equipment Supplier and the General Contractor. Coordination between the two parties is mandatory. Neither the Architect nor the Kitchen Consultant need to be present at any of the inspections.

EMAIL A COPY OF THIS REPORT AND ANY ADDITIONAL INFORMATION TO THE ARCHITECT, GENERAL CONTRACTOR AND FOODSERVICE CONSULTANT.

- C. Review critical systems/components for application, performance and capacity and submit calculation worksheets with initial submission of brochure/rough-in drawings, with all proposed adjustments noted, including:
 - 1. Exhaust hood removal/supply air volume, velocity, static pressure, duct collar sizes and locations.
 - 2. Refrigeration Systems (compressor, condenser and evaporator) capacities/sizes, quantities and refrigerant piping distances/sizes.
 - 3. Exhaust Hood Fire Suppression Systems (nozzle locations, air handler and fuel interlocks, piping/distance limitations).
 - 4. Locations of Vacuum Breakers.
 - 5. Conformance of Refrigerated Components/Equipment with HACCP Guidelines (e.g., salad/sandwich pans, upright/open refrigerator cabinets, salad bars) with HACCP Guidelines.
 - 6. Gas, water line sizes and manifold configurations.
 - 7. Diameter and length of flexible connector lines for fixed/movable gas appliances.
 - 8. Fabricated Equipment load center panels (individual and total amperage calculations and circuit balance).
 - 9. ADA compliance of workstations, service positions, passageways, etc.
- D. Ceiling mounted appliances/fixtures: verify and coordinate dimensions/location of support framing/hangers with General Contractor. All material and installation below 12'-0" aff.: Section 11 4000.
- E. Dimension Responsibility: obtain actual or guaranteed measurements for proper fit of equipment. All dimensions indicated in Contract Documents are approximate and are as accurate as can be determined at the time. Field-check all horizontal/vertical measurements and conditions at the building prior to fabrication or delivery of equipment and notify the Architect of all conflicts or deviation from the dimensions shown.
- F. Checking Dimensions at Site: before ordering any materials or doing any work, verify all measurements of the building and be responsible for the correctness of them. No extras will be allowed for variations from drawings in existing conditions or for work performed under this contract. Any discrepancies found shall be submitted to the Architect for instructions before proceeding.
- G. Scheduling to Fit Openings: Should it become necessary to schedule the construction of walls or partitions before delivery of fixed equipment, the equipment must be fabricated for passage through finished openings. Maintain close contact with the project and be cognizant of all conditions, including vertical handling limitations within the building (elevator cabs or openings, stairs, etc.) and possible hoisting requirements. Coordinate all procedures with General Contractor and Project Team.
- H. Refrigerated and Dry Storage Areas: verify and coordinate dimensions to accommodate scheduled modular shelf sections. Notify Architect of variance between the Contract Documents and actual conditions.
- I. Color/Pattern Selections: submit selection samples of solid polymer products, plastic laminate, paint or stain finishes and vinyl-coated surface material of equipment as selected by Owner.
- J. Movable Equipment Interface: rolling stock (pan racks, carts, dollies, dish/tray/rack dispensers) required to fit through or into fixed equipment (roll-in refrigerators, counter bodies, etc.) is to be reviewed and coordinated for compatibility at time initial of shop drawing submittal. Indicate conflicts and proposed adjustments.
- K. Relocation of Work: relocate or re-route work as required to coordinate related items free of charge if no extra work is involved.
- L. Contractor must provide an Itemized Schedule of Values that correlates with the foodservice equipment item numbers for verification prior to submittals being submitted.

1.12 EQUIPMENT FURNISHED / INSTALLED BY OTHERS

- A. Obtain and coordinate utility requirements of Owner-Furnished/Owner-Installed (OF/OI) equipment with the building utilities and roughing-in drawings/provisions.
- B. Coordinate physical data of OF/OI appliances or equipment and incorporate information into Submittal Drawings. Vendor- or Purveyor-Furnished equipment (e.g., coffee/tea equipment): same as OF/OI.

1.13 WORK INSTALLED BUT FURNISHED BY OTHERS

- A. Coordinate delivery/installation schedule of Owner-Furnished/Contractor-Installed (OF/CI) equipment with Owner not less than ninety (90) days before equipment requirement.
- B. Obtain and coordinate utility requirements of OF/CI equipment with the building utilities and roughing-in drawings/provisions.
- C. Receive at job-site and fully incorporate into installation procedures as if furnished under this Section.

PART 2 - PRODUCTS

2.1 FABRICATED FIXTURES MATERIAL / COMPONENTS

- A. Stainless steel sheets or shapes: 18-8, Type 302, polished to 180 grit No. 4 finish.
 - 1. Stainless steel joints and seams: heli-arc welded, free of pits and flaws, ground smooth and polished to No. 4 finish.
 - 2. The "grain" direction of horizontal stainless-steel surfaces: longitudinal, including the backsplash. The polishing procedure at right-angle corners of fixtures shall provide a mitered appearance.
- B. Galvanized Iron Sheets: Armco copper bearing Zinc Grip or Zinc Grip/Paint Grip.
 - 1. Galvanized iron joints and seams: arc-welded, free of pits and flaws and ground smooth.
 - 2. Galvanized sheets or shapes: washed with mineral spirits and painted with Rustoleum gray semi-gloss enamel.
- C. Sound Deadening: Schnee Butyl Sealant ½" wide rope positioned continuously between all frame-members or contact material and underside of stainless steel surface (sinks, table tops, food wells, overselves and underselves). Tighten stud-bolts for maximum compression of sealant and trim excess.
- D. Plastic Laminates: color/pattern selected by Architect, in 1/16" thickness for flat surfaces: 1/32" thickness for radiused surfaces. Plastic laminates and adhesives must be N.S.F. approved (Standard No. 35).
- E. Solid Polymer products: color/pattern/material as selected by Architect in thickness as specified. Solid Polymer and adhesives must be N.S.F. approved (Standard No. 51).
- F. Casters.
 - 1. Fabricated fixtures with "Open Base" construction: Jarvis and Jarvis Model No. 5-405-113P- NSF swivel casters with grease seals on forks and wheels; Zerk fitting in swivel; two casters: Model No. E-75 Vertilock brakes. All casters: B-7" rolling bumpers with stainless steel top discs.
- G. Cutting Boards: 1/2" thick Read Products, Inc. "Richlite" cutting board, size as indicated.
- H. Identification Plates, Labels, Tags:
 - 1. Prohibited Information: names of suppliers, fabricators and contractors.
 - 3. NSF Labels: required on all pieces of equipment.

4. Required Information: function or purpose of controls such as display light switches, food warmer controls, etc.
5. Plate Construction: engraved phenolic plastic, secured to equipment with epoxy cement or stainless-steel screws. Furnish samples.

2.2 PLUMBING / MECHANICAL REQUIREMENTS

A. Plumbing Fittings and Components: furnished under this Section as follows:

Note: Fitting and components described in Items 1, 2, 3, 4 and 5 are furnished loose for installation by Division 22.

1. Control valves, appliance pressure regulators for water, gas and steam, and vacuum breakers: wherever required on Foodservice Equipment (chrome-plated where exposed).
2. Faucets and drains without connected overflows (unless otherwise indicated) for all sinks.
3. Specialty Foodservice water-fill faucets or hose assemblies indicated in drawings/specifications.
4. Wade Model No. W-10 Shock-Stop shock absorbers for all Foodservice Equipment with quick-opening or solenoid-operated water valves.
5. Dormont Stainless Steel Water Quick Disconnect hose, diameter per water connection size requirements, with SafetyQuick safety fitting, w/coiled restraining device, full port ball valve, antimicrobial coating, lifetime warranty.
6. Extensions of indirect waste fittings to open-sight floor sink or floor drains from sinks, under bar equipment, and food-holding components of serving counters (e.g. cold pans, hot food wells, refrigerator/freezer coils not equipped with condensate evaporators) furnished and installed by Division 22. Drains: painted with aluminum paint where exposed, type "K" copper where concealed.
7. Piping brackets and supports beneath/within fabricated equipment.
8. Closed Base Bodies: removable 18-gauge stainless steel closure panel at plumbing penetrations, under top.
9. Control valves on Open Base fixtures: mounted on 14-gauge stainless steel gusset-shaped panel with 3½" setback from counter top edge/rim to face of control handle.
10. Fill hose/faucet at support pedestals or Closed Base Body: installed in a 15" x 18" x 5" deep recessed mounting panel. Panel bottom: sloped on a 60° angle, with 3/8" stainless steel rod hanger-bracket for hose.
11. In-line water filter system:
 - a. 3M or Everpure System filters for coffee/tea brewers, icemakers, water chillers, convection steamers and beverage systems. Sized per manufacturer recommendation.

B. Gas-Heated Equipment Fittings and Components: furnished under this Section as follows:

1. Fixed Equipment: Dormont MFG brand "KITCF" Series gas hose kit with Quick Disconnect fitting at appliance. Approved equal: T&S Brass. Diameter per fuel volume/connection size requirements. Gas valve diameter size per fuel volume/connection size requirements.
 - a. Restraining device: heavy duty steel cable, fastened to equipment and walls, 3" to 6" shorter than equipment connector length.

C. Final Plumbing Connections Provisions.

1. Fabricated equipment containing components, fittings and/or devices indicated on Foodservice Connection Drawings to be connected to the building systems: each component, fitting or group thereof pre-piped to a utility compartment for final connection by Division 22. Refer to drawings for capacities.
2. Field-assembled equipment (e.g., prefabricated walk-in refrigerator/freezers, exhaust hoods, warewash machines, convection ovens, etc.): plumbing components completely interconnected under this Section for final connection arrangements indicated on Utility Connection Drawings.
3. All plumbing final connection points of equipment shall be tagged, indicating:
 - a. Item number.
 - b. Name of devices or components.

- c. Type of utility (water, gas, steam, drain, chilled water).

D. Ducts and Vents.

- 1. Exhaust hoods which are furred-in to ceiling: 2" high duct collar for final connection to duct system.
- 2. Warewash machines equipped with integral vent cowls or extended hoods: furnished with 18-gauge stainless steel seamless duct risers to 6" above finish ceiling for final connection. The duct: trimmed at ceiling with 16-gauge stainless steel angle flange with all corners welded.

2.3 FOODSERVICE EQUIPMENT REFRIGERATION SYSTEMS

- A. Install complete with all refrigerant, oil, dials, dehydrators, gauges, controls required for the proper operation of the system.
- B. Self-contained or factory-installed compressors: check and adjust to proper operating temperature prescribed by FDA/HACCP.

2.4 PLUMBING TRIM

- A. Faucets: furnished for all sinks or equipment requiring open water supply.
- B. Fill Faucets: furnished for appliances requiring open water supply.
- C. Drain Fittings: furnished for all sinks or equipment requiring removal of liquids. Install specified chrome-plated or stainless-steel fittings in die-stamped openings with washers and locknuts. Solder may be used as a sealer but shall not be applied to the top surface of the drain fittings.

2.5 ELECTRICAL REQUIREMENTS

- A. All electrical systems, components and accessories within the work of this Section: certified to be in accordance with NEC 70.
- B. Electrical Fittings and Components: furnished under this Section as follows. Coordinate foodservice equipment loads, voltage and phase with building system and confirm any existing or OF/OI equipment requirements.
- C. Cord and Caps.
 - 1. Coordinate all Foodservice Equipment cord/caps with related receptacles.
 - 2. All 120 volt "plug-in" equipment shall have Type SO or SJO cord and plug with ground wire fastened to frame/body of item.
 - 3. Cord lengths for fixed equipment: adjusted to eliminate loose-hanging excess.
 - 4. All non-fixed plug-in "buy-out" equipment: Hubbell configuration, ratings as required.
 - 5. All mobile electrical support equipment (heated cabinets, dish carts, etc.) and counter appliances mounted on mobile stands (mixers, food cutters, toasters, coffee makers, microwave ovens, etc.): 8'-0" cord length with cord-hanger strap secured to rear of equipment or mobile stand.
- D. Switches and Controls.
 - 1. Each motor-driven appliance or electrically heated unit: equipped with control switch or starter per Underwriters' Laboratories, Inc. with low-voltage and overload protection.
 - 2. Disposer controls recess-mounted in wall: external fittings and accessories removed from enclosure and furnished with 16-gauge stainless steel perimeter angle flange with welded corners. Install control at 4'-0" aff to bottom of enclosure.
 - 3. Disposer controls recess-mounted in counter-splash risers: external fittings and accessories removed from NEMA 4 enclosure and furnished with 16-gauge stainless steel perimeter angle flange with welded corners. Install control at 3'-0" aff to bottom of enclosure. Provide panel with 60" long coil of Seal-Tite electrical conduit, from bottom of control panel for final field connections under Division 26.

4. Equipment which is not provided with built-in circuit breakers or fused terminal block and is indicated on Utility Connections Drawings to be directly-connected to the building electrical system: a NEMA 4 stainless steel disconnect switch furnished and installed by Division 26.
5. All remote manual starters, disconnect switches, magnetic contactors or starters and push-button stations: NEMA Type 4 enclosure; NEMA Type 1 enclosure only when installed in a Closed Base Body.

E. Heating Elements.

1. Electrically-heated equipment: thermostatic controls.
2. Water heating equipment: equipped with positive low water shut-off.
 - a. Receptacles and Switches.
3. Receptacles installed in vertical panels of support pedestals or Closed Base Bodies: installed in 12" x 8½" x 3" deep recessed mounting panel sloped on 60o angle and turned up to top of opening.
4. Pre-wire receptacles in closed base fixtures to a junction box installed within 6" from bottom of utility or compressor compartments.
5. Receptacles mounted on Open Base fixtures: installed on 12" x 10½" x 4½" deep 14-gauge stainless steel panel with returned ends and sloping recess. Secure panel to underframe of fixture top.
6. Pre-wire receptacles on open base fixtures to a junction box secured to a leg or mounted on underside of lower shelf. Vertical runs of wiring: made in rigid conduit or within the tubular leg.
7. Receptacles installed in/on-fabricated equipment: Hubbell, Inc. assemblies horizontally-mounted in a metal box with stainless steel cover plate.
8. Switches installed in/on-fabricated equipment: Hubbell, Inc. with metal box and stainless-steel cover plate. Switches: pre-wired to the controlled device and to a junction box installed within 6" from bottom of utility or compressor compartment. All refrigeration system switches: installed within the compressor compartment near the door opening.
9. Load centers installed in/on fabricated equipment to have all fixture components pre-wired to load center with balanced phase loading. Load center: ready for final connection by Division 26 and flush-mounted within utility compartment rear panel, set back 8" from access door. All breaker/device information: typewritten on circuit schedule in load center door (number corresponding breaker/device) with enclosed schematic wiring diagram of fixture components.
10. All receptacles to be pre-wired to cord and plug assembly and routed through overshef post at all island equipment locations, unless specified otherwise.

F. Light Fixtures.

1. Light fixtures with lamps installed in/on fabricated or field-assembled equipment: pre-wired to a junction box for final connection (continuous-run fixtures when indicated).
2. LED Display Light: install light fixtures full-length of Display Stand and Serving Shelf with stud bolts and pre-wire through support posts to an apron-mounted switch.
3. Heat Lamps: installed to underside of serving shelf assemblies. When multiple 24" heat lamps are specified, provide maximum length heat lamp chassis. Install all switches remote from lamps.
4. Cold Storage Light Fixtures: Furnished by Section 11 4000 and installed by Div. 26. All electrical wiring and conduit provided by Div. 26. electrically connected through the Vapor proof light fixture base connection, located on the interior door header. Door frame wiring stubs out top of panels 8" in flexible conduit for final connection by electrical contractor. All horizontal conduit: above ceiling panels. Install plastic sleeve through ceiling panels for electrical conduit. Seal sleeved penetrations airtight at both sides of panel. All penetrations to be sealed by Kitchen Equipment Contractor. All Cold Storage light fixtures to be LED.

G. Final Electrical Connection Provisions.

1. Fabricated equipment containing electrically-operated components or fittings indicated on Utility Connections Drawings: direct-connected, with each component, fitting or group pre-wired to a junction box for final connection by Division 26. Refer to drawings for circuit loading.

2. Fabricated equipment containing electrically-operated components and/or devices indicated: circuit-breaker load center with each component or device pre-wired to a separate circuit breaker for balanced phase loading and single final connection by Division 26.
 3. Field-assembled equipment (e.g., prefabricated cold storage assemblies, exhaust hoods, warewash machines, etc.) shall have electrical components completely interconnected in this Section for final connection arrangements as indicated on Utility Connection Drawings by Division 26.
 4. Pre-wire the following groups of cold storage assembly electrical devices to a top-mounted junction box for final connection by Division 26 per compartment grouping (unless otherwise indicated).
 - b. Light fixtures and switches; heated pressure-relief vent.
 - c. Door/jamb heaters.
 - d. Evaporator fans, defrost elements and drain line heaters.
 2. All electrical final connection points of equipment shall be tagged, indicating:
 - a. Item number.
 - b. Name of devices on circuit.
 - c. Total electrical load.
 - d. Voltage and phase.
- H. Lamps: in all Foodservice Equipment containing light fixtures. Refrigerator or heated cabinets: All exposed LED lamps above or within a food zone: Shat-R-Shield lamps or standard lamps, sleeved with end caps.

2.6 CUSTOM - FABRICATED / ASSEMBLED UNITS

- A. Mechanical or electrical operating components or products integrated into a fabricated fixture: ventilation and service access required or recommended by the manufacturer. The service access panel(s) size and placement is to permit easy lubrication, adjustment or replacement of all moving parts and is to be indicated on fabrication shop drawings.

2.7 BAKER TABLE TOPS (Unless specified otherwise)

- A. 14-gauge 304 S/S top with 2" square turn down at front, 6" high enclosed splash at three (3) sides and rear. Brace same as "Counter/Table tops".
- B. 1¼" x 6" high integral coved riser at rear and ends unless indicated otherwise on drawings.
- C. 16-gauge stainless steel flour-trough at free long sides, secured to underside of top. Trough: 3" diameter with eased edges/corners.

2.8 COUNTER / TABLE TOPS

- A. 14-gauge stainless steel; all free edges turned down 2" with ¾" tight hem at bottom. Free corners: rounded on ¾" radius.
- B. Marine edges: turned up ½" on 45° angle and turned down 2" with ¾" tight hem at bottom.
- C. Cafeteria serving counter tops at hot food stations: full-length x 3½" x ½" high raised rail at (customer's) front side with 45° integral turndown to counter surface.
- D. Tops abutting high fixtures or walls: cove up specified height and slope back 1½" at top on 45° angle; 2½" slope where piping occurs. Turn down 1" at rear of splash and close ends to bottom of top turndown. Secure splash turndown to wall with 4" long 14-gauge stainless steel "Z" clip anchored to wall, 36" o.c.
- E. Freestanding tables and all serving counter splash-risers: turned back on 90° angle with 1" turndown at rear.
- F. Brace tops with rigid-welded 1½" x 1½" x 1/8" galvanized steel angle frame at perimeter with cross bracing 2'-0" o.c. maximum. Provide 4" x 4" x 12-gauge stainless steel triangular pads where leg gusset welds to frame. Paint entire frame with Rustoleum gray semi-gloss enamel. Angle frames: secured to underside of top surfaces with ¼" studs welded 9" o.c. maximum with chrome-plated

washer, lock washer and capnut. Studs: such length that cap nuts can be made-up tight, bringing top down snugly on angle frame eliminating all vibrations or "oil-canning".

- G. Tops: 1½" overhang at free sides of underframe or Closed Base Body.
- H. Mockett Model No. SG5-26 chrome-plated/plastic grommet assembly or integrally-welded stainless-steel flange or inverted gusset where service utilities or support posts penetrate or abut tops, ground and polished to match top. When conditions permit, provide a 1" x 1½" rectangular opening in the backsplash for service utilities in lieu of piercing the horizontal surface. Install stainless steel split-tubing at raw-edge of opening.
- I. Extend underbracing members to wall, turn down 6" and anchor to wall when specified to be mounted on leg/bracket assembly.
- J. All openings in tops: 3/16" high raised die-formed edges.
- K. All top openings for pans or inserts: 20-gauge stainless steel, watertight liners, 8½" deep, secured to underside of counter top.
- L. All "built-in" and "drop-in" counter equipment/appliances: with framing members at perimeter of opening.
- M. Scrap Container: 18-gauge stainless steel construction 6½" x 6½" x 21¾" long. Top of container: 5/8" wide x ¼" high full perimeter flange with ¼" diameter stainless steel rod bail handle. Interior vertical corners coved on ½" radius. Counter top: fitted with 6¾" square die-stamped opening.

2.9 COLD PANS

- A. 14-gauge stainless steel with ¾" coved interior welded integrally to counter top with 3/16" raised edge at perimeter of opening. Depth of Cold Pan: NSF 7 compliance.
- B. Slope bottom to required quantity of Component Hardware Model No. E16-4021 drain fittings at 48" o.c. maximum. Sleeve through insulation at drain fittings and extend common drain line into utility compartment for indirect waste connection.
- C. ½" o.d. copper refrigerant lines in serpentine pattern, 1½" o.c. flattened for maximum contact. Secure tubing to underside of ¼" thick aluminum "distribution plate" installed tight to underside of frost plate area and apply cold-conductive mastic to all surfaces.
- D. Component Hardware Model No. E16-4021 drain fittings at 48" o.c. maximum, sleeved through insulation with common drain line extended into utility compartment.
- E. Heat Cable: low-wattage, full-perimeter, below counter top at edge of depression. Secure with "Z" clips, 9" o.c. and interwire with compressor switch for simultaneous operation.
- F. Enclose sides and bottom of pans with airtight 18-gauge galvanized jacket and pack with 2" fiberglass insulation set in mastic.
- G. Compressor: size as indicated or required to accommodate size of cold pan. Locate compressor in compressor compartment below unit or as indicated on drawings.
- H. Sectional 16-gauge stainless steel perforated false bottom (¼" holes, @ ¾" o.c.). Turn down 1½" all sides, weld corners and provide finger rings. False bottom sections: 24" long maximum.

2.10 DRAWERS

- A. Liners: Component Hardware Model No. S81-2020C (20" x 20") S/S liner, easily removable with drawer in fully extended position.
- B. Drawer Frame: 16-gauge stainless steel flanged out at top. Weld the frame to double-paneled 16-gauge stainless steel drawer front with full-length recessed pull at top (similar profile as Garco Model No. R-1060) with closed ends.

- C. Channel-formed horizontal pull: $\frac{3}{4}$ " turndown at front and ends with $\frac{1}{2}$ " tight hem. Front edge of pull: flush with face of drawer. Recess behind pull: sloped up on 60° angle, terminating 1" below bottom edge of pull.
- D. Mount drawer frame on Component Hardware Model No. S52-2020 self-closing slides, with Delrin bearings, full-depth of fixture. Secure slides to body or brackets to eliminate lateral movement in extended position. Refrigerator drawers: Component Hardware Model No. S52-2024 stainless steel slides with Delrin bearings.
- E. Drawer enclosure in an Open Base Fixture: 18-gauge stainless steel flanged out at top for attachment to underside of table top. Lower edge of enclosure is flanged in toward open bottom. Mount drawer slides to enclosure and brace as required. Face of enclosure is to be same length and height of drawer face. Provide $\frac{3}{4}$ " deep offset in front of enclosure and $2\frac{1}{2}$ " from underside of table top for flush-fitting appearance. Drawer enclosure on freestanding fixture: full-depth of table framing.
- F. Drawer enclosure in a Closed Base Fixture: completely partitioned from adjoining area. Drawer front: flush-fitting with face of body.
- G. Drawer Liners other than tool/utility: Bread Drawer: S/S drawer liners sized to fit drawer; Refrigerated Drawer: S/S drawer liners sized to fit drawer.
- H. Cash Drawer: integral stainless steel body, 3" deep.

2.11 FOOD WELLS (UNLESS SPECIFIED OTHERWISE)

- A. Food Warmer Controls: remote-mounted in sloping recessed apron panel. Control panel is recessed $2\frac{1}{2}$ " from bodyline at top of 60° slope, 1" at lower edge. Terminate slope angle $2\frac{1}{2}$ " below counter top. Mount panel on concealed piano hinge at bottom edge; secure with screws at upper corners.
- B. Manifold all warmer drains and extend to within utility compartment for indirect waste connection. Install valve in drain line and extend handle through compartment door.
- C. Removable 18-gauge stainless steel closure panel at underside of warmers.
- D. 14-gauge stainless steel plate/utensil shelf full-length of hot food station unless noted otherwise: 10" below counter top x 9" deep, with rear panel coved up to underside of counter top; end panels turned up square. Front of shelf: turned down $1\frac{1}{2}$ " and returned under for closure panel attachment.
- E. Food wells: Hatco Model No. HWBIBRT-FULD insulated food warmer (1200 watts, 208 volts, single phase) secured to underside of 12" x 20" die-stamped counter top openings with thermal breaker mastic rope applied at perimeter of food well flange.
- F. F. Soup Warmers: Hatco Model No. HWB-11QTD soup warmer secured to underside of 11" diameter die stamped counter top opening with thermal breaker mastic rope applied at perimeter of soup well flange. Maximum allowable temperature of counter top at contact surface: 120°F. Each warmer: equipped with one 11-quart stainless steel round insert and slotted cover.
- G. When specified: $\frac{5}{8}$ " deep recess in counter top full-length of pan-opening or as shown, with equal-length removable $\frac{3}{4}$ " thick Read Products "Richlite" cutting board sections, 42" long maximum. Recess and board: spaced 2" from front edge of pan opening and extended to leading edge of counter top.

2.12 SINKS

- A. 14-gauge stainless steel; all interior corners (horizontal/vertical) coved on $\frac{3}{4}$ " radius. $1\frac{1}{2}$ " wide double-walled partitions with flat tops between compartments.
- B. Continuous exterior panels of multiple-compartment sinks: 14-gauge stainless steel filler panel welded, ground and polished between compartments.

- C. Sinks (with overflow): score and slope sink bottom $\frac{1}{2}$ " to die-stamped opening fitted with Fisher 22306 twist waste valve $3\frac{1}{2}$ " x 2" with overflow and tailpiece. 14-gauge stainless steel bracket: welded to sink bottom for drain stem with $1\frac{1}{2}$ " handle clearance.
- D. Where sinks are installed in fixture with Closed Base Body, provide a Fisher 22306 twist waste valve $3\frac{1}{2}$ " x 2" with overflow and tailpiece. (Sinks with dimension larger than 20" x 20" in Closed Base Body will not have overflow fitting.) 14-gauge stainless steel bracket: welded to sink bottom with T & S Model No. BL-4740-1 guide bushing. Install on shortened drain stem, one T & S Model No. BL-4710-1 remote control stem assembly only (length as required) with Model No. 113-L universal joint and white blank button. Set drain control handle in Cambro Model PSB-6 bowl with bottom omitted (dress raw edge) to permit passage of drain handle. Secure bowl in utility compartment door or body panel with clear silicone.
- E. When single-hole deck-mounted faucets are specified, install overflow fitting in sidewall of sink compartment and provide ell-fitting in connecting tubing.
- F. Flush Covers when specified: $\frac{1}{2}$ " thick Read Products, Inc. "Richlite" cutting board, size as indicated. Support clips: $\frac{1}{4}$ " stainless steel rod 2" long, formed at 45° with two $\frac{3}{4}$ " leg ends ($\frac{1}{4}$ " long threaded ends). Insert rod-clips through tight-clearance holes in sink, seal watertight and secure with stainless steel acorn-nuts or tack-weld at exterior of sink wall. Set support clips $\frac{1}{2}$ " below top. Provide 14-gauge stainless steel channel or angle support frame to store covers when not in use. Cover holder: adjacent to sink compartment, below counter top or under drawer assembly.

2.13 TRAYSLIDES (UNLESS OTHERWISE SPECIFIED)

- A. Trayslides: 12" wide, solid 16-gauge stainless steel turned up 2" at rear behind counter top turndown; turned down 4" at front and free ends, unless otherwise indicated.
- B. Three $\frac{1}{4}$ " high die-formed inverted "vee" ridges at 4" o.c., 2" from leading edge, terminating 2" from ends of trayslide with tapered ridge-ends.
- C. Ridges formed on radius: equal-length segments with 2" separation between chords.
- D. Secure trayslides to counter-top/body frame, same as "Counter Tops." Enclose exposed underside of trayslide with 18-gauge stainless steel.
- E. When indicated, project trayslides 2" beyond serving counter top and return the full-width of serving counter at free ends.
- F. All trayslides to be provided and mounted per ADA requirements.

2.14 DISHTABLES

- A. Soiled/clean dishtable: 14-gauge stainless steel; free edges coved up 3" with $1\frac{1}{2}$ " diameter rolled rim and bullnosed corners.
- B. Edge of dishtables next to high fixtures or walls: coved up 10" and sloped back $1\frac{1}{2}$ " on 45° angle; $2\frac{1}{2}$ " slope where piping occurs. Turn down 1" at rear of splash and secure to wall with 4" long 14-gauge stainless steel "Z" clips anchored to wall, @ 36" o.c.
- C. Exposed rear splash: 16-gauge stainless steel finish panel from top of splash to bottom edge of rolled rim with welded vertical joint at end. Secure panel with concealed attachment and install bracing 24" o.c.
- D. Cove all interior corners (horizontal/vertical) on $\frac{3}{4}$ " radius and slope tables $\frac{1}{8}$ " per foot to sinks, scuppers or warewash machines, maintaining level crown/splash.
- E. Brace dishtables with 1" x 4" 12-gauge stainless steel channels down centerline of top and between each pair of legs, with closed ends. Bracing: secured to underside of dishtable with $\frac{1}{4}$ " studs welded 6" o.c. maximum, with chrome-plated washer, lock washer and cap nut. Studs: such length that the

cap nuts can be made up tight, bringing the dishtable down on the channel-members, eliminating all vibration and "oil-canning."

- F. Integrally-welded stainless steel flange or inverted gusset where service utilities or support posts penetrate or abut tops; ground and polished to match top.
- G. Hose Bibb: Chicago Model No. 305VBRCF; mounted on 12-gauge stainless steel flange or inverted gusset bracket with 3/8" stainless steel rod hose hanger.
- H. Extend underbracing members to wall, turn down 6" and anchor to wall when specified to be mounted on leg/bracket assembly.
- I. Paper-Drop Opening: 9" square with 4" integral chute having hemmed bottom edge. Slope dishtable top 1" toward opening, forming a 16" square tapered deposit point.
- J. Accessible Tray-Drop Opening: 10" x 18" with integral 16-gauge stainless steel seamless chute sloped on 45° angle toward center of mobile soak sink position.

2.15 DISH / TRAY DEPOSIT ASSEMBLY

- A. 14-gauge stainless steel deposit shelf, size as indicated. Extend shelf through opening, flush with public side of partition, height as required by local code authorities. Turn shelf down 1" at front with 3/4" return at bottom (either scribed into partition or forming reveal). Shelf: 1" square turndown at rear long side, integral with conveyor slider pan, tray-accumulator or dishtable. Extend rear/end splash to align with head of deposit station opening. Modify rolled rim at the operator's side of the tray drop window to have a 3" rolled rim.
- B. 18-gauge stainless steel window frame with perimeter flange channel-formed 1" x 3/4" at both sides of wall. Weld all corners of frame and install with concealed attachment. Align/abut one jamb of frame with end splash of conveyor slider pan or dishtable whenever adjacent.

2.16 UTENSIL - WASH COUNTERS

- A. 14-gauge stainless steel; all free edges coved up 3" with 1 1/2" diameter rolled rim and bullnosed corners.
- B. Edges of utensil-wash counters next to high fixtures or walls: coved up 10" and sloped back 1 1/2" on 45° angle; 2 1/2" slope where piping occurs. Turn down 1" at rear of splash and secure back splash to wall with 4" long 14-gauge stainless steel "Z" clip anchored to wall @ 36" o.c. Vacuum breaker pockets: 4" long square turnback sections, aligned with slope breakline.
- C. Exposed Rear Splash: 16-gauge stainless steel finished panel from top of splash to bottom edge of rolled rim with welded vertical joint at end of splash and 1/2" turnback at bottom of panel. Secure panel with concealed attachment and install bracing 24" o.c.
- D. Cove all interior corners (horizontal/vertical) on 3/4" radius and slope tables 1/8" per foot, maintaining level crown.
- E. Brace utensil-wash counters with 1" x 4" 12-gauge stainless steel channels down centerline of top and between each pair of legs, with closed ends. Bracing: secured to underside of dishtable with 1/4" studs welded 6" o.c. maximum, with chrome-plated washer, lock washer and cap nut. Studs: such length that the cap nuts can be made up tight, bringing the dishtable down on the channel-members, eliminating all vibration and "oil-canning."
- F. Integrally welded stainless steel flange or inverted gusset where service utilities or support posts penetrate or abut tops: ground and polished to match top.
- G. Extend underbracing members to wall, turn down 6" and anchor to wall when specified to be mounted on a leg/bracket assembly.

- H. Hose Bibb: Chicago Model No. 305VBRCF; mounted on 12-gauge stainless steel flange or inverted gusset bracket with 3/8" stainless steel rod hose-hanger.

2.17 DOORS

- A. 18-gauge x 1" stainless steel double pan-formed welded construction, insulated with 1" thick polyurethane boards. Seal perimeter joint of pans. Offset lower horizontal framing member of Closed Base Body to align flush access door with bottom of Body.
- B. Channel-formed full-length horizontal recessed pull: 3/4" turndown at front and ends with 1/2" tight hem. Front edge of pull: flush with face of door. Recess behind pull: sloped up on 60o angle and terminated 1" below bottom edge of pull.
- C. Door Hardware:
1. Two Component Hardware Model No. M75-1002 stainless steel hinges (notch door/jamb at hinge location).
 2. Component Hardware Model No. 35-2000 concealed Magnetic Catch.
 3. Component Hardware Model No. D30-4780 lock in upper free corner of door.
- D. Louvered opening: cutout opening size as indicated, turn in 1" and weld. All corners: ground and polished.
1. Full-height 18-gauge stainless steel louver with 1" vanes at 45°, 1/2" spacing. Perimeter channel-formed frame: 1 1/2" x 1".
 2. 45° x 1" x 1/2" x opening width plus 1/2" 18-gauge stainless steel louver.
 3. Tack weld tab of louver flange to back panel of door.
- E. Drain handle opening: 6" diameter hole through double pan to accommodate Cambro Model No. PSB-6 Bowl.
1. Secure bowl to door panel with clear silicone.
 2. Omit bottom of bowl. Dress raw edges of opening for passage of drain handle.
 3. Exposed insulation at penetration of door pan: painted black.
- F. Sliding Doors: fabricate same as Paragraph "A."
1. Aluminum Sliding Door Track: Component Hardware Model No. B57-0000 Series, length as required. Secure to angle frame at top of underside.
 2. Front/rear door sheaves: stainless steel 3/4" side mounted door hangers; two (2) required per door.
 4. Recessed Vertical Pull at Upper Corner of Door: Component Hardware Model No. P63-1012.
 5. By-Passing Door Guides secured to bottom shelf: Component Hardware Model No. B62-1093.
 6. Door Stop at bottom edge of door: Component Hardware Model No. B60-1086.
- G. Offset lower horizontal framing member of Closed Base Body/utility compressor compartment to align door flush with bottom of Body.

2.18 CLOSED BASE BODIES

- A. Frame: rigid-welded 1 1/2" x 1 1/2" x 1/8" galvanized steel angle forming a continuous structure around the top and bottom perimeters of the fixture, a post at each corner, studs spaced 48" o.c. maximum. Top of frame is cross-braced with 1 1/2" angles, 2'-0" o.c. maximum.
- B. 18-gauge stainless steel panels and trim with concealed attachment. All seams: welded, ground and polished.
- C. Exposed Vertical Corners: rounded on 3/4" radius. Closed Base Bodies adjacent to walls or fixtures: square corners.
- D. Vertical and horizontal channel members at shelf interior or drawer enclosures, such as corners and center mullions: closed and sealed

- E. Closed Base Bodies set on finished masonry platforms: closed and caulked at underside of equipment overhang and bolted to platform. Body overhang of platform: 1" at free ends 2" at front and exposed rear sides.
- F. Closed Base Bodies not set on platform: Component Hardware Model No. A54-2-6, 6" legs spaced 5'-0" o.c. maximum.

2.19 COMPRESSOR COMPARTMENTS

- A. Same material as Closed Base Bodies with back and end partitions; omit bottoms only.
- B. 10-gauge steel slide out support: channel frame on full extension slides with 125 lb. minimum capacity secured to fixture frame with anti-vibration mountings for maximum sound deadening. Closed Base Body on solid platform: front-to-back slide out support channels set 4" above bottom for air circulation.
- C. Access Door: 18-gauge stainless steel double-pan type with channel formed horizontal recessed pull full length of top (similar profile as Garcy Model No. R-1060) with closed ends. Channel-formed horizontal pull: $\frac{3}{4}$ " turn down at front and face of door. Recess behind pull slopes up on 60° angle, terminating 1" below bottom edge of pull. Offset lower horizontal framing member of Closed Base Body to align flush access door with bottom of body. Door hardware: two Component Hardware Model No. M75-1002 stainless steel hinges (notch door/jamb at hinge locations) and Component Hardware Model No. 35-2000 concealed magnetic catch.
- D. Access Doors Louver: full-height, with $1\frac{1}{2}$ " x 1" x 18-gauge stainless steel channel-formed frame with welded corners. 18-gauge stainless steel louver. Submit sample of design for approval.

2.20 UTILITY COMPARTMENTS

- A. Closed Base Bodies or Pedestal Supports: fitted with utility compartments wherever piping or wiring is required in/on the fixture.
- B. Same material as Closed Base Bodies with full-height back and end partitions. Omit bottoms except at hose-reel locations.
- C. Access Doors: 18-gauge stainless steel double-pan type with channel formed horizontal recessed pull full-length of top (similar profile to Garcy Model No. R-1060) with closed ends. Channel-formed horizontal pull: $\frac{3}{4}$ " turn down at front of door, recess behind pull slopes up on 60° angle, terminating 1" below bottom edge of pull. Offset the lower horizontal framing member of the Closed Base Fixture to permit flush alignment of door with face and bottom edge of body. Door hardware: two Component Hardware Model No. M75-1002 stainless steel hinges (notch door/jamb at hinge locations) and one Component Hardware Model No. 35-2000 concealed magnetic catch.
- D. No shelves of Closed Base Fixtures are to be penetrated.

2.21 UTENSIL RACKS

- A. Rack: $\frac{1}{4}$ " x 2" 300 series stainless steel flat bar with No. 4 finish, fully welded and formed to match shape shown on drawings. Lowest band: 7-6 aff, unless otherwise indicated.
- B. Ceiling Mount Supports: 1-5/8" diameter 16-gauge stainless steel tubing from band to 18" above ceiling. Anti-sway bracing above ceiling: $1\frac{1}{2}$ " unistrut members. Tubing penetrations at ceiling: Component Hardware Model No. A16-0206 stainless steel gussets.
- C. Table Mount Supports: 1-5/8" diameter 16-gauge stainless steel tubing extended thru counter top. Secure to closed base framing or crossrail/undershelf on open base fixture. Tubing penetrations of counter tops: integrally welded stainless steel inverted gusset.
- D. Utensil Rack Hooks: Component Hardware Model No. J77-4401 stainless steel hooks spaced 8" o.c. maximum.
- E. Electrical Receptacle: NEMA No. 5-20-R or as noted. Mount in fully welded $3\frac{1}{2}$ " x $5\frac{1}{2}$ " x 3" 14-gauge stainless steel enclosure with $\frac{1}{2}$ " radius corners. Stainless steel cover plate to fit specified receptacle. Pre-wire thru tubular support for final connection above ceiling by Division 26.

2.22 CASHIER / SERVING COUNTERS

- A. Exterior Body Panels when specified: $\frac{3}{4}$ " thick marine grade hardwood plywood with plastic laminate or solid polymer in Architect's selection of color/pattern at all exposed surfaces; backing sheet where concealed.
- B. Position, size and finish horizontal or vertical reveal as directed by Architect.
- C. Secure panels to counter body framing in concealed manner. Install removable panels with "Z" clips overlapping body framing members.
- D. Hinged doors in exterior body panel(s): Grass Model No. 1200VZ or 1200VZ8 self-closing hinges. Three (3) required per door; Grass Model No. G/HRZ base plate at each hinge; Ives Model No. TM820 concealed push latch at each door. Confirm Model No. and provide samples with submittal.
- F. Cashier counter to have 16-gauge s/s intermediate shelf, turned down 1 $\frac{1}{2}$ " with tight hem at front. Cove up 2" at rear and sides. Brace undershelf with 1" x 4" 14-gauge stainless steel channel at longitudinal centerline. Provide outlet for power/data within body located above intermediate shelf. Provide cash drawer inserts per district standards.

2.23 OPEN BASE STRUCTURES

- A. 1-5/8" o.d. x 16-gauge seamless stainless-steel tubing legs beveled at bottom. $1\frac{1}{4}$ " o.d. crossrails fully-welded (360o smooth and polished) to legs at 10" aff, o.c.
- B. Top of Leg: inserted in Component Hardware Model No. A20-0206 gusset fully-welded to table frame or sink bottom.
- C. Bullet Foot: Component Hardware Model No. A10-0851.
- D. Freestanding fixtures requiring utility connections: Component Hardware Model No. A10-0854 flanged feet at the fixture corners, anchored to floor with non-corrosive bolts.
- E. Table Bases: maximum leg spacing of 6'-0" o.c.; dishtable and utensil wash counter bases at 5'-0" o.c.
- G. Open Base equipment specified to be supported by brackets at the rear side only (not completely cantilevered): tubular legs at front side only with Component Hardware Model No. A10-0854 flanged feet anchored to floor with non-corrosive bolts. Front-to-back crossrail: fitted into Component Hardware Model No. A20-0406 circular gusset secured to wall with non-corrosive bolts.

2.24 UNDERSHELVES

- A. Open Base Structures: 16-gauge stainless steel turned down $1\frac{1}{2}$ " with tight hem at bottom. Notch all corners to fit tubular legs and weld from underside to completely fill gap; grind and polish. Cove up 2" at rear or ends adjacent to wall, columns, refrigerators, etc. The turn up at freestanding fixtures is to be hemmed tight to bottom of turndown. Brace undershelf with 1" x 4" 14-gauge stainless steel channel at longitudinal centerline and at each intermediate pair of legs.
- B. Open Base Structure specified to be supported by brackets at rear side only (not completely cantilevered): 16-gauge stainless steel turned down $1\frac{1}{2}$ " at free sides with tight hem at bottom edge. Notch all corners to fit tubular legs as required and weld from underside to completely fill gap; grind and polish. Cove up 2" at rear ends, as indicated. Fill gap at front to back rail, grind and polish. Brace undershelf with 1" x 4" x 1" 14-gauge stainless steel channel at longitudinal centerline between front to back rails.
- C. Closed Base Fixtures: 16-gauge stainless steel turned down $1\frac{1}{2}$ " at front. Front edge of bottom shelf: turned back and sealed to finished masonry platform or boxed for leg application. Center shelf has $\frac{3}{4}$ " tight hem.
 - 1. Shelves: turn up square at ends (coved up at rear only) to the shelf above or counter top flanged out for attachment with no open spaces at interior.
 - 2. All shelf partitions at exposed ends of cabinet bodies or interiors: free of exposed framing members.

3. Reinforce shelves with full-length 1" x 4" x 14-gauge stainless steel closed hat channel.
4. Unless otherwise noted, all closed base undershelves are to be 22" deep, clear.
5. Fully weld smooth and polish, the vertical seam of shelf turndown/turn up with face of body partition.
6. Seal the vertical seam of square turn-in at exposed interior of open shelf sections.

2.25 ANCHOR PLATES / WOOD GROUNDS

- A. Behind finish surface wherever building wall, partitions or ceiling construction will not accommodate direct attachment of equipment such as overshelves, wall cabinets, hose reels, utensil racks, exhaust hoods, display cases, etc. Material and installation by General Contractor. Location and coordination with trades by Section 11 4000.
- B. Anchor Plates: not less than 12" x 12" x 1/4" thick steel, secured to the structure above or behind the finished surface, positioned at attachment points.
- D. Wood Grounds: length required by fixture, component or device, 24" wide x 3/4" thick plywood secured to partition system prior to gypsum board installation.
- E. Above ceiling supports: structural shapes (4" x 8.0 lb. channel) suspended from structure. Maximum height 15'-0" aff. size: width of equipment x length of equipment plus 6'-0". Cross bracing at 6'-0" on center maximum.

2.26 OVERSHELVES

- A. 16-gauge stainless steel with free edges turned down 1" with 1/2" tight hem at bottom. 3/4" radius at free corners.
- B. Turn up 2" raw at walls and sides with horizontal coved corner at rear. Round front corners of turn up on 3/4" radius.
- C. Where shelf width exceeds 12" width, reinforce with 1/2" x 4" x 14-gauge stainless steel closed hat channel full-length of shelf.
- D. Wall-Mounted Shelves: 16-gauge stainless steel brackets 48" o.c. maximum, set in 6" from ends.
- E. Freestanding Shelves: where splash is required at free overshelves, turn up square 2" at ends, cove up at rear and hem tight to lower edge of front turndown. Weld exposed corners.
 1. Freestanding overshelves: 16-gauge stainless steel cantilevered brackets at rear of table; double-cantilevered brackets at center of table. Posts for cantilevered overshelves are 1-5/8" o.d. x 16-gauge stainless steel secured to underframe, 4'-0" o.c. Ends of shelves: secured to adjacent wall/fixture or mounted on 1/4" diameter stainless steel posts.
 2. Freestanding overshelves not on cantilevered brackets: 1 1/4" o.d. x 16-gauge stainless steel posts, each pair at 4'-0" o.c., maximum.
- F. Baker Table Overshelves: supported at 18" above top with 1 1/4" o.d. stainless steel tubular supports with channel shoe secured to risers.
- G. Glass/Cup Rack Overshelf at Dishtables: 14-gauge stainless steel with 1 1/2" deep "vee" trough at free long sides with 1" tight hem at inside of trough. Provide a 1/2" marine edge at free ends; 4" splash at wall. Suspend shelf at 18" above dishtable surface on posts/brackets anchored to dishtable frame/wall at rear; 1" o.d. stainless steel tubing supports from structure above ceiling at front edge, 60" o.c./each end.
 1. Install at both ends, 1/2" stainless steel drain-tube (connecting both vee-troughs) extended to dishtable surface through splash turnback.
 2. Rack-rest: horizontal full-length 1-5/8" o.d. stainless steel tubing supported at 10" o.c. above shelf (8" o.c. for double service shelf) by 1 1/4" o.d. stainless steel tubing with closed ends. Support tubing: welded, ground and polished, spaced 60" o.c.

3. Rack-rest supports to wall: 4" x 4" x 10-gauge stainless steel flange plates welded to support tubing. Anchor flanged plates to blocking ground with non-corrosive bolts.

2.27 DRAIN TRENCH LINER / GRATING

- A. Liners: 14-gauge stainless steel in sizes as indicated.
- B. Interior of liners: 6" deep with all interior corners (horizontal/vertical) coved on $\frac{3}{4}$ " radius; sloped and scored 1" to integrally welded Component Hardware Model No. D34-Y011 basket drain assemblies @ 48" o.c., fitted with 6" long welded tailpiece. Stainless steel safety chain: connected to basket strainer assembly and top of liner wall.
- C. Liners: 1" wide perimeter shoulder at the top, turned up flush with finished floor, tight-hemmed back down to the shoulder level and flanged out 2" for attachment to the slab.
- D. Underside of sloping portion of liner: 2" long "Z" clips.
- F. Grating: IMC-TEDDY PFG-ADA removable fiberglass grating.
 1. 1" deep "I" bearing bars with 0.6" wide top flange.
 2. Full perimeter frame, section quantities and sizes indicated.
 3. Maximum of 2'-0" sections.
 4. Grating bars to be spaced 0.4" apart per ADA requirements.
 5. Grating to be two (2) equal sizes.

2.28 WALL PANELS

- A. Wall Panels: 18-gauge stainless steel, double pan-formed $\frac{1}{2}$ " thick with internal stiffener members. Fill with USDA approved thermal insulation, full height and width of panels, attach to interior with mastic. Maximum allowable temperature at rear side of panel: 120oF.
 - 1. Height of panels as required: top of tile base to underside of hood, top of tile base to top cap of stub wall or top of splash to underside of hood.
 - 2. Level and square lower edge and sides.
 - 3. Butt joint all panels.

2.29 EXHAUST HOOD (Surface - Mounted Condensate)

- A. Hoods: size/shape as indicated: 18" high at interior.
- B. Body: 16-gauge stainless steel, with all seams welded, ground and polished.
- C. Continuous condensate trough at perimeter: 3" x 1".
- D. Frame top of hood with $1\frac{1}{2}$ " angle iron assembly and suspend from structure above ceiling by $\frac{1}{2}$ " diameter steel rods, drawn tight against finished ceiling surface.
- E. Duct opening/collar as specified with stainless steel louvered grille over opening.
- G. Div. 22 to extend drain line to floor sink. Drain line to be silver painted.
- H. $\frac{1}{2}$ " diameter steel hanger rods at 4'-0" O.C. maximum to be by Kitchen Equipment Supplier, but they are to be anchored to supporting structure (or slab) by the General Contractor in the locations required by exhaust hood shop detail.

2.30 EXHAUST HOOD (UNLESS SPECIFIED OTHERWISE)

- A. Exhaust to be provided to meet local jurisdiction code requirements. Kitchen Equipment Contractor to verify code requirements and coordinate with Division 23 and 26. Hoods over production equipment to be Type 1 with continuous capture. All Type 1 hoods to be 6' deep to ensure smoke/steam capture unless notated otherwise
- B. Install fire suppression system(s) in all ventilators, specified in this section. Install in accordance with manufacturer's recommendations and applicable codes or standards. Submit installation certification form to Architect.
- C. Locate chemical cylinders as indicated on drawings and install piping to exhaust hood(s) in totally-concealed manner. Set cylinders and cabinets at 7'-0" clear AFF unless noted otherwise. Provide polished chrome plated tubing piping/fittings, where exposed at cylinder location and at interior of exhaust ventilator. Exposed pipe threads in/above food zone not allowed. Submit schematic diagram of installation and confirm critical distances from cylinders to nozzles.
- D. Remote manual release located in path of egress from protected exhaust hood area. Kitchen Equipment Contractor to coordinate location with local Fire Marshal requirements prior to submittal review. All conduits to be recessed within wall, SURFACE MOUNTING WILL NOT BE ACCEPTED.
- E. Provide one (1) handheld Type 'K' 6-liter fire extinguisher per Ansul system, surface wall mounted.
- F. Required quantity and sizes of mechanically-operated gas valves.
- G. Confirm interconnection of all equipment as required to ensure exhaust hood and fire suppression systems are completely operational and meet local jurisdiction code requirements.
- H. $\frac{1}{2}$ " diameter steel hanger rods at 4'-0" O.C. maximum to be by Kitchen Equipment Supplier, but they are to be anchored to supporting structure (or slab) by the General Contractor in the locations required by exhaust hood shop detail.

- I. Provide appropriate quantity of fire suppression systems as required by local jurisdiction code requirements.

2.31 HIGHLIGHTING

- A. Polish the following vertical surfaces to a No. 8 finish:
 - 1. Serving and display shelf turndowns.
 - 2. Conveyor and dish/tray deposit station turndowns/frame.
 - 3. Trayslide turndowns.

2.32 SHOP / FIELD JOINTS

- A. Field joints: least possible number, used only when equipment size must be limited for access into building or interior space.
- B. Stainless steel tops (including edges and splashes): fully welded, ground and polished to match adjacent surface.
- C. Vertical field joints of fixture backsplashes that are inaccessible from the back: terminate 1" above the horizontal coved corner. The remaining height of field joint: hairline butt joint with offset draw-angle behind. All horizontal/vertical draw-joints: located and noted on shop drawings.
- D. Hairline butt joint: 1½" x 1½" x 1/8" steel angles welded to back/underside of counter top/shelf. Offset angle beyond joining metal edge ½" (min.) to provide flat backing surface for joint with angle of other joining metal edge, set for ½" space between vertical legs of angles. Bolt sections together with 5/16" machine bolts, lock washers, acorn head cap nuts, set 3" o.c.
- E. Closed Base Bodies: draw-type with hairline seam fully field-welded.
- F. Millwork: plastic laminated material joints shall be doweled, glued and draw-bolted with fasteners.
- G. Solid Polymer: surfaces drawn tight, filled, sanded and finished to match adjacent surface.

2.33 PREFABRICATED COLD STORAGE ASSEMBLIES

- A. Assembly to be installed by Factory Authorized Installers only.
- B. KEC to provide a 1-year walk-in panel installation warranty. Panel installation warranty to cover labor and part replacement issues resulting from a failure to adequately complete the following during installation:
 - 1. Walk-in panels to be installed in a square, plumb and level manner.
 - 2. Ceiling panels to be installed flush and tight to wall panels with the gasket material undamaged and to create a proper seal. Any signs of condensation at joints or walk-in walls should be reported to FDP and addressed immediately. Caulk at panel seams will not be an acceptable solution.
 - 3. All cam-locks should be engaged and button holes in place.
 - 4. Any gaps under floor angle (due to shimming) must be sealed completely to the slab.
 - 5. All penetrations in ceiling or wall panels should be insulated and sealed.
 - 6. Proper installation of the door systems should allow for the door to self-close and seal around the perimeter of the door opening and at the floor threshold.
 - 7. Final operation of the IC/IC+ control, door heaters and light switches should be confirmed upon completion of the electrical connections.
 - 8. Service issues, resulting from faulty installation will be covered under the walk-in panel installation warranty.
- C. KEC is responsible for overall install accuracy/quality and quality control of work performed regardless of installer or any field modifications due to building/construction conditions. KEC to provide Letter of Install Approval to FDP upon completed install verifying that all items above have

been inspected by the KEC for completeness. This letter will be required as part of the completion of the contract.

- D. Sectional Assemblies: size/shape indicated on drawings; 9'-6" interior clearance unless otherwise specified. Door locations/size: exactly as shown.
- E. Sandwich Panel Insulation: Class 1 Urethane with a vapor barrier, 4" thickness (unless specified otherwise) with mature "U" factor of .030 or lower. Finished panels shall be UL-listed and demonstrate a flame spread rating of 20 or less. Panels must meet performance standards as outlined in U.S. Government legislation.
- F. Wherever compartment dimension exceeds clear-span ability of ceiling panels, provide I-beam support on exterior of ceiling or spline-hangers. Install ½" diameter steel rods through beam/hangers and secure to structure above. Beams or posts within compartments are not acceptable.
- G. Reinforce prefabricated wall panels to rigidly support the door assemblies. The perimeter of the door and frame shall be built of a fiberglass reinforced polymer (FRP) pultrusion. All pultrusions shall be non-conductive, non-corrosive, rust proof and NSF listed. All doors shall be furnished with a replaceable aluminum braided heater wire, electronically monitored, and controlled as to initiation temperature, termination temperature and percentage of operation time as required. Install 2" x 4" 16-gauge stainless steel hat-channel full-width of the jamb with 1/8" stainless steel removable flush sill, secured with stainless steel screws and sealed watertight to channel.
- H. Reinforcement as required to be provided above Freezer door (exterior) and panel next to door (handle side – interior) for mounting of Emergency Strobe Beacon, Push Button Panic Alarm and Release Knob. Emergency Strobe Beacons are by Division 26.
- I. Provide aluminum cove base at interior and exterior of exposed panels for all floor assemblies.
- J. Floor Installations:
 - 1. 4" Recessed Exposed Factory Floor Installation (if required):
 - a. Six mil polyethylene sheets in slab recess with all joints lapped 6 inches and sealed to form a watertight seal.
 - b. Level and square prefabricated perimeter and partition wall panels anchored to slab recess. Protect the exposed surface of panels.
 - c. 4" commercial grade manufacturer's dura floor with diamond treadplate surface and marine grade plywood subfloor.
 - d. 15# felt slip sheet over insulation with 6" lapped joints flashed up the height of the finished floor base.
 - e. 1/2" sand leveling bed by G.C.
 - 2. 8-1/2" Recessed Floor Installation (if required):
 - a. Six mil polyethylene sheets in slab recess with all joints lapped 6 inches and sealed to form a watertight seal.
 - b. Level and square prefabricated perimeter and partition wall panels anchored to slab recess. Protect the exposed surface of panels.
 - c. 4" manufacturer's floor.
 - d. 15# felt slip sheet over insulation with 6" lapped joints flashed up the height of the finished floor base.
 - e. 1/2" sand leveling bed by G.C.
 - f. Concrete flooring and tile over insulation by Divisions 03/09.
 - 3. 12" Recessed Floor Installation (if required):
 - a. Six mil polyethylene sheets in slab recess with all joints lapped 6 inches and sealed to form a watertight seal.

- b. Level and square prefabricated perimeter and partition wall panels anchored to slab recess. Protect the exposed surface of panels.
 - c. 4" manufacturer's floor.
 - d. 15# felt slip sheet over insulation with 6" lapped joints flashed up the height of the finished floor base.
 - e. 1/2" sand leveling bed by G.C.
 - f. Concrete flooring over insulation by Division 03:
 - i. Concrete mix: 5000 psi @ Freezers and 3000 psi @ Coolers.
 - ii. No limestone or fly ash; fiberglass reinforced.
 - iii. #3 rebar, set on 12" centers in both directions.
 - iv. Center rebar vertically in wearing bed.
 - v. 10" high concrete 45° angled wall curb at interior perimeter per food service details.
 - g. Diamond treadplate wall panels on the interior and exposed exterior by 11 40 00. Refer to drawings for height. Coordinate diamond treadplate wall covering at the interior with angled wall curb.
 - h. Ventilation Pipe Requirements by G.C.:
 - i. Bottom perforated vent pipes to be #40 PVC on six ft. max centers open on both ends with the thermostatically controlled fan on (1) end and perforated mesh on the opposite end of the fan at the exterior of the building.
 - ii. Vent pipes to turn parallel with exterior wall - 180° turn down.
 - iii. Vent pipe openings to be held at 24" above grade or roof per design.
 - iv. Fans to be Grainger Manufacturer and sized per airflow needs. Airflow is to be sized based on the length and number of bends.
 - v. If no exterior wall is adjacent, vent pipes will route up and extend past the roof. Roof penetrations by Division 07.
4. Surface Mounted Factory Floor Installation (if required):
- a. 4" commercial grade manufacturer's dura floor with diamond treadplate surface and marine grade plywood subfloor.
 - b. 36" reinforced diamond treadplate internal ramp.
 - c. 10-gauge stainless steel threshold to provide a smooth transition to the interior cold storage assembly floor.
- K. Integrated, flush-mounted temperature monitor/alarm with sensor and probe-cord length required to extend from the exterior front of the assembly to a mounting position of the sensor within the evaporator return airstream. System to have an easy-to-read LCD with high and low alarm set points with audible and visual alerts for alarm conditions. System to include Adaptive Programming for automatic set point control. Wi-Fi connectivity is included for remote notifications of alarms such as power failure, high and low temperatures, entrapment, and door open. System to include a built-in panic alarm. The system is to be interconnected to the Building Automation System (BAS) or the Owner's Network (by Division 27) and to notify facility personnel of the district/owner choosing when activated.
- L. Heated and illuminated Push Button Panic Alarm with protective cover located inside Walk-In Freezer on panel next to door (handle side) – ADA mounting height. Pre-pipe conduit in panels from Panic Alarm to above the freezer door (or Cooler door if 'inline' assembly) for installation of strobes. Panic Alarm to interconnect to external Strobe Lights by Division 26 and BAS by Division 27. Refer to Section 1.4: OTHER DIVISIONS/CONTRACTORS RELATED WORK; Subsections F. Division 26 (Electrical) and G. Division 27 (Communication) for additional information.
- M. KE2 Smart Access (unless otherwise specified). Confirm all component model numbers for complete installation and operation.
- N. LED surface-mounted light fixture, in quantity/arrangement shown on drawings—light fixtures to be perpendicular to coils. Light fixtures wired to interior and exterior temperature control panel. Light fixtures are to be provided by Section 11 40 00 and installed by Division 26. Division 26 is to seal all conduit penetrations at light fixtures. KEC to verify that penetrations are sealed.

- O. Penetrations of Panels: To be sealed by factory installer and appropriate trade contractors, with Dow Corning 3-6548 silicone RTV foam, total depth of the panel. Trim excess flush. KEC to verify that all penetrations are sealed.
- P. Install closure panels and trim strips to building walls and ceiling with concealed attachment. Closure material: same as wall panels unless noted otherwise.
- Q. Compartment Entrance Doors: 36" x 78" nominal clearance unless otherwise noted.
 - 1. Mount hinged doors on two Kason Model No. 1346; polished chrome-plated nylon cam-lift hinges.
 - 2. Hinge doors as indicated on drawings.
 - 3. Defrost heater: Thermostatically controlled and replaceable at the entire perimeter of all doors, except when using clear Lexan doors (in addition to door jambs). Defrost heaters to be wired for continuous service.
 - 4. 36" high x full-length diamond aluminum treadplate at front and rear of all hinged doors.
 - 5. 12" x 2" engraved phenolic plastic compartment identification sign in Architect's color selection with 1" letters, mounted above door window.
 - 6. 14" x 24" four-panel glass view window with heater and molded non-metallic inner and outer frame. The heater is to be wired and controlled via the door monitor for continuous service.
 - 7. Padlock/key provisions in the door latch with safety release mechanisms as listed below.
 - 8. Kason 1826 Intelli-Vent LED Heated Pressure Relief Ports with Dual Port Vent and Security Light. Locate One (1) 12" below ceiling on Cooler/Freezer common wall panel and One (1) 12" below ceiling on Cooler wall panel. If Cooler and Freezer are separate units, locate one on the Freezer wall panel as well, 12" below ceiling and mounted in the door frame assembly. All ports to have separate dedicated electrical connections and be wired for continuous service. Located and installed by Manufacturer.
 - 9. Kason Model No. 0487 (unless specified otherwise) Frost Free inside release with fiberglass rod and plastic flange with safety flow plastic knob – ADA compliant.
 - 10. Manual backup vacuum release mechanism to punch hole in Freezer door panel assembly to release vacuum within Freezer assembly. Mechanism to include a pull-down handle with freeze- proof hand grip. Handle to have the ability to penetrate and/or punch hole in panel accordingly to assist with opening of door in the event of entrapment (and failure of frost-free inside release button). Door panel to include knock-out section to assist with requirements. Release mechanism assembly to be built-in/mounted to the door assembly structural frame to minimize mechanism tear-out and/or failure. Handle to be painted yellow with phenolic label "Vacuum Pressure Release."
- R. Provide refrigeration calculations and refrigeration alarm to meet local jurisdiction code requirements.
- S. If air screens or air shields are specified above doors or on the interior of the assembly, the manufacturer must provide adequate blocking in panels to support these components and pre-wired electrical connections. Installer to coordinate location of door closure to not interfere with air screens or air shields. Clear-VU swinging door assemblies are not required if air shields are specified.
- T. S/S trim above cold storage assembly to conceal manufacturers ceiling grid.
- U. Field-check all horizontal/vertical measurements and conditions at the building before fabrication or delivery of equipment.
- V. Cold Storage Assemblies to be installed by Manufacturer pre-approved installers.
- W. Installer to seal all holes in Cold Storage Assembly.

2.34 COLD STORAGE REFRIGERATION SYSTEMS

- A. Unit Coolers: specified quantity and model, ceiling-hung by ½" o.d. nylon bolts with stainless steel washers and nuts. Insert hanger bolts through plastic sleeve and seal penetration airtight.

1. Unit cooler drain fittings: positioned as indicated on drawings. Installation of cast tee-fittings on drain pan outlet with union and cleanout plug and extension of 1" Type K copper drain line through wall panel to air-gap fitting or floor drain under this Section.
2. Slope drain line 1/2" per foot, trap at exterior of assembly and turn down into drain. Manifold drain lines of adjacent compartments wherever possible.
3. Install drain line plastic sleeve through compartment wall, seal around drain line and install stainless steel escutcheon with setscrews.
4. Electric drain line heater cable (self-regulating 7 watts): on all unit coolers operating below 36oF., installed from coil drain line fitting to wall penetration under this Section. Heater cables: minimum rating of 15 watts/lineal foot, 208 volts, single phase. Wrap drain line with maximum 2" loop spacing and interwire to unit cooler for continuous operation.
5. Mounted, pre-piped and pre-wired evaporator components:
 - a. Sporlan thermostatic expansion valve with external equalizer.
 - b. Shut-off valve at evaporator suction and liquid lines.
 - c. Sporlan "Catch-All" refrigerant filter/dehydrator on liquid line.
 - d. White Rogers 1609-101 adjustable thermostat with remote bulb positioned in return air-stream of evaporator.
 - e. Electrical disconnect switch in NEMA 4 enclosure.
 - f. For any facility within 20 miles of a salt air environment: Condenser and Evaporators to be built with Electrofin coating to retard salt air deterioration. Coils are to be coated with Technicoat 10-2 coating for protection against a salt air environment.

B. Refrigerant System Installation.

1. Refrigerant Lines; Type "L" hard copper tubing. Fittings: wrought copper or brass designed for use with high temperature solder. Piping joints: made with silver solder (Sil-Fos). Piping: properly suspended from and anchored to the structure with adjustable hangers 6' o.c. maximum. Suction lines: sized to have maximum pressure drop of two pounds in medium temperature systems; one pound in low temperature system. Liquid lines: sized to give maximum pressure to prevent trapping of oil. Insulation on all suction lines: Armaflex insulation by Armstrong. 3/4" thick at medium temp 1" thick at low-temp. Refrigerant lines in PVC or EMT conduit: sealed at both ends with Dow Corning 3-6548 silicone RTV foam. Exterior Refrigerant Lines to be wrapped by refrigeration system installer in self-fastening jacket of Type 3003-H14 aluminum alloy 0.016-inch thick. Provide aluminum strapping and seals for applying aluminum jacket and covers according to manufacturer's recommendations to provide completely weather-tight covering.

C. Evacuation and Charging.

1. After completion of the pressure test, the system shall be evacuated using an approved auxiliary vacuum pump. Connections for evacuation: in accordance with manufacturer's recommendations.
2. Charging subsequent to the initial charge, which is contained in the condensing unit (Type of Refrigerant to meet District Standards, Industry Standards and Codes.) - Non- CFC Ozone Depletion Refrigerant on low temp units) – (Refrigerant must meet local codes): given through the charging valve in the high side passing all of the liquid refrigerant through a charging dehydrator. All charging lines and gauges: purged of air prior to connection with system. Refrigerant: unused and shall be delivered in clean containers. After the system is fully charged: start and place in full operation.

2.35 PRE-APPROVED KITCHEN SUPPLIERS

- A. Only the following named Subcontractors and those approved later, if any, are approved for inclusion in the Contractor's Bid.
- B. Any supplier requesting for inclusion within this bid will be required to submit AIA form 305 minimum 14 days prior to bid date for review, or as required by Architect.
 1. Ed Don & Company, Mr. Scott Jost, 3501 Plano Parkway, The Colony, Texas 75056, Phone: (972) 624-7460, Fax: (972) 624-7762, E-mail: scottjost@don.com
 2. Kirby Restaurant Supply, Mr. Brian Kernan, 809 S. Eastman Road, Longview, Texas 75602, Phone: (903) 757-2723, Fax: (903) 757-9519, Email: briank@kirbyrestaurantsup.com

3. Oswalt Restaurant Supply, Mrs. Lindsay Reece, 4532 Enterprise Dr, Oklahoma City, OK 73128, Phone: (405) 843-9000, Email: lindsay.reece@oswalt.biz
4. Supreme Fixture Co. Inc., Mr. Tim Hampel, 11900 Vinny Ridge Road, P.O. Box 193655 Little Rock, Arkansas 72219, Phone (501) 455-2552, Fax: (501) 455-0802, Email: tim@supremefixture.com

PART 3 - EXECUTION

3.1 DELIVERY AND INSTALLATION

- A. Supervision: provide a competent foreman or supervisor who shall remain on the job during the entire installation.
- B. Delivery: coordinate with progress of construction and Owner's operation schedules. Unless otherwise instructed and documented by Owner or General Contractor, the following procedures apply:
 1. Field-Assembled Fixed Equipment integrated into the structure (e.g., cold storage assemblies, exhaust hoods, drain trench/grate assemblies, conveyor systems, ceiling-mounted utensil racks, etc.) are to be sent to the jobsite when directed by the General Contractor and installed/protected accordingly.
 2. All other Fixed Equipment: delivered after completion of work on adjacent finished ceilings, lighting, finished floor and wall systems, including painting.
 3. Major Movable Equipment: delivered when possible to inventory in secured area for interim job-site storage or, if secured area is not available, when fixed equipment installation/clean-up has been completed.
 4. Minor appliances and loose items (e.g., pans, covers, flatware containers, etc.) delivered only when Owner is prepared to receive and inventory such items.
- C. Installation: performed by manufacturer of custom fabricated fixtures.
 1. Assemble, square, level and make ready all items for the final utility's connections.
 2. Cut neatly around obstructions to provide sanitary conditions.
 3. Where gaps of $\frac{1}{4}$ " or less occur adjacent to or between equipment, insert rope backing and smoothly-applied General Electric construction sealant Series SE-1200 silicone mastic (white color). Mask both sides of gap for neat application of sealant and remove excess. If space exceeds $\frac{1}{4}$ ", neatly install 18-gauge stainless steel trim molding of proper shape with concealed attachment. Use epoxy cement or "Z" clips wherever possible to secure stainless steel trim. Exposed edges or corners of trim: eased and smooth.
 4. Refrigeration coil drain line runs to indirect drain connection greater than 2" from face of wall or panel: either of the following field procedures.
 - a. Trench the floor and provide 6" wide x 2" deep 16-gauge stainless steel sloping (-1" to -2") trough from face of cooler/freezer wall to body of floor sink/floor drain. Trough: turned up 4" at wall; $\frac{3}{4}$ " flange with $\frac{1}{2}$ " turndown at both long sides. Set trough in waterproof mastic and seal 1" o.d. drain tube penetration into floor sink/floor drain at -2 $\frac{1}{2}$ " bff. Patch the floor to match adjacent material/surface.
 - b. Provide 12" x 6" x 2" deep 16-gauge stainless steel condensate pan mounted to cooler/freezer wall at 6" aff clear. Trench the floor and install 1" o.d. drain line from bottom of pan to body of floor sink/drain. Slope drain line $\frac{1}{4}$ " per foot and seal all connections watertight. Patch the floor to match adjacent material/surface.
- D. Protection of Work:
 1. Fabricated fixtures: fiberboard or plywood taped to tops and exposed body panels/components.
 2. Manufactured Equipment: fiberboard or plywood taped as required by equipment shape and installation-access requirements.
 3. Prohibited use of equipment: tool and materials storage, workbench, scaffold, stacking area, etc.
 4. Damaged Equipment: immediately documented and submitted to Owner with Contractor's recommendation of action for repair or replacement and its impact on the Project Schedule and Contract Amount, if any.

3.2 CLEAN AND ADJUST

- A. Clean up and remove from the job site, all debris resulting from this Work as the installation progresses.
- B. Thoroughly clean and polish interior/exterior of all Foodservice Equipment, prior to demonstration and final observation, ready for Owner's use.
- C. Lubricate and adjust drawer slides, hinges, casters.
- D. Adjust pressure regulating valves, timed-delay relays, thermostatic controls, temperature sensors, exhaust hood grilles, etc.
- E. Clean or replace faucet aerators, line strainers.
- F. Touch-up damage to painted finishes.
- G. G. Start up and check operation of all refrigeration systems for at least 72 hours prior to acceptance.

3.3 EQUIPMENT START-UP/DEMONSTRATION

- A. Carefully test, adjust and regulate all equipment in accordance with the manufacturer's instructions and certify in writing to the Owner that the installation, adjustments and performance are in full compliance.
- B. Provide the Owner or Foodservice Operators with a thorough operational demonstration of all equipment and furnish instructions for general and specific care and maintenance. Coordinate and schedule selected items of equipment and attendees with Owner at least two weeks in advance of demonstration periods.

3.4 FINAL OBSERVATION

- A. Final observation will be made when the Contractor will certify that he has completed his work, made a thorough review of the installation/operation of each item in the contract and found it to be in compliance with the Construction Documents.
- B. Repetitive final observations (more than two) and all costs associated thereto which may be incurred due to the Contractor's failure to comply with the requirements of this Article will be invoiced to this Contractor on a \$70.00/hr. and expense basis.

PART 4 - EQUIPMENT SCHEDULE

- 4.1 REGULARLY-MANUFACTURED EQUIPMENT/COMPONENTS: Standard finishes and accessories unless specifically deleted or superseded by the Contract Documents.
- 4.2 FABRICATED AND FIELD-ASSEMBLED EQUIPMENT: Arrangement and configuration as shown on Plans, Elevations, Detail Drawings and outlined in Specifications.
- 4.3 REFER TO DRAWINGS: For unit quantities and electrical or mechanical provisions required, including manufacturer's optional voltages, wattages, burner capacities, etc.
- 4.4 REFER TO PART 2 – PRODUCTS: For accessories, fittings, requirements and procedures related to the listed buy-out and fabricated equipment.
- 4.5 ALTERNATE MANUFACTURER REQUIREMENTS: A specific product manufactured by the listed pre-approved equals shown under Section 4.7 Foodservice Equipment are acceptable only if the specific product can evidence compliance with the specified line items and the contract documents.
- 4.6 RE-USED EXISTING EQUIPMENT IF SHOWN
 - A. Existing equipment scheduled for re-use is to be inventoried and documented that equipment is in operating condition once Kitchen Contractor has taken ownership.
 - B. Provide pictures of all equipment once inventoried and issue to the architect to ensure that equipment has not been damaged.

- C. Verify locations of all equipment with owner.
- D. Existing equipment that is to be reused may be missing parts or accessories for proper and complete operation. Submit report listing all items with pricing for approval to allow complete installation.
- E. Utility disconnection and re-connection: under Divisions 22 and 26. Kitchen Contractor to verify utility requirements of existing equipment and coordinate with Kitchen Consultant as required. All utilities not scheduled for re-use to be capped and covered by required disciplines.
- F. Disassembly, removal, transportation and relocation: under this Section and scheduled with General Contractor. Owner's representative must be present, coordinate date / time with owner.
- G. Thoroughly clean inside and out prior to relocation.
- H. Review functional parts (e.g., doors, controls, heating elements, compressors, etc.) and submit report of required repairs and estimate of cost. Any finishes or equipment damaged due to construction to be repaired as required.
- I. Existing equipment not scheduled for reuse is to be carefully removed/relocated by the Kitchen Contractor per the Owner's direction. Kitchen Contractor to coordinate date / time with General Contractor and Owner.
- J. Removal or replacement of existing equipment is to be scheduled for times of least interruption and inconvenience to the foodservice operation. Submit proposed schedule of time frame, task sequence and operation for approval prior to starting work.
- K. Kitchen Contractor to verify size and shape for all existing equipment being re-used and coordinate with Foodservice Consultant as required.
- L. Any modification(s) required/desired for re-used existing equipment to be verified by the Kitchen Contractor. All modifications must be approved by the Owner and Foodservice Consultant prior to the modifications being made.
- M. The KEC is to verify and coordinate all of the utility requirements with the construction documents as required. Refer to the general specifications re: conflicts.

4.7 FOODSERVICE EQUIPMENT

- A. All equipment to have a performance check from factory authorized personnel. Warranties will begin on the day of performance check.
- B. All equipment and internal components should be of domestic origin where possible.
- C. Architectural coordination items for potential Food Service color or material selections.
 - 1. Countertops: Stone (stainless steel is provided unless otherwise specified)
 - 2. Tray slides: Corian or Stone (stainless steel is provided unless otherwise specified)
 - 3. Counter fronts: Ceramic tile, 3 Form, Plastic Laminate
 - 4. Sneeze Guards: Stone insets.
 - 5. General color/graphic selections:
 - a. Display Air Screen Merchandisers - Color selection: Powder coat or Plastic Laminate (stainless steel is provided unless otherwise specified)
 - b. Bakery Display Cases - Color selection: Powder coat or Plastic Laminate (stainless steel is provided unless otherwise specified)
 - c. Pass Thru or Reach-in Holding Cabinets – Color selection: Powder coat (Mfg: True) or Plastic Laminate (Mfg: Traulsen). (Stainless steel is provided unless otherwise specified).
 - d. Hanging Heat Lamps, track and fixture colors.
 - e. Heated Merchandisers
 - f. Color of Portable Guide rails, stanchions and belt
 - g. Popcorn machine: signage

- h. Bottle Cooler: signage
- i. Graphic package information
- j. Hot food well covers

D. General Architectural finishes:

- 1. Walls: Ceramic Tile, Flat FRP, Molded FRP, (as approved by local jurisdiction).
- 2. Ceilings: Removable Vinyl Face Tile (easily cleanable as approved by local jurisdiction).
- 3. Floors – Tile, Epoxy, Rubberized flooring system (coordinate floor tile transition at serving lines)
- 4. Floors – Cold Storage assembly. Extend kitchen floor flush into walk-in assembly with coved base.
- 6. Furr downs above Serving Counters

CONCESSION STAND

ITEM NO. 107 DRY STORAGE SHELVING

QUANTITY 1

Manufacturer: Cambro
Model: Camshelving Premium Series
Size and Shape: Refer to drawings
Alternate: Metro

1. Each unit to be five (5) tiers high with open grid shelving.
2. Four (4) 86" posts per unit.
3. Quantity One (1) to equal One (1) Lot: all shelving shown within the dry storage room.
4. Refer to drawings for size, width and lengths.
5. Verify shelving requirements with approved submittal prior to ordering.

ITEM NO. 109 ICE MAKER WITH BIN - 500 LB CAPACITY

QUANTITY 1

Manufacturer: Manitowoc
Model: IYT-0450A/D570
Size and Shape: Refer to drawings
Alternate: ----

1. Energy Star Rated.
2. Stainless steel bin.
3. Stainless steel legs.
4. Provide bin adapter kit as required.
5. Easy Touch Controls, set filter reminders, get error messages/faults, program run/stop times, display serial/model information, view step-by-step cleaning/sanitizing prompts, view warranty expiration timer.
6. Provide Luminice II Virus and Bacteria Inhibitor.
7. Provide sizes and quantities as required: Dormont s/s water disconnect from filter to Ice Machine.
8. Cord and plug assembly, coordinate NEMA configuration with electrician.
9. One (1) pre-filter and water filter sized to manufacturers recommendations. Provide two (2) sets of replacement filters. Mount on wall adjacent to ice machine in an easily accessible location.
10. Coordinate cord and cap with receptacle. Water supply to filter to be hard copper plumbed. 72" long flex hose from filter to ice maker with 48" wall restraint cable. Interconnection thru water filter to ice machine and final connection by Division 22. Water filter overflow tube to be strapped to back side of ice machine and extend to 1" above floor sink.

ITEM NO. 124 WORKTABLE W. OVERSHELF

QUANTITY 1

Manufacturer: Custom Fabricated
Model: ---
Size and Shape: Refer to drawings
Alternate: ---

1. Top: 14 gauge type 304 S/S top with 6" high backsplashat wall and 2" turndown at free sides.
2. Open base construction.
3. 16 gauge S/S overshef post mounted 18" above working surface.
4. 16 gauge S/S undershef.
5. Two (2) 20" W x 20" L drawer assemblies. Component Hardware #S52-2020 drawer slides with delrin bearings - 200lb capacity. Component Hardware #S81-2020C drawer pan.
6. Close back of splash when exposed.

ITEM NO. 129 WORKTABLE W. S.BAR UT.RACK

QUANTITY 1

Manufacturer: Custom Fabricated
Model: ---
Size and Shape: Refer to drawings
Alternate: ---

1. Top: 14 gauge type 304 S/S, 2" turn down at free sides.
2. Open base construction.
3. 16 gauge S/S undershelf.
4. Two (2) 20" W x 20" L drawer assemblies. Component Hardware #S52-2020 drawer slides with delrin bearings - 200lb capacity. Component Hardware #S81-2020C drawer pan.
5. Flanged feet.
6. Post mounted utensil rack, extend 1-5/8" diameter S/S post from cross rail, thru top to 78" A.F.F. and weld full length x 2" x 1/4" S/S bar with Component Hardware model no. V-77-4401 S/S sliding hooks at 8" on center. Verify height with Owner.
7. Provide a duplex receptacle and housing mounted below countertop per drawings. Interconnect and prewire a 5'-0" cord and plug out of receptacle housing for plugging into ceiling drop cord receptacle. 114000 and Div. 26 to coordinate location of drop cord receptacle.

ITEM NO. 196 BACK COUNTER - OPEN BASE - W/3-COMP SINK

QUANTITY 1

Manufacturer: Custom Fabricated
Model: ---
Size and Shape: Refer to drawings
Alternate: ---

1. Top: 14 gauge type 304 S/S, 2" turn down at free sides. 4" splash where adjacent to equipment and walls.
2. Open base construction.
3. Fully welded three compartment sinks with lever drains and deck mounted faucets.
4. Full length 16 gauge S/S undershelf.
5. 6" S/S adjustable feet.

ITEM NO. 214 CASH REGISTER

QUANTITY 2

Manufacturer: Owner Furnished
Model: ---
Size and Shape: Refer to drawings
Alternate: ---

ITEM NO. 230 FRONT CONCESSION COUNTER

QUANTITY 1

Manufacturer: Custom Fabricated
Model: ---
Size and Shape: Refer to drawings
Alternate: ---

1. 14 gauge type 304 S/S, 2" turn down at free sides. 4" splash where adjacent to equipment and walls. Coordinate splash with concession window.
2. Counter to extend through concession window with 2" turndown, with hemmed edge, on customer side.
3. Provide S/S fully welded window frame at concession window on both sides. All trim to be fully welded.
4. Open base construction.
5. Countertop 34" high.
6. Coordinate with roll down door, by General Contractor.
7. Stainless steel undershelves where shown per plans.

8. 6" Stainless steel adjustable feet.
9. Provide grommets in countertop for countertop equipment.

ITEM NO. 262 HAND SINK - WALL MTD

QUANTITY 1

Manufacturer: Aero
Model: HSF Modified
Size and Shape: Refer to drawings
Alternate: Advance Tabco, Eagle

1. Hand Sink, wall model, 14" wide x 10" front-to-back x 5" deep bowl.
2. 3 1/2" gooseneck splash mount faucet with wrist blade operation.
3. Basket drain and wall bracket.
4. P-Trap assembly, delete open/close drain valve.
5. Soap and Towel Dispensers by Owner.
6. Custom fabricated removable end splashes on sides as required by code. Height same as the rear splash.
7. Division 22 to provide temperature adjustment valves as required

ITEM NO. 386 REACH-IN REFRIGERATOR 1DR

QUANTITY 1

Manufacturer: Traulsen
Model: G1000-
Size and Shape: Refer to drawings
Alternate: ---

1. Anodized aluminum interior and sides S/S exterior front.
2. Interior lights with bulbs.
3. Exterior digital thermometer.
4. Locking hardware.
5. Total of five (5) epoxy coated shelves per section.
6. 6" high adjustable S/S legs.
7. Half height doors hinged as per plan.
8. Furnish start-up and Six (6) years parts and labor warranty.
9. Seven (7) years compressor warranty.

ITEM NO. 388 REACH-IN FREEZER - 1DR

QUANTITY 1

Manufacturer: Traulsen
Model: G1200-
Size and Shape: Refer to drawings
Alternate: ---

1. Anodized aluminum interior and sides S/S exterior front.
2. Interior lights with bulbs.
3. Exterior digital thermometer.
4. Locking hardware.
5. Total of five (5) epoxy coated shelves per section.
6. 6" high adjustable S/S legs.
7. Half height doors hinged as per plan.
8. Furnish start-up and Six (6) years parts and labor warranty.
9. Seven (7) years compressor warranty.

ITEM NO. 644 ELECTRIC CORD REEL

QUANTITY 1

Manufacturer: By Electrical Contractor
Model: ---
Size and Shape: Refer to drawings
Alternate: ---

1. Provided by Trade Contractor.

ITEM NO. 801 SLIDE DOOR REFRIGERATOR

QUANTITY 2

Manufacturer: True
Model: GDM-33-HC-LD
Size and Shape: Refer to drawings
Alternate: ---

1. Two (2) section refrigerated merchandiser.
2. Eight (8) shelves.
3. Black exterior, finished back.
4. Stainless steel interior liner.
5. Two (2) Low-E thermal glass sliding door.
6. LED interior lighting.
7. Ratchet locks.
8. 2-1/2" (64mm) diameter casters.
9. Located in the Baseball/Softball Concessions.

END OF CONCESSION STAND

SECTION 11 92 00

AGRICULTURAL EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Steel Tube panels and gates
 - 2. Cattle chute with head gate
 - 3. Automatic waterers
- B. Related Sections:
 - 1. Division 22 - Plumbing; water supply to automatic waterers

1.2 SUBMITTALS

- A. Product Data: Manufacturer's complete product information for each item specified including catalog cuts, data sheets, parts list, installation instructions, and performance characteristics and criteria.
- B. Shop Drawings: Indicate materials, construction, sizes, quantities, finishes, and installation details including coordination with other trades.

1.3 QUALITY ASSURANCE

- A. Provide accessories of the same type from the same manufacturer throughout the project.

PART 2 - PRODUCTS

2.1 FABRICATION

- A. Steel Tube Panels - Cattle
 - 1. Premier Series, as manufactured by Priefert Manufacturing or approved equal.
 - 2. Size: 101.75" length
 - 3. Fabrication: Include the following
 - a. Top and bottom horizontal rails, equally spaced intermediate horizontal rails, vertical end posts, and intermediate vertical spacers: 1.66-inch OD, 16 gage high tensile steel tubing with 8.5" spacing between rails (center to center).
 - b. Saddle-cut and weld all joints. Provide a hole at one end for galvanizing after fabrication.
 - c. Provide pin connections.
 - d. Number of stays: 1
 - e. Weight: 79 lbs
- B. Steel Tube Sweep Panels - Cattle
 - 1. Premier Series, as manufactured by Priefert Manufacturing or approved equal.
 - 2. Size: 64 inches high x width as indicated
 - 3. Fabrication: Include the following
 - a. Top and bottom horizontal rails, equally spaced intermediate horizontal rails, vertical end posts, and intermediate vertical spacers: 1.66-inch OD, 16 gage high tensile steel tubing.
 - b. Saddle-cut and weld all joints. Provide a hole at one end for galvanizing after fabrication.
 - c. Provide chain connections, J-legs, and fishhook top corners.
 - d. Panels and gates mount on separate posts.
- C. Steel Tube Alley Panels and Frames
 - 1. Premier Alley Panels, as manufactured by Priefert Manufacturing or approved equal.
 - a. Size: 64 inches high x width as indicated
 - b. Fabrication: Include the following
 - c. Vertical stay constructed from 1.050" OD steel tubing, fitted through drilled rails with pin connectors to allow for connection for other components.
 - 2. Premier Alley Frames:
 - a. Size: 35.5" width x 77.25" height
 - b. Constructed from 2.0" OD 11 gauge horizontal and vertical tubing.

- c. Inside alley: 28" width vty 74.50" height.
- D. Steel Tube Panels - Sheep, Hog & Goat Panels
 1. Vertical Rail 49 inch Sheep, Hog & Goat Panels with filler panel at bottom, as manufactured by Priefert Manufacturing or approved equal.
 2. Size: 49 inches high x width as indicated
 3. Fabrication: Include the following
 - a. Top and Bottom Horizontal Rails and Vertical End Posts: 1.05-inch OD, 18 gage high tensile steel tubing.
 - b. Equally spaced intermediate Vertical Posts: 1.50-inch OD, 18 gage high tensile steel tubing set on 4" centers.
 - c. Saddle-cut and weld all joints. Provide a hole at one end for galvanizing after fabrication.
 - d. Provide 2 mounting clips welded to each end post.
 - e. Self-contained connecting pins.
- E. Steel Tube Curved Panels - Cattle
 1. Vertical Rail Premier Curved Panel with SSRB sweep radius bow, as manufactured by Priefert Manufacturing or approved equal.
 2. Size: 96" length
 3. Weight: 73 lbs
 4. Height: 64" to top rail (not including fishhooks)
 5. Fabrication: Include the following
 - a. Top and Bottom Horizontal Rails and Vertical End Posts: 1.05-inch OD, 16 gage high tensile steel tubing.
 - b. Number of stays: 1
 - c. Number of rails: 6
 - d. Saddle-cut and weld all joints. Provide a hole at one end for galvanizing after fabrication.
 - e. Panel has both connector brackets and chain connectors on each end to provide tight, secure connections.
 - f. Single piece vertical stay fitted through drilled rails.
 - g. Radius Bow: 135 degree sweep.
- F. Steel Tube Walk through Panels in Frame - Cattle
 1. Premier Walk Thru Panels, as manufactured by Priefert Manufacturing or approved equal.
 2. Size: Gate frame height of 84"
 3. Fabrication: Include the following
 - a. Top and bottom horizontal rails, equally spaced intermediate horizontal rails, vertical end posts, and intermediate vertical spacers: 1.66 OD, 16 gage high tensile steel tubing with vertical latch.
 - b. 4' wide walk through gate with vertical latch.
 - c. J-legs and fishhook top corners.
- G. Steel Tube Gate in Frame - Sheep, Hog & Goat Bow Gates
 1. Vertical Rail 49-inch Sheep, Hog & Goat Bow Gates, as manufactured by Priefert Manufacturing or approved equal.
 2. Size: 81.5" overall bow frame height; 80 inches clear under top horizontal frame rail, x width as indicated
 3. Fabrication: Include the following
 - a. Horizontal Rail, Gate Horizontal Rails, Gate Height and Vertical Height Posts: 1.05-inch OD, 18 gage high tensile steel tubing.
 - b. Equally spaced intermediate Vertical Posts: 4" o.c., 18 gage high tensile steel tubing.
 - c. Saddle-cut and weld all joints. Provide a hole at one end for galvanizing after fabrication.
 - d. Provide 2 mounting clips welded to each end post.
 - e. Panels and gates mount on separate posts.
 - f. Vertical sliding gravity latch.
 - g. Standard pipe hinges per manufacturer.
 - h. Self-contained connecting pins.
- H. Squeeze Chute with Head Gate:
 1. Squeeze Chutes - Model S04 with Priefert 91 Headgate as manufactured by Priefert Manufacturing or approved equal.
 - a. Size 94.5 inches long x 53 inches wide x 80 inches high.
 - b. All controls on front corner of chute for one-person operation.
 - c. Retractable squeeze arm allows safe, unrestricted, movement around chute by Operator.
 - d. Removable side panel, 10 drop gates (five on each side) and bottom access panels.

- e. Headgate with head chain.
- I. Waterer - Swine:
 - 1. EdstromDirect, Hog Nipple, 1000-0743-010
 - a. Stainless steel construction
 - b. 1/2-inch mpt connection
 - c. Size: 2-7/8 inches long, with 5/8-inch wrench pads
 - d. Operating pressure: 1-50 psi
 - 2. Provide one waterer at each swine pen.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces and locations for accessory installation and notify Architect of conditions that may be detrimental to installation and performance. Do not begin installation until unsatisfactory conditions have been corrected.
- B. Beginning of installation will constitute acceptance of existing conditions.

3.2 INSTALLATION

- A. Install items according to the manufacturers' instructions, recommendations and approved Shop Drawings.

3.3 ADJUSTING

- A. Adjust gate latches and hinges to operate without binding.
- B. Adjust float switch in each automatic waterer to maintain required water level without overflowing. Ensure that waterers and connecting water hoses do not leak.

3.4 PROTECTION

- A. Protect the completed work from damage. Replace damaged items which cannot be repaired.

END OF SECTION

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SECTION 12 24 13

ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Manually operated roller shades.

1.2 SUBMITTALS

- A. General: Submit in accordance with Section 01 33 23 - Shop Drawings, Product Data, and Samples.
- B. Product data for each type of shade specified. Include printed data on physical characteristics. Include warranty information.
- C. Shop drawings showing location and extent of shades. Show installation details at and relationship to adjoining work. Include elevations indicating shade units. Indicate locations of shade controls.
- D. Samples for Verification Purposes: One 18-inch-square sample of shade material for each color, texture, and pattern of shade required.
- E. Submit manufacturer's maintenance data for shades.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has specialized in installing shades similar to those required for this Project.
- B. Surface Burning Characteristics: Provide shades identical to those tested for the following fire performance characteristics as determined by testing identical products, by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Field-Constructed Mockup: Prior to installing shades, prepare mockups for each form of construction and finish required to verify selections made under sample submittals, to demonstrate aesthetic effects and to establish application quality standards.

1.4 PROJECT CONDITIONS

- A. Field Measurements: Check openings by field measurements before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay in the work.

1.5 WARRANTY

- A. Twenty-Five-year warranty on the following.
 - 1. Manually operated components.
 - 2. Shade cloth, with provision that it will not deteriorate, sag or warp and will remain fit for use for the full warranty period.
 - 3. Hardware components to be free from defects in material and workmanship under normal and proper use.

1.6 EXTRA MATERIALS

- A. Extra Materials: Furnished from same production run as products installed, packaged with protective covering for storage, and identified with labels describing contents. Deliver extra materials to Owner.
 - 1. Shades: Furnish quantity of full-size units equal to 5 percent of amount installed.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Basis of Design Roller Shades: Provide roller shades as manufactured by MechoShade Systems, Inc. (phone 214-585-0469)
 - 1. Equivalent Roller Shades manufacturers:
 - Draper, Inc.
 - Hunter Douglas
 - Mechoshade Systems, Inc.

2.2 PRODUCTS

- A. Manual Shades: Provide Mecho/5 manually operated with Lift-Assist Mechanism (LAM), regular roll, no cost pocket units, shade cloth falling at window side of roller, as manufactured by MechoShade Systems, Inc. (phone 214-585-0469) or approved equivalent.
- B. Shadecloth shall meet requirements of Fed. Spec. CCC-C-521 E for fire retardancy, NFPA 701 Small-Scale and/or NFPA 701 Large-Scale requirements. Antimicrobial without topical treatment. ASTM E-84: Flame Spread 17, Smoke Density Index 118, Shadecloth seconds or shadecloth manufactured using reprocessed materials are not acceptable.
- C. Sunscreen Material Fabrics:
 - 1. Provide ThermoVeil™ 1500 group sunscreen, dense basket weave, 3% openness factor. Color as scheduled in "Material Finish Schedule" in drawings.
- D. ANSI/WCMA A100.1: Manual cords or chains shall be furnished with a tensioned hold-down device permanently attached.

2.3 MATERIALS AND FABRICATION

- A. Components: Noncorrosive, self-lubricating materials.
- B. Pockets/Snaploc™ Fascia:
 - 1. Pocket with exposed tile support and pocket closure with clear anodized finish, MechoShade pocket shall be no cost gyp board pocket.
 - 2. Accessibility by removing closure. No exposed screws or mounting means. Pocket shall be sized for a single shadeband.
- C. Installation Fasteners: Not less than two fasteners per bracket, fabricated from metal non-corrosive to shade hardware and adjoining construction and to support shades under conditions of normal use.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings where shades will be installed prior to beginning installation. Verify that critical dimensions are correct and surface conditions acceptable.
 - 1. Complete all finishing operations, including painting, before beginning installation.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install shades level and plumb in accordance with manufacturer's instructions and approved submittals, mounted not less than 1 inch from face of exterior glass.
- B. Install metal parts isolated from concrete or mortar to prevent corrosion.
- C. Install mounting brackets with at least two fasteners per bracket.

3.3 CLEANING

- A. After completing the installation, clean shade surfaces according to the manufacturer's instructions.
- B. Remove surplus materials, packaging, rubbish and debris resulting from the installation. Leave areas where installation occurred neat, clean, and ready for use.

END OF SECTION

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SECTION 12 32 16

MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plastic laminate-faced casework as shown on drawings.
 - 2. The fabrication and installation of standard casework components of base cabinets, wall cabinets, storage cabinets, wardrobe cabinets, shelf units and other units as indicated.
 - 3. The fabrication and installation of custom units, as detailed in the drawings.
- B. Related Sections:
 - 1. Section 06 10 00 - Rough Carpentry; blocking.
 - 2. Section 08 14 23 - Plastic-laminate-faced Wood Doors
 - 3. Section 09 65 00 - Resilient Flooring; coved rubber base.
 - 4. Section 11 31 00 - Appliances
 - 5. Section 22 40 00 - Plumbing Fixtures

1.2 SUBMITTALS

- A. Product Data: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. Include manufacturer's installation instructions for each type of casework unit.
- B. Samples: Submit 6" x 6" samples of specified finishes, including top material. Samples will be reviewed by Architect for color, texture and pattern only. Compliance with other specified requirements is exclusive responsibility of contractor.
- C. Shop Drawings:
 - 1. Submit shop drawings for plastic laminate-faced casework showing plans, elevations, ends and cross-sections. Show details and location of anchorages and fitting to floors, walls and base. Include layout of units with relation to surrounding walls, doors, windows and other building components.
 - 2. Coordinate shop drawings with other work involved.
- D. Mock-up Casework:
 - 1. Submit one full-size sample of finished base cabinet unit complete with hardware, doors and drawers, without finish top.
 - 2. Submit one full-size sample of finished wall-mounted cabinet unit complete with hardware, doors and adjustable shelves.
 - 3. Furnish both hinged and rolling door samples.
 - 4. Acceptable sample units will be used for comparison inspections at project. Unless otherwise directed, acceptable sample units may be incorporated in work. Notify Architect of their exact locations. If not incorporated in work, retain acceptable sample units in building until completion of work and remove sample units from premises when directed by Architect.

1.3 QUALITY ASSURANCE

- A. Single Source Responsibility: Provide casework with tops and accessories manufactured or furnished by same casework company for single responsibility.
- B. Catalog Standards:
 - 1. The use of catalog numbers and specific requirements set forth in drawings and specifications are not intended to preclude the use of other acceptable manufacturer's product or procedures which may be equivalent, but are given for purpose of establishing standard of design and quality for materials, construction and workmanship.
 - 2. Custom units shall be of the same quality as standard units specified.

- C. AWS Quality Standard: Comply with grades of interior architectural woodwork, construction, finishes and other requirements of the "Architectural Woodwork Standards", 2nd Edition, 2014, adopted and published jointly by Architectural Woodwork Institute (AWI), Architectural Woodwork Manufacturers Association of Canada (AWMAC), and Woodwork Institute (WI), except as otherwise indicated.
 - 1. Use Premium Grade, except use Economy Grade for millwork in custodian closets and storage rooms. Items not given a specific quality grade shall be Premium Grade.
- D. Color Uniformity: Provide plastic laminate for laminate-clad casework and plastic faced wood doors from the same manufacturer.
- E. Manufacturer shall have at least 5 years' experience and have done installations for similar types of projects.
- F. Accessibility Standards: The following special requirements shall be met, where required to comply with Texas Accessibility Standards (TAS).
 - 1. Countertop height with or without cabinet below, not to exceed a height required by TAS.
 - 2. Kneespace clearance to be minimum clearance as required by TAS.
 - 3. 12" deep shelving, adjustable or fixed not to exceed a range as required by TAS.
 - 4. Wardrobe cabinets to be furnished with rod/shelf adjustable to 48" A.F.F. at a maximum 21" shelf depth.
 - 5. Sink cabinet clearances as required by TAS.
 - 6. Cabinet locks, latches, and other operating mechanisms shall be mounted to comply with forward reach requirements of TAS; i.e. 15" to 48" above finish floor, except locked bottom drawers at base cabinets.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver plastic laminate-faced casework only after wet operations in building are completed.
- B. Store completed plastic laminate-faced casework in a ventilated place, protected from the weather, with relative humidity therein of 50% or less at 70°F.
- C. Protect finished surfaces from soiling and damage during handling and installation. Keep covered with polyethylene film or other protective covering. Woodwork damaged through neglect of the above requirements shall be repaired or replaced without additional cost to the Owner.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Install finish carpentry products only when temperature and humidity conditions have been stabilized and will be maintained.
- B. Maintain temperature and moisture conditions as recommended by woodwork fabricator from date of installation through remainder of construction period.

1.6 GUARANTEE

- A. Provide 5-year guarantee against defective materials and workmanship.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Manufacturer's catalog numbers for Case Systems, Inc. (website: www.casesystems.com, phone 989-496-9510) are shown on drawings and included in specifications for convenience in identifying certain cabinet work. Unless modified by notation on drawings or otherwise specified, catalog description for indicated number constitutes requirements for each such cabinet, hardware, or equipment.
- B. Subject to compliance with requirements of this specification, Case Systems, Inc. equivalent plastic laminate-faced casework as manufactured by one of the following will be acceptable:
 - CIC Concepts in Cabinetry
 - Jericho Woodworks
 - Jim R. Reynolds & Assoc.

2.2 GENERAL

- A. Decorative laminate casework shall be Case Systems as specified or approved equal with the following minimum features:
1. M-2 45# density engineered particleboard for cabinet components meeting or exceeding all requirements as set by ANSI A208.1-2022.
 2. PVC edges applied with hot melt.
 3. Epoxy coated, self closing, minimum 150# static rated drawer slides with lifetime warranty.
 4. Non-Racking, Non-Deflecting Platform Drawer Box With 1/2" Thick Bottoms.
 5. 1/2" Thick Cabinet Back.
 6. "Balanced" High pressure laminates applied with rigid PVA glue.
 7. Thermally Fused Laminate Interior, excluding backs of doors and drawers, complying with requirements of NEMA LD3, Grade VGL, for Test Methods 3.3, 3.4, 3.6, 3.8, and 3.10.
 8. Each Cabinet to have a factory applied, separate and full support toe base construction.
 9. Colors and finishes shall be as selected by Architect.
 10. Casework shall be independently tested to meet the following minimum performance values:

Base Unit Racking	1460 lbf
Base Front Joint Loading	725 lbf
Wall Unit Racking	1600 lbf
Wall Unit Static Load	2500 lbf
Drawer Unit Static Load	1050 lbf
Drawer Front Joint Load	805 lbf
Drawer Side Joint Load	450 lbf
 11. Rail mounted casework shall be vertically and horizontally adjustable.
 12. Rail mounted casework shall have integral lower leveling bar, adjustable from inside of cabinet.
- B. Color and finish selections: Architect reserves the right to select one color for the exposed surfaces of the basic components of cabinets and a different color for the following components of cabinets: door and drawer fronts (including edges of door and drawer fronts), backs of open shelving and countertop and backsplash, unless shown otherwise.

2.3 MATERIALS

- A. Exterior Vertical Surfaces:
1. Door and drawer fronts and backs, finished end panels, and exposed exterior backs shall be surfaced with VGS (0.028") thick high-pressure decorative laminate conforming to NEMA LD3-1995.
 2. Exterior vertical high-pressure laminate panels shall be balanced with textured .020" thick high- pressure cabinet liner conforming to NEMA Standard LD3-1995. Color as selected by Architect. Surface texture shall be similar to exterior finish.
 3. High-pressure laminate must be laminated using a PVA adhesive, set under pressure, resulting in a rigid glue line. Contact adhesives shall not be used.
 4. HPDL at open interiors, underside of wall cabinet bottoms, interiors of glazed door cabinets shall be considered exposed and finished in Decorative High-Pressure VGS laminate.
- B. Plastic Laminate: General purpose grade, HGS (0.048") high pressure decorative laminate meeting requirements of NEMA LD 3. Colors shall be as selected by Architect from full color, finish and pattern range of plastic laminate manufacturers listed. Product/manufacturer; one of the following:
Formica Brand Laminate; Formica Corp.
Nevamar or Pionite Decorative Laminate; Panolam Industries.
Wilsonart; Wilsonart LLC.
- C. Thermally Fused Interiors at Semi-Exposed Surfaces: Interior surfaces behind doors, drawer boxes, backs, and unfinished ends shall be laminated with a thermally fused laminate that meets or exceeds the performance standards for NEMA LD3-1995, Grade VGL, for Test Methods 3.3, 3.4, 3.6, 3.8, and 3.10. Panels shall be of "BALANCED" construction. Fast cycle thermally fused, melamine foil or polyester surfaced panels or other surface types that do not meet these requirements are not acceptable. This excludes backs of doors and drawers, which shall be balanced with VGS (0.028") thick high-pressure decorative laminate conforming to NEMA LD3-1995.
- D. 3mm PVC Edges: Door and drawer edging shall be 3mm PVC. The PVC shall be applied utilizing hot melt adhesive and radiused by automatic trimmers. Hand tool applying and trimming of PVC shall not be allowed. Edging shall be available in TWENTY TWO coordinated color options.

E. Particleboard:

1. Particleboard shall be Grade M-2, Industrial, according to the American National Standard (ANSI) for Mat-Formed Wood Particleboard, ANSI-A208.1-2022 and shall meet or exceed the following:
 - a. Density 45 lbs/cu.ft.
 - b. Moisture Content: Meet or exceed M-2 Grade, according to ANSI-A208.1-2022
 - c. Modulus of Rupture 2176 psi
 - d. Modulus of Elasticity 362,600 psi
 - e. Internal Bond 73 psi
 - f. Linear Expansion 0.40%
 - g. Thickness Tolerance +/- 0.008"
 - h. Face Screw Holding 225 pounds
 - i. Edge Screw Holding 202 pounds

2.4 CASEWORK HARDWARE AND ACCESSORIES

- A. Provide manufacturer's standard, satin finish hardware units, unless otherwise indicated.
- B. Hinges: Institutional type, 5 knuckle. Provide one pair for doors less than 4 ft. high and 1½ pair for doors over 4'. Mill ground hospital tip tight pin feature with edges eased. Hinge to be full wrap around type of tempered steel .095" thick. Each hinge to have minimum 9 #8 screws to assure positive door attachment.
- C. Wire Pulls: Solid brass with dual chrome finish, 4" wide, for drawers and swing doors, mounted with two screws fastened from back. Provide two pulls for drawers over 24" wide.
- D. Door Catches:
1. Dual self-aligning, heavy-duty permanent magnet type with resistance in compliance with the Americans with Disabilities Act and Texas Accessibility Standards. Provide two catches on doors over 4' high.
 2. At double-leaf doors, provide lvs No. 2 catch for leaf without the lock. Four screws per catch.
 3. At each 1-1/8" doors, provide 1 flap stay No. 499.050.02.0215 or 499.050.03.0215 (Mepla) or approved equivalent.
- E. Drawer Slides and Accessories:
1. Standard Drawers: Case DS230, self-closing design, epoxy powder coated with positive in-stop. Captive nylon rollers, front and rear. Minimum 100 lb. load rating.
 2. File Drawers: Case DS430, full extension, 3-part progressive opening slide, minimum 100 lb., zinc plated or epoxy coated at manufacturer's option.
 3. File Drawer Rails: Case FR010, file drawer box shall have full height sides supporting the plastic file rails for hanging file folders.
 4. Paper Storage Drawers: Full extension, 3-part progressive opening slide, minimum 100 lb., zinc plated or epoxy coated at manufacturer's option.
- F. Drawer and Cabinet Locks: Provide National Lock No. C8053-14A, half-mortise type, disc tumbler locks, round cylinder only exposed. Locks to be keyed differently, with locks in individual rooms keyed alike. Provide a masterkey.
- G. Cabinet Base Molding: To be provided by General Contractor in field.
- H. Adjustable Shelf Supports: Provide metal shelf supports. Load rating to be minimum 300 lbs. each support without failure. Cabinet interior sides shall be flush, without shelf system permanent projection.
- I. Wardrobe Rod: To be 1-1/16" rod, Knappe & Vogt No. 660, supported by Knappe & Vogt No. 632 CHR flanges.
- J. Removable Modesty Panel Brackets: At sinks, provide ADA modesty panel brackets from one of the following providers:
Model PRODDLMPBWH; Wurth Wood Group (704-394-9479, www.wurthwoodgroup.com)
ADA EZ-Kick; EZ-Kick (805-748-1652, www.adatoekick.com)
- K. Countertop Support Bracket: Case Systems, Inc. Model X0670
1. 11 gauge construction
 2. Powder-coated finish in color as selected by Architect.
 3. Load rating of 200 lbs. per lineal foot.

- A. Concealed Steel Support Brackets (for countertops): Provide one of the following:
1. Concealed Work Station Brackets formed of 1/8-inch steel with powder coat finish as manufactured by A & M Hardware, Inc. (phone 888.647.0200 web site: www.aandmhardware.com). Color as selected by Architect from manufacturer's full color line.
 2. Concealed Model EH-FM Series Rakks Counter Support Brackets fabricated of minimum 0.25-inch gauge 6063-T6 extruded aluminum as manufactured by Rangine Corp. (phone 800.826.6006 web site: www.rakks.com). Brackets shall be TIG welded along both 45° mitered sides and across the back. Sharp edges shall be ground and deburred. Color and finish shall be as selected by Architect.
- B. Grommets:
1. Grommets: PS-1B - 1-3/4" Flush Mount Desk Grommet, 1 Slot Grommet as manufactured by Doug Mockett & Co., Inc. Color as selected by Architect.

2.5 CONSTRUCTION

- A. Cabinet body components shall be secured utilizing concealed interlocking mechanical fasteners as approved by the "Architectural Woodwork Standards", 2nd Edition, October 1, 2014, as adopted and published jointly by Architectural Woodwork Institute (AWI), Architectural Woodwork Manufacturers Association of Canada (AWMAC), and Woodwork Institute (WI), Section 10 and Appendix A. They shall be especially designed for use in joining particleboard panels.
- B. Joints are tight fitting and will not rupture or loosen due to the following:
1. Dimensional changes in the particleboard.
 2. Racking of casework during shipment and installation.
 3. Normal use.
 4. Fastening devices and screws shall be treated to deter or resist corrosion.
- C. Construction Features:
1. Structural components shall be 3/4" thick with balanced surfaces.
 2. Back panels shall be 1/2" thick surfaced both sides for balanced construction.
 3. Drawer components shall be 1/2" thick surfaced both sides for balanced construction.
 4. Mounting stretchers are 3/4" thick structural components fastened to end panels by mechanical fasteners, and are concealed by the cabinet back.
 5. Maintain a 1/8" max. reveal between pairs of doors, between door and drawer front, or between multiple drawer fronts within the cabinet.
 6. When the rear of cabinets are exposed, a finished 3/4" thick decorative laminate back panel is applied.
 7. Exterior grade plywood core individual bases, factory applied to base and tall cabinets shall support and carry the load of the end panels, and the cabinet bottom, directly to the floor. The base shall be let in from the sides and back of the cabinet to allow cabinets to be installed tightly together and tight against a wall. Also to conceal the top edge of applied rubber base molding. There shall be a front to back center support for bases over 30" wide.
 8. Horizontal parting rails between drawers shall be 3/4" particleboard with balanced surfaces, secured to and further reinforcing cabinet ends. When drawers are keyed individually within a cabinet, or when drawers are fitted with lock hasps, the parting rail shall run full depth of cabinet to prevent pilfer.
 9. A 5mm diameter row hole pattern 32mm (1-1/4") on center shall be bored in cabinet ends for adjustable shelves. This row hole pattern shall also serve for hardware mounting and replacement and/or relocation of cabinet components.
 10. Door and drawer fronts and finished ends shall be balanced construction with "high-pressure" laminate bonded to both sides of a M-2, 45# particleboard core.
 11. Doors over 24" wide or 80" high shall be 1" thick.
 12. Adjustable shelves shall be particleboard core, balanced surfaces and have a .020" thick PVC front edge. Per AWS, shelving shall not deflect in excess of 1/4" when loaded.
 - a. Adjustable shelves behind doors, 3/4" thick to 27" wide, over 30" wide shall be 1" thick min.
 - b. Adjustable shelves in open cabinets shall be 1" thick, except for special use cabinets such as mail, cubical or locker type units.
 - c. There shall be no play in adjustable shelves 1/16" each end, max.
 13. Fixed Interior Components such as fixed shelves, dividers, and cubicle compartments shall be full 3/4" thick particleboard attached with concealed interlocking mechanical fasteners.
- D. Wall Cabinets:
1. Each end panel to be secured with a minimum of seven interlocking mechanical fasteners for a total tensile strength of 2,450 pounds.
 2. Wall cabinet bottoms shall be of 1" thick particleboard core mechanically fastened to end panels and secured to the bottom back stretcher.

3. An upper 3/4" thick stretcher shall be located behind the back panel with two interlocking mechanical fasteners per end. Also the stretcher is secured to the cabinet top with #8 x 2" plated flat head screws.
 4. A lower 3/4" thick stretcher shall be located behind the back panel and attached to the end panels with interlocking mechanical fasteners. The stretcher is also secured to the cabinet bottom.
- E. Base Cabinets:
1. Each end panel to be secured with a minimum of seven interlocking mechanical fasteners for a total tensile strength of 2,450 pounds.
 2. Base cabinets, except sink cabinets, shall have a solid 3/4" thick sub-top fastened to the ends with interlocking mechanical fasteners.
 3. Each kneespace to have apron with dimensions per drawings.
 4. Provide 1-1/2" thick dividers between kneespaces and adjacent spaces (e.g. dishwasher openings, other kneespaces, etc.)
 5. Sink cabinets shall have a vertically mounted front stretcher panel supporting the countertop, a split removable back panel, and four steel corner gussets used to secure the counter-top.
 6. An upper 3/4" thick stretcher shall be located behind the back panel and attached to the end panels with interlocking mechanical fasteners. This stretcher is also fastened to the full sub-stop thus capturing the back panel.
 7. Sub-Base: Each cabinet to have a factory applied, continuous, separate and fully supportive toe base construction (no cabinet body sides-to-floor) with concealed fastening to cabinet bottom. Subbase shall be recessed at sides of end cabinets for rubber base installation.
- F. Drawers:
1. Drawer box shall be constructed with a full 1/2" thick non-racking, non-deflecting platform bottom which is carried directly by "L" shaped, bottom mount drawer glides. Sides are secured with 1 1/4" long screws directly into platform and into the sides.
 2. Sides, back, sub-front and bottom shall be 1/2" thick 47# density particleboard surfaced both faces with Light Beige, Greystone, or White thermally fused laminate per 2.02.B.1. The top edge shall be .020" PVC matching the drawer color.
 3. Corners shall be joined with fluted hardwood dowels and glue, minimum 32mm o/c.
 4. Drawer fronts shall be removable and attached drawer box sub-front with screws from inside of drawer.

2.6 PERFORMANCE

- A. Laminates:
1. "High Pressure Laminates" shall meet the definition and performance requirements of NEMA LD3-1995. Vertical grade laminate shall be VGS (0.028") balanced with a VGS. Countertops shall be HGS (0.048").
 2. Thermally Fused Laminate shall meet the performance requirements of NEMA LD3-1995, Grade VGL, for Test Methods 3.3, 3.4, 3.6, 3.8, and 3.10. Cabinet manufacturer shall submit panel manufacturers' current published specification stating ANSI core properties and NEMA finish properties.
- B. Hinges: ANSI 156.9.4.1,2,3,4: Two hinges mounted 23" on center on a 23-7/16" wide x 19-11/16" high cabinet door shall be capable of supporting a 100 pound test load located 1" from the outside edge of the door.
1. Cycle, open and close, from 5 degrees open through 95 degrees open with no failure to hinges, door, or cabinet end panel. The maximum horizontal permanent hinge set shall not exceed .030".
- C. Drawers: ANSI/BHMA A156.9-1988 4.11: an actual production drawer box with an applied finished front and 450mm drawer slides mounted per the manufacturers' instructions shall be tested as follows:
1. Dynamic Cycle Test: When uniformly loaded with 100 pounds and tested through 50,000 opening and closing cycles, the drawer shall operate freely.
 2. Static Edge Load Test: When the drawer is fully extended, a 150 pound load shall be supplied to the drawer front at a point on the centerline of the drawer for one minute. No permanent damage or distortion shall occur.
- D. Adjustable Cabinet Shelving: Shelving shall not deflect in excess of 1/4" when loaded with calculations per AWS Standards.

2.7 COUNTERTOPS

- A. Solid Surfacing Countertops: Basis of Design shall be Gibraltar Solid Surfacing as manufactured by Wilsonart or Corian Surfaces as manufactured by DuPont. Refer to "Material Finish schedule" in drawings.
1. AWS Premium Grade.
 2. Substrate: Marine grade plywood.

3. Fabricate to detail using 1/2-inch thick solid surfacing.
4. Use seam adhesive and color-matched sealant by manufacturer.
5. Color shall be as selected by Architect from full range of manufacturer colors.
6. Edge Treatment: PVC edging will not be acceptable. Reference installation for edge treatment required.

2.8 WINDOWSILLS

- A. Solid Surfaced Windowsills: Fabricate the windowsill to detail using solid surfacing panels as manufactured by Staron. Use seam adhesive and color-matched sealant by manufacturer. Finish and color will be as scheduled in the "Material Finish Schedule" in drawings.

2.9 FABRICATION

- A. Fabricate plastic laminate-faced casework to dimensions, profiles and details shown.
- B. Assemble units in the shop in as large components as practicable to minimize field jointing.
- C. Install hardware uniformly and precisely after final finishing is complete. Set hinges snug and flat in mortises unless otherwise indicated. Turn screws to a flat seat. Adjust and align hardware so that moving parts operate freely and contact points meet accurately. Allow for final field adjustment after installation.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Verify site dimensions of cabinet locations in building prior to fabrication.
- B. Verify location of wood blocking prior to installation of finish carpentry.

3.2 CASEWORK INSTALLATION

- A. Installers: Install casework under the supervision of the manufacturer's representative with factory-trained mechanics certified by manufacturer.
- B. General: Install plumb, level, true and aligned with no distortions. Shim as required, using concealed shims. Where casework abuts other finished work or walls, scribe and apply filler strips for accurate fit with fasteners concealed where practicable.
- C. Base Cabinets:
 1. Set cabinets straight, plumb and level. Adjust sub-tops within 1/16" of a single plane. Fasten each individual cabinet to blocking in wall with screws and finishing washers spaced 24" o.c. Bolt adjacent cabinets together into one integral unit with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16".
 2. Where base cabinets are not installed adjacent to walls, fasten to floor at toe space with fasteners spaced 24" o.c. Secure sides of cabinets to floor, where they do not adjoin other cabinets, with not less than two fasteners.
- D. Wall Cabinets
 1. Securely fasten to solid blocking in partitions (not plaster, lath, or wallboard). Anchor, adjust and align wall cabinets as specified for base cabinets. Using screws with finishing washers, securely fasten each cabinet through back, near top, at not less than 24" o.c. Align similar adjoining doors to a tolerance of 1/16".
 2. Adjust fronts and bottoms within 1/16" of a single plane.
 3. Reinforcement of stud walls to support wall-mounted cabinets will be done during wall erection by trade involved, but responsibility for accurate location and sizing of reinforcement is part of this work.
- E. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

3.3 INSTALLATION OF TOPS

- A. Field Jointing: Where practicable, make in same manner as factory jointing using dowels, splines, adhesives and fasteners recommended by manufacturer. Locate field joints as shown on accepted shop drawings, factory prepared so there is no jobsite processing of top and edge surfaces.
- B. Fastenings: Use concealed clamping devices for field joints, located within 6" of front, at back edges and at intervals not exceeding 24". Tighten in accordance with manufacturer's instructions to exert a constant, heavy clamping pressure at joints. Secure tops to cabinets with "Z"-type fasteners or equivalent, using two or more fasteners at each front, end and back.
- C. Workmanship:
 - 1. Abut top and edge surfaces in one true plane, with internal supports placed to prevent deflection. Provide flush hairline joints in top units using clamping devices.
 - 2. After installation, carefully dress joints smooth, remove surface scratches, clean and polish entire surface.
 - 3. Provide holes and cutouts as required for mechanical and electrical service fixtures.
 - 4. Provide scribe moldings for closures at junctures of top, curb and splash with walls as recommended by manufacturer for materials involved. Use permanently elastic sealing compound recommended by manufacturer.

3.4 INSTALLATION OF ACCESSORIES

- A. Install in a precise manner in accordance with manufacturer's directions. Turn screws to a flat seat; do not drive. Adjust moving parts to operate freely without excessive bind.
- B. Install grommets at knee spaces where electrical/telephone/data outlets are installed below countertop, whether detailed on drawings or not.

3.5 CLEANING AND PROTECTION

- A. Clean Up: Remove cartons, debris, sawdust, scraps, etc., and leave spaces clean and casework ready for Owner's use.
- B. Repair or remove and replace defective work as directed upon completion of installation.
- C. Clean shop-finished surfaces, touch-up as required and remove or refinish damaged or soiled areas, as acceptable to Architect.
- D. Protection: Advise contractor of procedures and precautions for protection of materials and installed plastic laminate-faced casework from damage by work of other trades.

END OF SECTION

SECTION 12 35 53.13

STEEL LABORATORY CASEWORK AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fabricating, delivering, and installing the laboratory casework and equipment shown and scheduled on the drawings and specified in this section.
 - 2. Furnishing, delivering to the building, un-crating, setting in place and leveling casework and equipment.
 - 3. Furnishing plumbing fixtures and fittings as defined in the specifications and shown on drawings.
 - 4. Furnishing electrical service fixtures directly attached to the casework or equipment as called for in the specifications and shown on drawings. Fixtures shall be furnished and set in place in equipment as required by drawings. Plug mold housing and cover plates shall be furnished and installed.
 - 5. Furnishing of sink bowls and cup sinks, complete with required overflows, plugs, strainers and tailpieces with couplings, as called for in the specifications, and shown on drawings. Traps, above floor, shall be furnished with, support, tailpiece, trap/drum, and overflow and set inside the casework.
 - 6. Furnishing filler panels and scribes as required.
- B. Related Sections:
 - 1. Section 06 10 00 - Rough Carpentry; wood blocking.
 - 2. Section 09 65 00 - Resilient Flooring; coved rubber base.
 - 3. Section 11 31 00 - Appliances.
 - 4. Division 22 - Plumbing; Furnishing and installation of plumbing utilities and final connections to plumbing fixtures.
 - 5. Division 26 - Electrical connections to equipment; Furnishing and installation of electrical utilities and final connections to plumbing fixtures.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Furnishing, installing and connecting of service lines, drain lines, piping, system vacuum breakers and conduit within equipment, in service turrets or tunnels, through, under or along the backs of working surfaces. Caulking in the tailpieces and sinks; furnishing and installing adapters and drain lines.
- B. Furnishing and installing rigid or flexible conduit, wire, pulling of wire, fittings and special electrical equipment and accessories. This includes light and a blower switches and cover plates.
- C. Providing framing and reinforcements of walls, floors, and ceilings necessary to adequately support the equipment, and bucks and plaster grounds required for proper installation of equipment.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Laboratory casework and equipment shall be of the quality manufactured by Kewaunee Scientific Corporation, Inc.,
 - 1. Casework items are referred to by Kewaunee Lab catalog numbers for convenience in identification.
 - 2. The use of a catalog number as part or all of the description of an item shall be taken to include any description or specification of the item in the manufacturers.
 - 3. If there are contradictions or variations in the catalog descriptions, the better quality or greater quantity of workmanship or material described shall be furnished.
 - 4. The casework, together with associated equipment, shall be furnished from one source to assure matching of finishes and compatibility of design.
 - 5. Casework shall be furnished by a manufacturer which has repair and replacement parts readily available for the Owner to secure. Source of repair/replacement parts shall be provided to the Owner.

- B. Allowable Tolerances: Casework shall completely fill the spaces as detailed, and the casework items and the rooms are dimensioned accordingly. Fillers and like devices which provide no usable cabinet space shall be kept to a minimum.
 - 1. Verify the dimensions of each unit with the plan elevations and details. No variations from the dimensions shown on the plans will be permitted without written approval of the Architect.
 - 2. Take necessary field measurements and verify project conditions as required for the correct fabrication and installation of this work.
- C. Accessibility Standards: The following special requirements shall be met, where required to comply with Texas Accessibility Standards (TAS).
 - 1. Countertop height with or without cabinet below, not to exceed a height required by TAS.
 - 2. Knee space clearance to be minimum clearance as required by TAS.
 - 3. 12" deep shelving, adjustable or fixed not to exceed a range as required by TAS.
 - 4. Wardrobe cabinets to be furnished with rod/shelf adjustable to 48" A.F.F. at a maximum 21" shelf depth.
 - 5. Sink cabinet clearances as required by TAS.
 - 6. Cabinet locks, latches, and other operating mechanisms shall be mounted to comply with forward reach requirements of TAS; i.e. 15" to 48" above finish floor, except locked bottom drawers at base cabinets.

1.4 SUBMITTALS

- A. Shop Drawings: Submit in accordance with Section 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, SAMPLES. Submit detailed shop drawings prior to fabrication of any casework.
 - 1. Shop drawings shall show the following:
 - a. Layout of casework and relationship to adjacent construction.
 - b. Construction features, exact dimensions, finishes, hardware, and the like.
- B. Roughing-in Drawings: Submit in accordance with Section 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, SAMPLES. Rough-in drawings shall show dimensioned locations of electrical and plumbing stub-outs.
- C. Samples: Submit in accordance with Section 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, SAMPLES. Samples may be required by the Architect before proceeding with any of the work. Such samples must clearly show the following:
 - 1. Top construction.
 - 2. Drawer construction.
 - 3. Corner and leg construction.
 - 4. Cabinet construction.
 - 5. Door construction.
 - 6. Finish.
 - 7. Hardware.
 - 8. Plumbing fixtures.
- D. Finish Samples: Submit 3 x 3 inch samples of each color of finish for casework, work surfaces and for other pre-finished equipment and accessories for selection by Architect.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle casework and accessories in a manner to prevent damage and deterioration.
 - 1. Provide protective packaging and containers.
 - 2. Store in a protected dry area, and follow special handling requirements of the manufacturer.
 - 3. Schedule delivery of equipment so that spaces are sufficiently complete that equipment can be installed immediately following delivery.
 - 4. Protect finished surfaces from soiling or damage during handling and installation. Keep covered with polyethylene film or other protective coating.
 - 5. Protect work surfaces throughout construction period with 1/4" corrugated cardboard completely covering the top and securely taped to edges. Mark cardboard in large lettering "No Standing".

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Materials and methods described are based on the specifications of Kewaunee Scientific Corp. (phone 704.873.7202 web site: www.kewaunee.com), Overlay – Square Edge and are given to designate the quality of materials and workmanship required or approved equal.
- B. Sheet steel: Mild, cold rolled and leveled unfinished steel.
- C. Minimum gauges:
 - 1. 20 gauge: Exterior/interior drawer fronts, interior door panels, scribing strips, filler panels, enclosures, drawer bodies, shelves, security panels and sloping tops.
 - 2. 18 gauge: Door fronts, case tops, ends, bottoms, bases, backs, vertical posts, uprights, and access panels.
 - 3. 16 gauge: Top front rails, top rear gussets, intermediate horizontal rails, table legs and frames, leg rails and stretchers.
 - 4. 14 gauge: Drawer suspensions, door and case hinge reinforcements and front corner reinforcements.
 - 5. 11 gauge: Table leg corner brackets and gussets for leveling screws.

2.2 CASEWORK FABRICATION

- A. Base Units, Wall, and Upper Cases:
 - 1. Base units - 33" (ADA) and 36" standing height and 30" sitting height. End panels and back reinforced with internal reinforcing front and rear posts. Base units shall be 22" overall in depth.
 - 2. Wall and Tall Cases - 25", 31", 36", 49 13/32" and 84 5/8". Formed end panels with front and rear reinforcing post channels; back shall be formed steel panel, recessed 3/4" for mounting purposes.
 - 3. Posts: Front post fully closed with full height reinforcing upright. Shelf adjustment holes in front and rear posts shall be perfectly aligned for level setting, incrementally adjustable to 1/2" on-center full height of unit.
 - 4. Secure intersection of case members with spot and arc welds. Provide gusset reinforcement at front corners.
 - 5. Base unit backs: Provide drawer units without backs and cupboard units with removable backs for access to services behind units.
 - 6. Bottoms: Base units and 25", 31", 37" and 49" high wall and upper cases shall have one piece bottom with front edge formed into front rail, rabbeted as required for swinging doors and drawers and flush design for sliding doors.
 - 7. Top rail for base units: Interlock with end panels, flush with front of unit.
 - 8. Horizontal intermediate rails: Recessed behind doors and drawer fronts.
 - 9. Base for base units: 4" high x 3" deep with formed steel base and 11 gauge die formed steel gussets at corners. Provide 3/8" diameter leveling screw with integral bottom flange of minimum 0.56 sq. in. area at each corner, accessible through openings in toe space.
 - 10. Tops of wall and upper cases: One piece, with front edge formed into front rail.
 - 11. Back Panels shall be removable to access plumbing chase and open behind drawer. Back panel shall match adjacent surfaces
- B. Drawers:
 - 1. Steel Drawer Fronts: 3/4" thick, double wall steel construction, prepainted prior to assembly and sound deadened.
 - 2. Drawer bodies: Bottom and sides formed from one-piece, cold rolled steel with bottom and sides coved and formed top edges. Front and back panels spot welded to center section.
 - 3. Drawer suspension: Heavy duty coved raceways for both case and drawer with nylon tired, ball bearing rollers; self-centering and self-closing when open to within 3" of the closed position.
 - 4. Provide drawer with rubber bumpers. Friction centering devices are not acceptable.
 - 5. Provide security panels for drawers with keyed different locks.
 - 6. File drawers: Provide with 150# full extension slides for full access and operation.
- C. Doors:
 - 1. Steel Solid Panel Doors: 3/4" thick, double wall, telescoping box steel construction with interior prepainted and sound deadened. Reinforce interior of front panel with welded steel hat channels. Hinges with screws to internal 14 gauge reinforcing in case and door. Hinges shall be removable; welding of hinges not acceptable. Doors shall close against rubber bumpers.
- D. Drawers:
 - 1. Drawer bodies: Bottom and sides formed into one-piece center section with bottom and sides coved

- (1/4" minimum) and formed top edges. Front and back panels spot welded to center section.
2. Drawer suspension:
 - SEFA 8 Laboratory 100 lb. Load – coved raceways for case and drawer with nylon tied, ball bearing rollers; self-centering and self-closing when open within 3" of the closed position. Tested to full extension for 50,000 cycles at a rate not to exceed 10 cycles per minute without failure or permanent deformation.
 - File drawers: provide with 150 lb. full extension slides for full access and operation.
 3. Provide drawer with rubber bumpers. Friction centering devices are not acceptable.
 4. Provide security panels for drawers with keyed different locks.
- E. Shelves:
1. Form front and back edges down and back 3/4". Form ends down 3/4".
 2. Reinforce shelves over 30" long with welded hat channel reinforcement the full width of shelf.
 3. Pull out shelves: Same suspension as specified for drawers.
- E. Base molding: 4" high, to be furnished and installed by flooring contractor.
- F. Corner base guards: 4" high #304 stainless steel corner guards.
- G. Hardware: Drawer and hinged door pulls.
Pull Direction at Drawers and Doors
1. Horizontal on drawers, vertical on doors.
 - a. Door/Drawer Pulls – Stainless steel wire finger
 2. Hinges: Institutional type, five knuckle projecting barrel hinges, minimum 2-1/2" long, type 304 stainless steel. Provide two hinges for doors up to 36" high; three hinges for doors over 36" high. Drill each leaf for three screw attachment to door and frame.
 3. Door catches:
 - a. Adjustable type, spring actuated nylon roller catches.
 - b. Non-metallic plunger catch (acid storage only)
 4. Elbow catches: Spring type of cadmium plated steel, with strike of suitable design.
 5. Locks: National Lock Remove-A-Core 5-pin tumbler, heavy duty cylinder type. Exposed lock noses shall be dull nickel (satin) plated and stamped with identifying numbers.
 6. Keying: Locks at all cabinets shall have capacity for 225 primary key changes. Master key one level with the potential of 40 different, non-interchangeable master key groups.
 7. Keys: Stamped brass available from manufacturer or local locksmith, and supplied in the following quantities unless otherwise specified:
 - 2 for each keyed different lock.
 - 3 for each group keyed alike locks.
 - 2 for master keys for each system.
 8. Shelf clips: Die formed steel, zinc plated, designed to engage in shelf adjustment holes. Seismic rated shelf clips.

2.3 METAL FINISH

A. Metal Finish

1. Preparation: Spray clean metal with a heated cleaner/phosphate solution, pre-treat with iron phosphate spray, water rinse, and neutral final seal. Immediately dry in heated ovens, gradually cooled, prior to application of finish.
2. Application: Electrostatically apply urethane powder coat of selected color and bake in controlled high temperature oven to assure a smooth, hard satin finish. Surfaces shall have a chemical resistant, high grade laboratory furniture quality finish of the following thickness: Liquid, dipped, solvent based finishes are not and will not be acceptable.
 - a. Exterior and interior exposed surfaces: 1.5 mil average and 1.2 mil min.
 - b. Backs of cabinets and other surfaces not exposed to view: 1.2 mil average.

2.4 COUNTERTOPS

- A. Countertops, General: Provide units with smooth surfaces in uniform plane free of defects. Make exposed edges and corners straight and uniformly beveled. Provide front and end overhang of 1 inch, with continuous drip groove on underside 1/2 inch from edge.
- B. Epoxy Countertops: Factory molded of modified epoxy-resin formulation with smooth, nonspecular finish.
1. Physical Properties:
 - a. Flexural Strength: Not less than 10,000 psi.
 - b. Modulus of Elasticity: Not less than 2,000,000 psi.

- c. Hardness (Rockwell M): Not less than 100.
- d. Water Absorption (24 hours): Not more than 0.02 percent.
- e. Heat Distortion Point: Not less than 260°F.
- 2. Color to be selected from manufacturer's full range of color options.
- 3. Countertop Fabrication: Fabricate with factory cutouts for sinks and with butt joints assembled with epoxy adhesive and prefitted.
- 4. Countertop Configuration: Flat, 1 inch thick, with beveled edge and corner, and with drip groove and 4" high epoxy-resin applied curb backsplash where base cabinets, tables, and workstations are adjacent to a wall.
- 5. Countertop Construction: Uniform throughout full thickness.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install laboratory casework and equipment in accordance with the manufacturer's recommendations.
 - 1. Secure the work in a rigid substantial manner, straight and plumb, and with horizontal surfaces level and in proper alignment.
 - 2. Make the casework and accessories ready for use once the service connections have been made.
 - 3. Cooperate with and assist other trades concerned with the installation.

3.2 ADJUST AND CLEAN

- A. Adjusting: Adjust doors, drawers and other operating parts, and leave in perfect working order.
- B. Cleaning: Upon completion of the work, clean the casework and accessories.
 - 1. Clean stainless steel with an organic solvent such as carbon tetrachloride, and follow with warm, soapy water. Rinse thoroughly with clean water and wipe dry with soft cloths.
 - 2. Leave the work clean and free of defects.

END OF SECTION

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SECTION 12 36 16

STAINLESS STEEL COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Stainless-steel countertops.

1.2 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded wall-mounted shelves.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For metal fabrications.
 - 1. Include plans, sections, details, and attachments to other work. Detail fabrication and installation, including field joints.
 - 2. For countertops, show locations and sizes of cutouts and holes for items installed in metal countertops.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products only after casework and supports on which they will be installed has been completed in installation areas.
- B. Keep finished surfaces of products covered with polyethylene film or other protective covering during handling and installation.

1.5 FIELD CONDITIONS

- A. Field Measurements: Where products are 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.
- B. Established Dimensions: Where products are indicated to fit to other construction, establish dimensions for areas where products are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 STAINLESS-STEEL FABRICATIONS

- A. Countertops: Fabricate from 0.062-inch thick, stainless-steel sheet, with ASTM A480/A480M No. 4 satin finish. Provide smooth, clean exposed tops and edges in uniform plane, free of defects. Provide front and end overhang of 1 inch over the base cabinets.
 - 1. Joints:
 - a. No joints shall occur on the top surface or the front edge of the countertop.
 - b. Fabricate countertops without field-made joints. Where field-made joints are required, provide hairline butt joints mechanically bolted through continuous channels welded to underside at edges of joined ends. Keep field jointing to a minimum.
 - c. Weld shop-made joints.
 - 2. Extend the top down to provide a 1-inch thick edge with a 1/2-inch return flange.
 - 3. Form backsplash coved to and integral with top surface with a 1/2-inch thick top edge.
 - 4. After fabricating and welding, grind surfaces smooth and polish to produce uniform, directionally textured finish with no cross scratches or evidence of welds. Passivate and rinse surfaces; remove embedded foreign matter and leave surfaces clean.

- B. Vertical Surfaces: Fabricate from stainless-steel sheet, not less than 0.050-inch nominal thickness, fabricate without field-made joints.

2.2 MATERIALS

- A. Stainless-Steel Sheet: ASTM A240/A240M, Type 304.
- B. Grind and polish surfaces to produce uniform, directional satin finish matching No. 4 finish, with no evidence of welds and free of cross scratches. Run grain with long dimension of each piece. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces clean.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install metal countertops level, plumb, and true over cabinet wood substrate; shim as required, using concealed shims.
- B. Install vertical metal components, plumb, flat, and true over cabinet wood substrate; shim as required, using concealed shims.
- C. Secure countertops and vertical metal components with a full bed of high strength construction adhesive compatible with both wood and metal surfaces for a secure and permanent bond.

3.3 CLEANING AND PROTECTION

- A. Repair or remove and replace defective work as directed on completion of installation.
- B. Clean finished surfaces. Remove and replace damaged products or touch up and refinish damaged areas to match original factory finish, as approved by Architect.
- C. Protection: Provide 6-mil plastic or other suitable water-resistant covering over countertop surfaces. Tape to underside of countertop at a minimum of 48 inches o.c. Remove protection at Substantial Completion.

END OF SECTION

SECTION 12 93 00

SITE FURNISHINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Provide and install the following:
 - 1. Handicapped parking signs.
 - 2. Traffic directional signs.
 - 3. Removable Pipe Bollards.
- B. Related Sections:
 - 1. Section 32 13 13 - Concrete Paving.

1.2 SUBMITTALS

- A. Product Data: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. Include catalog, cuts of each type of sign and manufacturer's installation instructions.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle signs in accordance with SECTION 01 65 00 - PRODUCT DELIVERY REQUIREMENTS and SECTION 01 66 00 - PRODUCT STORAGE AND HANDLING REQUIREMENTS and in manufacturer's cartons. Store off ground on planking. Cover with non-staining plastic.

1.4 PROJECT CONDITIONS

- A. Coordinate installation of site furnishings with work of other trades.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Site signs: As manufactured by Sa-So (Sargent-Sowell, Inc.) 1185 108th Street, Grand Prairie, Texas 75050 (phone 647-1525), or approved equivalent.
 - 1. General: Site signs shall be of the quality manufactured by Sa-So and are listed by Sa-So catalog numbers for convenience in identification.
 - 2. Aluminum Sheets: ASTM B 209, alloy 6061 T6, degreased and etched, 0.080" thickness. Sign faces shall be fully reflectorized with material conforming to Mil. Spec. MIL-R-13689A.
 - 3. Bolts, Nuts, Washers, and Clamps: Cadmium or galvanized steel. Bolts shall be a minimum of 5/16" in diameter. Clamps shall be two-piece assemblies of at least 14 gage steel or shall be an adjustable steel strap bracket.
 - 4. Posts: Standard galvanized steel pipe 2 3/8" in diameter and weighing not less than 2 lbs. per linear foot.
 - 5. Concrete: Provide concrete consisting of Portland cement (ASTM C 150), aggregates (ASTM C 33), and clean water. Mix materials to obtain concrete with a minimum 28-day compressive strength of 2500 psi, using at least 4 sacks of cement per cubic yard, 1" maximum size aggregate, maximum 3" slump, and 2% to 4% entrained air.
- B. Embedded Removable Domed Pipe Bollards: Provide Model "2190-RH Timberform", with 1/4" steel lock has welded to bottom of bollard, padlock receiver with lid to cover the empty embedment sleeve, round 4" i.d., Schedule 40, steel pipe bollards as manufactured by Columbia Cascade Company (1-800-547-1940), or one of the following manufacturers:
 - Cal Pipe Manufacturing (1-800-536-2248)
 - Columbia Cascade Company (1-800-547-1940)
 - Ironsmith (1-800-338-4766)
 - 1. Fabrication: 4-inch ID, 4/32-inch wall, Schedule 40 steel pipe. 1" schedule 40 steel pipe permanently welded to bottom.
 - 2. Height: Reference drawings.
 - 3. Top: Domed.
 - 4. Mounting: Removable embedded, pad lockable.

SITE FURNISHINGS

5. Finish: Hot-dipped galvanized.
6. Accessories: Pad lockable or integral hole covers for removable bollards.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Site Sign Materials:
 1. Excavation: Drill holes of the size indicated for posts. Excavate holes to the depths indicated. Remove excess concrete and excavated soil from the site.
 2. Setting Posts:
 - a. Remove loose and foreign materials from sides and bottoms of holes and moisten soil prior to placing concrete. Center and align posts in holes.
 - b. Place concrete around posts in a continuous pour and vibrate or tamp for consolidation. Check each post for vertical and top alignment and hold in position during placement and finishing operations. Trowel finish tops of footings, and slope or dome to direct water away from posts.
 3. Attach signs to posts with bolts, washers, nuts and clamps.

3.2 CLEANING

- A. Clean exposed sign faces and galvanized surfaces, and leave free of defects. Use no abrasives. Leave pavement and graded area clean and free of debris.

END OF SECTION

SECTION 13 34 16.53

FRAME-TYPE BLEACHER

PART 1 - GENERAL

1.1 SYSTEM DESCRIPTION

- A. Design and fabrication of Bleacher Seats.

1.2 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer must have ten years of experience in the manufacture of bleachers and grandstands; welders must be AWS certified.
- B. Source Quality Control: Mill Test Certification.

1.3 WARRANTY

- A. Provide manufacturer's 5-year warranty from date of Substantial Completion. Manufacturer agrees to repair or replace components of bleacher that fail in materials or workmanship. Failures include, but are not limited to:
 - 1. Structural failures, including all components.
 - 2. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

PART 2 - PRODUCTS

- 2.1 Provide bleacher seats as manufactured by Southern Bleacher Co. (phone 800.433.0912 website: www.southernbleacher.com). Subject to compliance with requirements of this specification, equivalent product as manufactured by one of the following will be acceptable:
 - Outdoor Aluminum, Inc. (800-225-4249, website www.outdooraluminum.com)
 - Sturdisteel (800-433-3116; website: www.sturdisteel.com)

2.2 BLEACHER SEATS

- A. Seats: Nominal 2 x 10 anodized aluminum plank with 2 x 10 anodized end caps.
- B. Materials/Finishes
 - 1. Extruded Aluminum:
 - a. Seat Planks: Extruded aluminum alloy 6063-T6, clear anodized 204R1, AA-M10C22A31, Class II, and a wall thickness of .094".
 - 2. Accessories:
 - a. Stanchions:
 - 1) Stanchions shall be die cast aluminum providing for rust free standards.
 - 2) Riser mounted stanchions shall accommodate a minimum of 8" to a maximum of 24" rise without additional attachment plates.
 - 3) Each stanchion shall be designed to maintain proper and constant seat level.
 - 4) Stanchions shall be designed in such a manner that all integral protrusions shall shed liquids.
 - b. Channel and Plank End Caps: Aluminum alloy 6063-T6, clear anodized 204R1, AA-M10C22A31, Class II.
 - c. Hardware:
 - 1) Bolts, Nuts: Galvanized or plated.
 - 2) Hold Clip Assembly: Aluminum alloy 6061-T6.
- C. Fabrication
 - 1. Design Load:
 - a. Live Load of Seat: 120 plf.
 - 2. All connections made in shop to be shop welded.
 - a. Manufactured by certified welders conforming to AWS Standards.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install bleacher seat unit and associated hardware in accordance with manufacturer's installation procedures.
- B. Install per approved shop drawings.
- C. Bleacher unit shall be securely anchored flat and level.

3.2 CLEAN-UP

- A. Clean up all debris caused by work of this section.

END OF SECTION

SECTION 13 34 19

METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Pre-engineered building system including the structural steel system primary and secondary per Design Criteria, metal roof system, canopy, wall system and all roof and wall insulation, trim and accessories as required.
- B. Related Sections:
 - 1. Section 03 30 00 - Cast-in-place Concrete
 - 2. Section 05 50 00 - Metal Fabrications; structural frames for overhead doors
 - 3. Section 08 33 23 - Overhead Coiling Doors
 - 4. Section 08 41 13 - Aluminum Framed Entrances and Storefronts
 - 5. Section 09 91 00 - Painting; field painting exposed structure
 - 6. Division 21 - Fire Suppression; piping and supports
 - 7. Division 22 - Plumbing; piping and supports
 - 8. Division 23 - Heating, Ventilating, and Air Conditioning (HVAC); ductwork and supports
 - 9. Section 31 23 33 - Trenching and Backfilling
 - 10. Section 31 63 29 - Drilled Concrete Piers

1.2 SUBMITTALS

- A. Shop Drawings: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. Include complete erection drawings showing anchor bolt sizing, patterns and embedment lengths from datum, sidewall, endwall and roof framing, transverse cross sections, panel layout, flashing and trim details, and foundation loads.
- B. Samples: Submit in accordance with SECTION 01 33 23 - SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. Submit a 12" long by actual width sample of roofing and siding panels, with required finish.
- C. Letter of Certification: Submit written Certification prepared and signed by a Professional Engineer, registered to practice in the State of Texas, verifying that building design and metal roof system (including panels, clips and support system components) meet indicated loading requirements and codes of authorities having jurisdiction. The certification must reference specific dead loads, live loads, snow loads, wind loads/speeds, tributary area load reductions (if applicable), concentrated loads, collateral loads, seismic loads, end use categories, governing code bodies including year and load applications.
- D. Welders Certification: Provide copy of welder's certification. Welders must show proof of certification/qualification prior to starting any welding on the project.

1.3 QUALITY ASSURANCE

- A. Design Criteria:
 - 1. Design of metal building systems shall be based upon both strength and deflection requirements. These requirements shall meet the more stringent of the 2021 IBC or the criteria listed herein.
 - 2. Structural Framing: Design primary and secondary structural members and exterior covering materials for applicable loads and combinations of loads in accordance with the Metal Building Manufacturer's Association's (MBMA) "Design Practices Manual" and applicable Building Code.
 - 3. Structural Steel: Comply with the requirements of the American Institute of Steel Construction's (AISC) "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" for design requirements and allowable stresses.
 - 4. Light Gage Steel: Comply with the requirements of the American Iron and Steel Institute's (AISI) "Specifications for the Design of Cold Formed Steel Structural Members" and "Design of Light Gage Steel Diaphragms" for design requirements and allowable stresses.
 - 5. Welders must show proof of certification/qualification prior to starting any welding on the project. For welded connections, comply with the American Welding Society's (AWS) "Standard Code for Arc and Gas Welding in Building Construction" for welding procedures. Welding procedure and operator qualifications and welding quality standard shall be in accordance with the American Welding Society structural welding code.

Inspection other than visual inspection as defined by AWS, Paragraph 8.15.1, shall be identified and negotiated prior to bidding.

6. Roof Live Load = 20 psf with code-allowable area reductions.
7. Total Roof Dead Load and Collateral Load = 5 psf plus frame weight.
8. Roof purlins shall be capable of supporting concentrated loads such as mechanical loads, sprinkler loads, sectional overhead doors.
9. Wind Load = 120 mph, Exposure C.
10. Building Drift = Limited to H/400 at masonry.
11. Metal roof panels shall not provide a diaphragm or lateral stability for purlins.
12. Roof Panel System shall meet UL Class 90 uplift requirements, and Class 1 fire requirements.
13. The General Contractor is responsible for obtaining and installing the building frame anchor bolts. The manufacturer shall provide design loads and/or the anchor bolt size required. The General Contractor shall verify the anchor bolt lengths do not extend beyond the concrete foundation dimensions. The General Contractor shall verify that all bids meet the above minimum design criteria, including the requirements for Collateral Load of 5 psf.

B. Certain characteristics as dimensioned, detailed and specified shall not vary, including:

1. Roof decking and insulation systems.
2. Wall enclosure systems, insulation, etc. Including locations and sizes of openings, etc.
3. Column locations except to reduce quantity of columns.
4. Primary frame locations and spacing.
5. Secondary frame spacing (purlins, girts, etc.), except to reduce dimensions.
6. Shape or gauge of exposed sheet metal gutters, fascia, flashing, etc.
7. Roof slope or direction of slope.
8. Bracing of interior drywall and masonry partitions to roof structure.
9. Provide straight columns to a height of 20'-0" A.F.F. before tapering.

C. Certain characteristics as dimensioned, detailed and specified shall be allowed to vary to accommodate alternate framing, including:

1. Member sizes, except where clearances with scheduled ceiling heights, ductwork and piping, etc., as designed, create conflicts.
2. Concealed portions of flashings, except as required to maintain watertightness and system integrity.
3. Bracing methods, except where architectural elements create conflicts. Minor adjustments may be made by the Architect to accommodate bracing requirements.

D. Installation of the pre-engineered building system shall be performed by one of the following:

1. Authorized builder or contractor of the manufacturer having a minimum of 5 years' experience in installations of this type.
2. Contractor authorized by the manufacturer as trained and qualified to erect the manufacturer's product and have a minimum of 5 years' experience in installations of this type.

E. Manufacturer's Qualifications:

1. Provide pre-engineered metal buildings as produced by a manufacturer with not less than 10 years successful experience in the fabrication of pre-engineered metal buildings of the type and quality required.
2. IAS accredited according to the International Accreditation Service's AC472, "Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems", as set forth in the International Building Code, Section 1704.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver preformed metal roofing panels and trim items to the project site with no dents, scratches, or abraded areas. Deliver in manufacturer's standard bundles, securely bound and store at the project site raised above slab or ground level on pallets.

1.5 WARRANTY

- A. Special Project Warranty: Submit two executed copies of standard 2-year "Roofing Guarantee" on form included at the end of this section, covering work of this section, including roofing panels, trim, sheet metal flashing, roof insulation and roofing accessories, signed by installer (roofer).
- B. Furnish to the Owner written 20-year warranties for the following:
1. 20-year material failure warranty covering the cost of material and labor to repair, repaint, or replace materials not to exceed \$.80/SF for the aggregate of all claims.

2. 20-year weathertightness warranty to repair or stop any leaks not to exceed \$.50/SF for the aggregate of all claims.
3. The warranty dollar limits noted in items 1. and 2. above, shall be additive so that the aggregate value of the dollar limit of all claims shall not exceed \$1.30/SF.
4. 20-year warranty that coating shall not blister, peel, crack, chip or experience material rust-through for 20 years. For a period of 20 years, chalking shall not exceed #8-ASTM and fading shall be 5 ΔE Color Difference Units or less.

PART 2 - PRODUCTS

2.1 ACCEPTABLE PRODUCTS/MANUFACTURERS

- A. Basis of Design shall be Butler Manufacturing Co. Provide pre-engineered building as manufactured by one of the following:
- Schulte Building Systems, Inc.
(phone: 281.304.6111 web site: sbslp.com)
 - Alliance Seam 24 -AS24 Panel/PBR Panel; Alliance Steel
(phone 800.624.1579 web site: www.allianceokc.com)
 - MR 24 Roof Panels/BR II Wall Panels; Butler Manufacturing Co.
(phone 816.968.3304 web site: www.buttermfg.com)
 - Starshield Standing Seam Roof Panels/Dura-Rib Wall Panels; Star Manufacturing Co.
(phone 800.879.7827 web site: www.starbldg.com)
 - SSR Roof Panels/VP Panel Rib Wall Panels; VP Buildings, Inc.
(phone 800.238.3246 web site: www.vp.com)

2.2 MATERIALS: STRUCTURAL FRAMING SYSTEM

- A. Structural Steel Design:
1. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings."
 2. Bolted Connections: Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts."
 3. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses
 4. The structural system will be designed in accordance with a specified building code. (Refer to Design Loads and Building Codes).
 5. Anchor bolts shall be designed using loads provided by manufacturer.
- B. Primary Framing:
1. Rigid Frames
 - a. Frames shall consist of welded-up plate section columns and roof beams complete with necessary splice plates for bolted field assembly.
 - 1) All base plates, cap plates, compression splice plates and stiffener plates shall be factory welded into place and have the connection holes shop fabricated.
 - 2) Columns and roof beams shall be fabricated complete with holes in webs and flanges for the attachment of secondary structural members and bracing except for field work as noted on manufacturer's erection drawings.
 - b. All bolts for field assembly of frame members shall be high strength bolts as indicated on erection drawings.
 2. Provide straight columns to a height of 20'-0" A.F.F. before tapering.
 3. Endwall Structurals:
 - a. The endwall structurals shall be cold-formed channel members designed in accordance with the 1986 AISI Specification or welded-up plate sections designed in accordance with the 1989 AISC Specification.
 - b. Endwall frames shall consist of endwall corner posts, endwall roof beams and endwall posts as required by design criteria.
 - 1) All splice plates and base clips shall be shop fabricated complete with bolt connection holes. All base plates, cap plates, compression splice plates and stiffener plates shall be factory welded into place and have the connection holes shop fabricated.
 - 2) Beams and posts shall be shop fabricated complete with holes for the attachment of secondary structural members except for field work as noted on manufacturer's erection drawings.
 - c. Intermediate frames shall be substituted for endwall roof beams when specified.
 - 1) Necessary endwall posts and holes for connection to the intermediate frame used in the endwall shall be shop fabricated.

- C. Secondary Structural Members:

1. Purlins and Girts
 - a. Purlins and girts shall be "Z" shaped, precision roll formed.
2. Eave Struts: "C" sections.
3. Bracing
 - a. Bracing shall be located as indicated on drawings.
 - b. Diagonal bracing shall be hot-rolled rod of size indicated on drawings, and attached to columns and roof beams as shown on the drawings.
 - c. Optional fixed base wind posts or pinned base portal frames may be substituted for wall rod bracing on buildings as required.
 - d. Flange braces, purlin braces, etc., when required, shall be cold-formed and installed as indicated on drawings. In finished spaces, no flange braces for columns or purlins may be located below ceiling height.

D. Finish: Factory Primed Structural Painting

1. General:
 - a. Apply specified primer immediately after cleaning and pretreating.
 - b. All structural steel shall be prime painted as temporary protection against ordinary atmospheric conditions. Subsequent finish, painting, if required, shall be performed in the field by others.
 - c. Prior to painting all steel shall be cleaned of loose rust, loose mill scale, dirt and other foreign material. Unless otherwise specified the fabricator shall not sand-blast, flame clean or pickle prior to painting.
 - d. Factory cover all steel with one coat of red oxide primer paint formulated to equal or exceed the performance requirements of Federal Specification TT-P-636D, TT-P-664C and SSPC Paint-25.
2. Primary Frames:
 - a. Clean all steel per SSPC-SP2.
 - b. Apply one coat of water reducible alkyd primer by spray or dip method to a minimum coating thickness of 1.0 mil.
3. Secondary Structural Members:
 - a. Clean all steel per SSPC-SP8.
 - b. Apply one coat of coil applied polyester primer to a minimum coating thickness of 0.5 mil. (purlins and girts).

2.3 MATERIALS - WALL PANELS

- A. Exterior walls shall be covered with precision roll-formed Butlerib® II panels as furnished by Butler Manufacturing Company or approved equal.
 1. Panels shall be 3' wide with four major corrugations, 1½" high 12" on center with two minor corrugations between each of the major corrugations the entire length of the panel.
 2. Panels shall be one piece from base to building eave.
 3. The upper end of panels shall be fabricated with a mitered cut to match corrugations of Butlerib® II roof panels and square cut for all other roof panels.
 4. The bottom end of the panels shall be straight cut.
 5. Wall panels shall be properly aligned with structurals.
 6. Panel Design: Panel design shall be in accordance with AISI "Specifications for the Design of Light-Gage, Cold Formed Steel Structural Members," and in accordance with sound engineering methods and practices.
 7. 26 gage galvanized, per ASTM Specification A 653, and painted with exterior colors of Butler-Cote® 500 FP finish system, a full strength, 70% Kynar® 500/Hylar 5000™ fluoropolymer coating. Manufacturer warrants that coating shall not blister, peel, crack, chip, or experience material rust-through for 20 years. For a period of 20 years chalking shall not exceed #8 - ASTM and fading shall be 5ΔE Color Difference Units or less.
 - a. Refer to "Material Finish Schedule" for color.
- B. Trim material should be as follows:
 1. Exterior trim shall be of the same color as the exterior color of the Butlerib® II wall panel except the following:
 - a. Eave trim, gable trim, door side flashings and header flashings to be galvanized prepainted steel with Butler-Cote® 500 FP finish system, a full strength, 70% Kynar® 500/Hylar 5000™ fluoropolymer coating.
 - b. Downspouts and gutters shall be 24 gauge preprimed galvanized steel ready for field painting.
 - c. Interior trim shall be painted.
 - d. Flashings, trims, closures and similar items shall be as detailed on drawings as supplied by the manufacturer of the panel.

- C. Fasteners:
1. Butlerib® II wall panel-to-structural connections shall be made with Torx® head Scrubolt™ fasteners, Torx® head self-drilling screws or Lock-Rivet™ fasteners. Panel-to-panel connections shall be made with Torx® head self-drilling screws, or Lock-Rivets.
 2. Lock-Rivets (optional) shall be set by a special Lock-Rivet tool.
 3. Fastener locations shall be as shown on erection drawings as furnished by Butler Manufacturing Company.
 4. All exposed fasteners shall be either pre-painted to match wall color or shall be covered with plastic color caps to match wall color.
- D. Thermal Insulation: Provide glass fiber blanket insulation, of not less than 0.5 lb. per cu. ft. density, 4" nominal thickness at wall panels, with UL flame spread classification of 25 or less, and 2" wide continuous vapor tight edge tabs. Insulation shall be faced with manufacturer's standard vinyl film vapor barrier.
1. Retainer Strips: Provide 26 gage formed galvanized steel retainer clips to hold insulation in place at roof panels.

2.4 MATERIALS - ROOF PANELS

- A. Roof panels shall be roll formed MR-24 panels as manufactured by Butler Manufacturing Co. or approved equal. Architect shall choose from the manufacturer's standard colors.
- B. Roof Panels: Provide drawing quality aluminum coated steel sheets complying with requirements of ASTM A 463; coated both sides with a layer of aluminum-zinc alloy (approximately 55% aluminum, 45% zinc) applied by the continuous hot-dip method. Metal thickness not less than 24 gage (0.0239").
1. Color: Painted with exterior colors of Butler-Cote® 500 FP finish system, a full strength, 70% Kynar® 500/Hylar 5000™ fluoropolymer coating. Manufacturer warrants that coating shall not blister, peel, crack, chip, or experience material rust-through for 20 years. For a period of 20 years chalking shall not exceed #8 - ASTM and fading shall be 5ΔE Color Difference Units or less.
 2. The panels shall be 2' wide with two major corrugations, with a minimum rib height of 2¾" including the seam, 24" on center. Minor corrugations (cross fluting) at 6" on center between and perpendicular to the major corrugations, will be required to stiffen panel and reduce wind noise. Panels of 9", 12", 15", 18" and 21", in lengths up to 25' shall be provided as required.
 3. Provision for a full ½" thermal movement of the roof panel shall be accomplished by the use of clips with self-centering movable tabs and shall be non-friction creating during thermal expansion cycles. The movable tab shall be made of high strength 304 stainless steel. The clip base shall be a minimum of 16 ga. galvanized steel. The clip system shall provide a self-centering mechanism to center the clip during erection. The force required to move the movable tab shall not exceed 8 lbs.
 4. The roof shall provide for thermal expansion/contraction without detrimental effect to the roof panel when there is a 100°F. temperature difference between the inside structural framework of the building and the temperature of the roof panels.
 5. Roofing assemblies shall be installed on a minimum ¼" in 12" downslope to drain, except at endwalls which may be warped to a lesser elevation when "flat roofed" appearance is desired. All gable end panels installed below ¼" to 12" shall have sufficient elevation to provide positive drainage.
 6. Panels of maximum possible lengths shall be used to minimize end laps. Panel end splices shall allow the roof panels to expand and contract with roof panel temperature changes, with a floating splice connection. Endlaps shall be staggered 5'-0" at alternating panels. Continuous in line splices will not be permitted. Panel end laps shall be not less than 6", sealed with sealants and fastened together by aluminum clamping plates, forming a free floating splice. Sealant at end laps shall contain PVC beads to prevent expulsion of the sealant during fastening process.
 7. Ridge assembly shall be designed to allow roof panels to move lengthwise with expansion/contraction as the roof panel temperature changes, and the ridge assembly itself shall be designed to accommodate expansion/contraction in its own length caused by thermal movement.
 8. All endwall trim and roof transition flashing shall allow the roof panel to move relative to the wall panels as the roof expands and contracts with temperature changes.
 9. All sidelap sealant shall be factory applied.
 10. Material used in flashing and transition parts shall match the roof panel materials, be compatible, and shall not cause a corrosive condition. Copper and lead materials shall not be used with zinc or aluminum coated panels.
- C. Thermal Insulation: Provide glass fiber blanket insulation, of not less than 0.5 lb. per cu. ft. density, 6" nominal thickness at roof panels, with UL flame spread classification of 25 or less, and 2" wide continuous vapor tight edge tabs. Insulation shall be faced with manufacturer's standard vinyl film vapor barrier.
1. Provide thermal spacers.
 2. Retainer Strips: Provide 26 gage formed galvanized steel retainer clips to hold insulation in place at roof panels.

3. Provide insulation Liner System with minimum R-25.
- D. Fasteners:
 1. All connections to roof panels shall be made with clips with movable tabs that are seamed into the standing seam sidelaps. Panel-to-panel connections shall be made with positive field formed double lock standing seam.
 2. Exposed fasteners are permitted at the eave and splice only.
 3. Exposed eave fasteners shall be aluminum-zinc coated or stainless steel.
 4. Splice fasteners shall be stainless steel.
- E. Metal Accessories: Provide miscellaneous items as required for installation of work; all trim and metal flashing associated with the preformed metal panels shall receive the same finish as panels.
 1. Pipe flashing units shall be constructed of E.P.D.M. (ethylene Propylene Diene Monomer) rubber as manufactured by DuPont (Nordel 1440 Hydrocarbon). Unit shall be black in color with a ductile aluminum (Alloy A1100-0) reinforcing ring bonded to a rubber flange on the base of the flashing unit.
- F. Sealant: Provide one-part elastomeric polyurethane, polysulfide or silicone rubber sealant as recommended by roofing panel manufacturer.
- G. Snow Guards: Clear polycarbonate stops designed for attachment to pan surface of metal roof panels using adhesive sealant. Provide Snow Brakes model RTCLSM clear polycarbonate snow guards as manufactured by Berger Bros Co. (phone 800.523.8852; website: www.snowbrakes.com). Provide SB-190 Surebond Everseal Adhesive Caulk for attachment to roof panels. Adhesive shall also be acceptable to metal roofing manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION AND ERECTION

- A. General: Install preformed metal roofing and wall panels and related items in accordance with roofing panel manufacturer's instructions.
- B. Framing: Erect structural framing true to line, level and plumb, rigid and secure. Level base plates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use a non-shrinking grout to obtain uniform bearing and to maintain a level base line elevation. Moist cure grout for not less than 7 days after placement.
- C. Purlins and Girts: Provide rake purlins with tight fitting closure channels. Secure purlins and girts to structural framing and hold rigidly to a straight line by sag rods.
- D. Bracing: Provide diagonal rod or angle bracing in both roof and sidewalls as indicated.
- E. Framed Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical or electrical work. Securely attach to building structural frame.
- F. Roof Panels:
 1. Position and align panel with the eave structural member and align the panel with the panel clip.
 2. All side laps shall be field sealed by a lock-seaming device. Side lap sealant shall be factory applied.
 3. Panel end laps shall be not less than 6", sealed with sealants and fastened together by clamping plates, forming a free floating splice.
 4. Panel clips shall be attached to the secondary structural members.
- G. All connections of roof panels to structural members shall be made with clips with movable tabs that are seamed into the double lock standing seam side lap. Panel clips shall be attached to the secondary structural members.
- H. Panel-to-panel connections shall be made with positive field formed Pittsburgh double lock standing seam.
- I. Standing seams shall be formed by an electrically powered mechanical lock seaming device. Hand seaming devices may be required in some areas.
- J. Anchor components parts of the preformed metal roofing securely in place, providing for necessary thermal and structural movement.

- K. Thermal Insulation: Install insulation concurrently with installation of roof and wall panels in accordance with manufacturer's published directions. Install blankets straight and true in one-piece lengths with both sets of tabs sealed to provide a complete vapor barrier. Locate insulation on the underside of roof sheets, extending across the top flange of purlin members and held in place by retainer strips at each longitudinal joint of insulation, installed straight and taut. Provide thermal spacer blocks in accordance with manufacturer's recommendation.
- L. Install and securely anchor metal flashing, trim, gutters and related items to provide a weatherproof enclosure, no fasteners shall be exposed on the exterior face of the work.
- M. Clean roof panels of oil and contaminants before attaching snow guards to metal roof panels with adhesive sealant. Apply as per manufacturer's written recommendations and instructions. Do not use fasteners that will penetrate metal roof panels.
- N. Upon completion of installation of gutters, test gutters for leaks. Block off downspouts and fill gutters with water. Inspect gutters for leaks, repair leaks and re-test sections of gutters until all sections are leak-proof.
- O. Upon completion and during all roofing operations roof panels, gutters and other system components shall be thoroughly cleaned of filings, tailings, spatters and excess materials.
- P. During all mechanical and painting operations, provide temporary protective coverings to prevent damage by overspray, solders or other contaminants.
- Q. Structural system shall be plumb before wall panels are attached.
- R. Panels shall be aligned and attached in accordance with erection drawings furnished by Butler Manufacturing Company.
- S. All sidelaps shall be at least one full corrugation.
- T. Panels shall be sealed at the base with metal closures.

END OF SECTION

ROOFING WARRANTY

WHEREAS _____

of (Address) _____

herein called the "Roofing Contractor", has performed roofing and associated work ("work") on following project:

Owner: _____

Address: _____

Name and Type of Building: _____

Address: _____

Area of Work: _____ Date of Acceptance: _____

Warranty Period: _____ Date of Expiration: _____

AND WHEREAS Roofing Contractor has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

NOW THEREFORE Roofing Contractor hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in watertight condition.

This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
 - a. lightning;
 - b. Peak gust wind speed exceeding 120 miles per hour;
 - c. fire;
 - d. failure of roofing system substrate including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. faulty construction of chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. vapor condensation on bottom of roofing; and
 - g. activity on roofing by others including construction contractors, maintenance personnel, other persons, and animals whether authorized or unauthorized by Owner.
2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Contractor, and until cost and expense thereof has been paid by Owner or by another responsible party so designated.
3. The Roofing Contractor is responsible for damage to work covered by this Warranty, but is not liable for consequential damages to building or building contents, resulting from leaks or faults or defects of work.

4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Contractor, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void upon date of said alterations, but only to extent said alterations affect work covered by this Warranty. If Owner engages Roofing Contractor to perform said alterations, Warranty shall not become null and void, unless Roofing Contractor, prior to proceeding with said work, shall have notified Owner in writing, showing reasonable cause for claim that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this warranty.
5. The Owner shall promptly notify Roofing Contractor of observed, known or suspected leaks, defect, or deterioration, and shall afford reasonable opportunity for Roofing Contractor to inspect work, and to examine evidence of such leaks, defects, or deterioration.
6. This Warranty is recognized to be the only warranty of Roofing Contractor on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to him in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Contractor of responsibility for performance of original work in accordance with requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

Installation Company

By

Title

Business Address

Telephone Number

FAX Number

ATTEST:

Secretary

IN WITNESS THEREOF, this instrument has been duly executed this

_____ day of _____, 20_____.

(INSERT APPROPRIATE EXECUTION FORM)

* * * * *

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