

PROJECT MANUAL

JULY 25, 2018

**NEW TOWN HALL
AND
POLICE HEADQUARTERS RENOVATIONS**

**NORTH SMITHFIELD
RHODE ISLAND**

**SACCOCCIO & ASSOCIATES
ARCHITECTS**



1085 PARK AVENUE
CRANSTON, RHODE ISLAND

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G1.0	SHEET LIST, SYMBOL & ABBREVIATION LEGENDS
G2.0	CODE SHEET
A0.1 sd	SITE
AE1.1	EXISTING BASEMENT PLANS
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END OF LIST OF DRAWINGS

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DOCUMENT 00 11 19

REQUEST FOR PROPOSAL

Project:

New North Smithfield Town Hall
and
North Smithfield Police Headquarters Renovations
North Smithfield, Rhode Island

Owner:

Town of North Smithfield
Town Hall
One Main Street, Slatersville, Rhode Island 02876

Issuing Office:

Town of North Smithfield
Finance Department
Town Hall
One Main Street, Slatersville, Rhode Island 02876

Bridging Document Architect:

Saccoccio & Associates, Inc.
1085 Park Avenue, Cranston, Rhode Island 02910-3144

Architects, General Contractors, or Joint Venture Architects/Builders are invited, as Design/Builders, to submit qualifications and construction cost proposals on the above referenced project to the Issuing Office at the above address, until 10:00 a.m. on Thursday, August 16, 2018.

Proposals will be opened privately and evaluated by the Owner.

A Design/Build organization must include an Architect, currently registered to practice Architecture in Rhode Island, with demonstrable design abilities, and documented experience designing projects similar to, or related to, the building types to be Contracted for.

Proposal Documents in digital format on a compact disc may be obtained, in person only, on and after July 25, 2018 from the Finance Department, North Smithfield Memorial Town Hall, One Main Street, Slatersville, RI 02876, Monday – Wednesday 8:00 am to 4:00 pm, Thursday 8:00 am to 7:00 pm and Friday 8 am to noon. No deposit is required.

Bid security in the amount of five percent (5%) of the bid must accompany each bid. Bid security shall be in the form of bid bond or a certified check payable to the Town of North Smithfield.

The Owner will hold a mandatory pre-proposal conference starting at the new Town Hall (Currently Kendall Dean School), 83 Greene Street, North Smithfield, RI at 9:00 a.m. on Wednesday, August 1, 2018. The proposer's representative must register at the conference. Those not attending the conference will not be allowed to submit a proposal.

Refer to Document 00 21 16 - Instructions to Design/Build Proposers, for additional Proposal requirements.

A Performance Bond of one hundred percent (100%) of the contract price and a Labor and Material Payment Bond of one hundred percent (100%) of the contract price with a satisfactory surety company will be required of the successful bidder.

Proposer's attention is referred to the State requirements pertaining to conditions of employment to be observed, including Workmen's Compensation, Equal Employment Opportunity, and Minority Business Enterprises. Attention is also called to the fact that not less than the minimum wage rates as hereinafter set forth shall be paid on this project, in accordance with those prevailing wages on file with the Rhode Island Department of Labor and Training, Prevailing Wage Unit. It is the Proposer's responsibility to use the current Prevailing Wage table that is in effect on the Bid issuance date for this project. These wage rates are applicable for the duration of the contract. The table may be obtained at the Rhode Island Department of Labor and Training web site www.dlt.state.ri.us.

The Owner reserves the right to waive irregularities and to reject any or all proposals, whole or in part, to waive any informalities or defects in any or all proposals and to make awards deemed to be in the best interest of the Owner.

Per order of

Town Administrator
Gary S. Ezovski

END OF DOCUMENT

DOCUMENT 00 21 16

INSTRUCTIONS TO DESIGN/BUILD PROPOSERS

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| 2. BIDDER'S REPRESENTATIONS | 7. PERFORMANCE BOND AND PAYMENT BOND |
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ARTICLE 1 - DEFINITIONS

- 1.1** Proposal Documents include the Proposal and Contract Requirements and the proposed Contract Documents. The Proposal and Contract Requirements consist of the Invitation to Propose, Instructions to Design/Build Proposers, the Proposal Form, and other sample proposal and contract forms. The proposed Contract Documents consist of the Form of Agreement between the Owner and the Design/Builder, Drawings, Specifications and all Addenda issued prior to execution of the Contract. All references to "Bidding Documents" throughout this Project Manual shall be construed as the "Proposal Documents".
- 1.2** Definitions set forth in the Terms and Conditions of the Form of Agreements Between Owner and Design/Builder, or in other Contract Documents are applicable to the Proposal Documents.
- 1.3** Addenda are written or graphic instruments issued by the Owner prior to the execution of the Contract which modify or interpret the Proposal Documents by additions, deletions, clarifications or corrections.
- 1.4** A Proposal is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Proposal Documents.
- 1.5** The Base Bid is the sum stated in the proposal as the Total Project Cost for which the Proposer offers to perform the Work described in the Proposal Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternates.
- 1.6** An Alternate is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Proposal Documents, is accepted.
- 1.7** A Unit Price is an amount stated in the Proposal as a price per unit of measurement for materials, equipment or services for a portion of the Work as described in the Proposal Documents.
- 1.8** A Proposer is a person or entity who submits a Proposal and who meets the requirements set forth in the Proposal Documents. All references to "Bidder" throughout this Project Manual shall be construed as the "Proposer".
- 1.9** A Sub-bidder is a person or entity who submits a bid to a Proposer for materials, equipment or labor for a portion of the Work.

ARTICLE 2 – PROPOSER'S REPRESENTATIONS

- 2.1** The Proposer by making a Proposal represents that:

- 2.1.1** The Proposer has read and understands the Proposal Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Proposal is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.
- 2.1.2** The Proposal is made in compliance with the Proposal Documents.
- 2.1.3** The Proposer has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Proposer's personal observations with the requirements of the proposed Contract Documents. Claims for additional costs will not be accepted due to the Proposer's lack of knowledge of verifiable existing conditions.
- 2.1.4** The Proposal is based upon the materials, equipment and systems required by the Proposal Documents without exception.

ARTICLE 3 - PROPOSAL DOCUMENTS

3.1 DOCUMENTS

- 3.1.1** A complete set of Proposal Documents in digital format on a compact disc may be obtained, in person only, from the Issuing Office No deposit is required.
- 3.1.2** Proposal Documents will not be issued directly to Sub-bidders unless specifically offered in the Invitation to Propose.
- 3.1.3** Proposers shall use complete sets of Proposal Documents in preparing Proposals; the Owner assumes no responsibility for errors or misinterpretations resulting from the use of incomplete sets of Proposal Documents.
- 3.1.4** The Owner may make copies of the Proposal Documents available on the above terms for the purpose of obtaining proposals on the Work. No license or grant of use is conferred by issuance of copies of the Proposal Documents.

3.2 INTERPRETATION OR CORRECTION OF PROPOSAL DOCUMENTS

- 3.2.1** The Proposer shall carefully study and compare the Proposal Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Proposal is submitted, shall examine the site and local conditions, and shall at once report to the Owner errors, inconsistencies or ambiguities discovered.
- 3.2.2** Proposers and Sub-bidders requiring clarification or interpretation of the Proposal Documents shall make a written request which shall reach the Owner at least seven (7) calendar days prior to the date for receipt of Proposals.
- 3.2.3** Interpretations, corrections and changes of the Proposal Documents will be made by Addendum. Interpretations, corrections and changes of the Proposal Documents made in any other manner will not be binding, and Proposers shall not rely upon them.

3.3 SUBSTITUTIONS

- 3.3.1** The materials, products and equipment described in the Proposal Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.
- 3.3.2** No substitution will be considered prior to receipt of Proposals unless written request for approval has been received by the Owner at least ten (10) calendar days prior to the date for receipt of Proposals. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Owner's decision of approval or disapproval of a proposed substitution shall be final.
- 3.3.3** If the Owner approves a proposed substitution prior to receipt of Proposals, such approval will be set forth in an Addendum. Proposers shall not rely upon approvals made in any other manner.
- 3.3.4** No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

3.4 ADDENDA

- 3.4.1** Addenda will be transmitted to all who are known by the Issuing Office to have received a complete set of Proposal Documents.
- 3.4.2** Copies of Addenda will be made available for inspection wherever Proposal Documents are on file for that purpose.
- 3.4.3** Addenda will be issued no later than five (5) calendar days prior to the date for receipt of Proposals except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Proposals.
- 3.4.4** Each Proposer shall ascertain prior to submitting a Proposal that the Proposer has received all Addenda issued, and the Proposer shall acknowledge their receipt in the Proposal.

ARTICLE 4 - PROPOSAL PROCEDURES

4.1 PREPARATION OF PROPOSALS

- 4.1.1** Proposals shall be submitted on the forms included with the Proposal Documents.
- 4.1.2** All blanks on the proposal form shall be legibly executed in a non-erasable medium.
- 4.1.3** Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.
- 4.1.4** Interlineations, alterations and erasures must be initialed by the signer of the Proposal.

- 4.1.5** All requested Alternates shall be included in the Proposal. If no change in the Base Bid is required, enter "No Change."
- 4.1.6** Each copy of the Proposal shall state the legal name of the Proposer and the nature of legal form of the Proposer. The Proposer shall provide evidence of legal authority to perform within the jurisdiction of the Work. Each copy shall be signed by the person or persons legally authorized to bind the Proposer to a contract. A Proposal by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Proposal submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Proposer.

4.2 BID SECURITY

- 4.2.1** Each Proposal shall be accompanied by a bid security in the form and amount required if so stipulated in Document 00 11 16 - Invitation to Propose. The Proposer pledges to enter into a Contract with the Owner on the terms stated in the Proposal and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Proposer refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Paragraph 6.2.
- 4.2.2** If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, unless otherwise provided in the Proposal Documents, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.
- 4.2.3** The Owner will have the right to retain the bid security of Proposers to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Proposals may be withdrawn or (c) all Proposals have been rejected.

4.3 SUBMISSION OF PROPOSALS

- 4.3.1** All copies of the Proposal, the bid security, if any, and any other documents required to be submitted with the Proposal shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Proposals and shall be identified with the Project name, the Proposer's name and address and, if applicable, the designated portion of the Work for which the Proposal is submitted. If the Proposal is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED PROPOSAL ENCLOSED" on the face thereof.
- 4.3.2** Proposals shall be deposited at the designated location prior to the time and date for receipt of Proposals. Proposals received after the time and date for receipt of Proposals will be returned unopened.
- 4.3.3** The Proposer shall assume full responsibility for timely delivery at the location designated for receipt of Proposals.
- 4.3.4** Oral, telephonic, telegraphic, facsimile, e-mailed or other electronically transmitted Proposals will not be considered.

4.4 MODIFICATION OR WITHDRAWAL OF PROPOSAL

- 4.4.1** A Proposal may not be modified, withdrawn or canceled by the Proposer during the stipulated time period following the time and date designated for the receipt of Proposals, and each Proposer so agrees in submitting a Proposal.
- 4.4.2** Prior to the time and date designated for receipt of Proposals, a Proposal submitted may be modified or withdrawn by notice to the party receiving Proposals at the place designated for receipt of Proposals. Such notice shall be in writing over the signature of the Proposer. Written confirmation over the signature of the Proposer shall be received, and date and time stamped by the receiving party on or before the date and time set for receipt of Proposals. A change shall be so worded as not to reveal the amount of the original Proposal.
- 4.4.3** Withdrawn Proposals may be resubmitted up to the date and time designated for the receipt of Proposals provided that they are then fully in conformance with these Instructions to Design/Build Proposers.
- 4.4.4** Bid security, if required, shall be in an amount sufficient for the Proposal as resubmitted.

4.5 PROPOSAL REQUIREMENTS

4.5.1 Proposal Content

- 4.5.1.1** Provide completed Proposal consisting of a Technical Proposal and a separate sealed Proposal Form with the Total Project Cost in a sealed envelope or box clearly marked with the title and time and date of the opening. An Original Proposal clearly marked as "Original" and two (2) copies are required. Provide Bid Surety and a transmittal letter with the Original Proposal.
- 4.5.1.1** Names of Design/Build participants, if other than a legally established Design/Build organization with previously completed construction projects.
- 4.5.1.2** If the Proposer is a Design/Builder formed, for the occasion of this project, under a joint-venture agreement, A Design/Builder-Contractor agreement, or a Design/Builder-Architect agreement, provide a written description, or a copy, of the terms of the agreement. Where appropriate, Proposer is encouraged to use AIA Agreement Document A142, or B143.
- 4.5.1.3** Written statement of Architect's qualifications and recent design accomplishments.
- 4.5.1.4** Written statement of Design/Builder's (Contractor's) qualifications and recent construction accomplishments.
- 4.5.1.5** Written statement of Design/Builder's approach: Choice of construction and material options; proposed architectural detail sketches of building elements.
- 4.5.1.6** Evidence of Design/Builder's insurability (including automobile and professional liability, and builder's risk) in accordance with the terms of the Agreement.
- 4.5.2 Evaluation Criteria.**
See Document 00 24 16.

ARTICLE 5 - CONSIDERATION OF PROPOSALS

5.1 OPENING OF PROPOSALS

Proposals will be opened privately by the owner.

5.2 REJECTION OF PROPOSALS

The Owner has the right to reject any or all Proposals. A Proposal not accompanied by a required bid security or by other data required by the Proposal Documents, or a Proposal which is in any way incomplete or irregular is subject to rejection.

Failure to fill-in the Proposal Form with a price or "No Change" for all Alternates is subject to rejection. Failure to fill-in the Proposal Form the receipt of all issued Addendums is subject to rejection.

5.3 ACCEPTANCE OF PROPOSAL (AWARD)

5.3.1 It is the intent of the Owner to award a Contract to the Proposer who best demonstrates its qualifications to meet the project requirements, provided the Proposal has been submitted in accordance with the requirements of the Proposal Documents and does not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Proposal received and to accept the Proposal which, in the Owner's judgment, is in the Owner's own best interests.

5.3.2 The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Proposal Documents, and to determine the low Proposer on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 - POST-PROPOSAL INFORMATION

6.1 SUBMITTALS

6.1.1 The Proposer shall, as soon as practicable or as stipulated in the Proposal Documents, after notification of selection for the award of a Contract, furnish to the Owner in writing:

- .1** a designation of the Work to be performed with the Proposer's own forces;
- .2** names of the manufacturers, products, and the suppliers of principal items or systems of materials and equipment proposed for the Work;
- .3** names of persons or entities (including Subcontractors and those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work; and
- .4** names of persons and dollar value of sub-contract Work to be performed by Minority Business Enterprises in accordance with the State's requirement that 10 percent of the dollar value of the Work performed against contracts for construction exceeding \$5,000.00 shall be performed by Minority Business Enterprises where it has been determined that sub-contract opportunities exist and where certified Minority Business Enterprises are available. A Proposer may count towards its MBE, DBE or WBE goals 60 percent of its expenditures for materials and supplies required under contract and obtained from MBE, DBE, or WBE regular manufacturers. Awards of this type shall be subject to approval by the Director of Administration of a Sub-Contracting Plan submitted by the Proposer receiving the Award.

- 6.1.2** The Proposer will be required to establish to the satisfaction of the Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Proposal Documents. The Proposer is to submit to the Owner a list of all Subcontractors and major vendors they intend to use of this project
- 6.1.3** Prior to the execution of the Contract, the Owner will notify the Proposer in writing if the Owner, after due investigation, has reasonable objection to a person or entity proposed by the Proposer. If the Owner has reasonable objection to a proposed person or entity, the Proposer may, at the Proposer's option, (1) withdraw the Proposal or (2) submit an acceptable substitute person or entity with an adjustment in the Total Project Cost to cover the difference in cost occasioned by such substitution. The Owner may accept the adjusted price or disqualify the Proposer. In the event of either withdrawal or disqualification, bid security will not be forfeited.
- 6.1.4** Persons and entities proposed by the Proposer and to whom the Owner has made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner.

ARTICLE 7 - PERFORMANCE BOND AND PAYMENT BOND

- 7.1.1** The Proposer shall furnish bonds covering the faithful performance of the Contract and Payment of all obligations arising thereunder. Bonds may be secured through a surety company licensed to do business in the State of Rhode Island. Their costs shall be included in the Proposal.
- 7.1.2** If the furnishing of such bonds is stipulated in the Proposal Documents, the cost shall be included in the Proposal. If the furnishing of such bonds is required after receipt of Proposals and before execution of the Contract, the cost of such bonds shall be added to the Proposal in determining the Contract Sum.
- 7.1.3** If the Owner requires that bonds be secured from other than the Proposer's usual sources, changes in cost will be adjusted as provided in the Contract Documents.
- 7.2 TIME OF DELIVERY AND FORM OF BONDS**
- 7.2.1** The Proposer shall deliver the required bonds to the Owner prior to the date of execution of the contract.
- 7.2.2** Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond. Both bonds shall be written in the amount of the Contract Sum.
- 7.2.3** The bonds shall be dated before the date of the Contract.
- 7.2.3** The Proposer shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

ARTICLE 8 - FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

- 8.1** The Agreement for the Work between the Owner and Design/Builder will be Document 00 52 13.

END OF DOCUMENT

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DOCUMENT 00 24 16

EVALUATION CRITERIA

ARTICLE 1 - PROJECT OBJECTIVES

- 1.1** The Owner will examine the Proposals and recommend the award of the Design/Build project. The Proposal Documents listed in DOCUMENT 00 00 10 - TABLE OF CONTENTS and DOCUMENT 00 00 15 - LIST OF DRAWINGS describe the size, arrangement, character, materials and systems that the Owner would like to see incorporated into the final project. Proposers should strive to provide a final project which complies completely with the criteria of the Proposal Documents insofar as is possible.
- 1.2** Proposers are requested to provide with their Proposal specific modifications to the Proposal Documents they require in order to provide a proposal that does not exceed the Construction Cost Limit, if this is necessary. Such modifications must be in conformance with code requirements, meet the program requirements illustrated by the Proposal Documents and provide the full functionality typical of facilities of this type. The Proposal should include a statement, not exceeding ten (10) pages, detailing the specific modifications proposed, the rationale for proposing them and how they will ensure compliance with the criteria of this paragraph.
- 1.3** The Design/Builder is responsible for modifying the Proposal Documents as is necessary to comply with all codes, regulations and requirements of authorities having jurisdiction. This work will be completed within the Contract price.
- 1.4** The Owner seeks to construct a facility that conforms as closely as possible to the design represented in the Proposal Documents.

ARTICLE 2 - PROPOSAL EVALUATION

- 2.1** Qualified proposals will be ranked by the Technical Committee per the following schedule. Cost proposals, submitted in a separate, sealed envelope will not be opened and scored until the technical points have been scored. The cost proposal with the lowest total project cost automatically receives the full 30 points under "Total Project Cost." Proposals must score at least 45 of a possible 70 technical points in order to have their cost proposals opened and scored. Proposals that fail to be awarded 45 technical points by the Technical Committee will be eliminated from further consideration.
- 2.2** Qualified Proposals submitted will be ranked per the following point allocation criteria.
 - 1. (30 points)** Design/Builder's understanding and sensitivity to the Project Program and Design Parameters.

Demonstrate: By submission of photographs or renderings of recent past examples of architectural design; by submission of hypothetical detail sketches illustrating ability and an affinity for producing a design compatible with the Owner's requirements.

2. (30 points) Design/Builder's proficiency with programmed Design elements and building materials.

Demonstrate: By submission of photographs or renderings of recent past examples of completed projects that indicate experience with types of construction generally compatible with the Owner's requirements.

3. (10 points) Design/Builder's (Contractor's) ability to fast track.

Demonstrate: By submitting written, verifiable, evidence of qualifications and recent past performance.

4. (30 points) Total Project Cost.

Provide a multi-division cost breakdown, including "General Conditions" that equals the total project cost.

(Submit Document 00 42 13 – Proposal Form, which includes the Total Project Cost information, in a separate sealed envelope.)

- 2.3 The Owner reserves the right to reject any or all proposals as it may determine, in its sole judgment, to be in their best interest.

END OF DOCUMENT

DOCUMENT 00 42 13

PROPOSAL FORM

Submit this form in a separate sealed envelope in accordance with Document 00 21 16 - Instructions to Design/Build Proposers.

Date: _____

Bid to: Town of North Smithfield
Finance Department
Town Hall
One Main Street
Slatersville, Rhode Island 02876

Project: New North Smithfield Town Hall &
North Smithfield Police Headquarters Renovations
North Smithfield, Rhode Island

Submitted by:

Company Name: _____

Address: _____

Telephone: _____

Fax: _____

Contact: _____

License Number: _____
(If Applicable)

1. PROPOSAL COST

Having examined the Place of The Work and all matters referred to in the Instructions to Design/Build Proposers, and in the Proposal Documents prepared by Saccoccio & Associates, Architects for the aforementioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum noted below:

- New North Smithfield Town Hall
Base Bid Amount "A"

_____ (\$ _____.)
(written, and numerically)

- North Smithfield Police Headquarters Renovations
Base Bid Amount "B"

_____ (\$ _____.)
(written, and numerically)

- GRAND TOTAL BASE BID

Grand total base bid is the sum of both "A" & "B" Base Bid amounts if projects are conducted simultaneously including any applicable discounts.

_____ (\$ _____.)
(written, and numerically)

We have included the Bid security as required by the Request for Proposal.

2. COST BREAKOUTS

The Proposer is to breakout the asbestos abatement costs that are included in the Base Bid amounts stipulated above. Include the asbestos abatement line item cost breakdown attached to this Proposal Form with the Bid.

A. Asbestos abatement for Base Bid "A"

_____ (\$ _____.)
(written, and numerically)

B. Asbestos abatement for Base Bid "B"

_____ (\$ _____.)
(written, and numerically)

NOTE: The low proposer may be asked to submit a multi-division line item cost breakdown of their proposal cost for the entire project prior to award.

3. ALLOWANCES

We have included the specified Allowances, from Section 01 21 00 in Division 1 of the Specifications, in the above Bid Sums as follows:

- Interior & Exterior Signage – Base Bid "A" \$ 5,000.00
 - Interior & Exterior Signage – Base Bid "B" \$ 5,000.00
 - Roof Repair Allowance – Base Bid "B" \$ 75,000.00
 - Testing & Inspection Allowance \$ 30,000.00
- Total Allowances \$ 115,000.00

4. ALTERNATES

We propose to modify the above Grand Total Bid Sum by the following amounts as identified by numbered Alternates specified in Division 1 of the Specifications, and as may be selected by the Owner:

Alternate No. 1 – Alternate Start Date for Base Bid “B” (180 calendar days)

Add - Deduct: _____ (\$ _____)
(circle one) (written, and numerically)

Alternate No. 2 – New Asphalt Paving & Striping at New Town Hall

add: _____ (\$ _____)
(written, and numerically)

Alternate No. 3 – New Finishes in the Police Workout Area

add: _____ (\$ _____)
(written, and numerically)

Alternate No. 4 – New Finishes and Partition on the First Floor at Police Headquarters

add: _____ (\$ _____)
(written, and numerically)

Alternate No. 5 – Repair of Existing Plaster Ceilings at Police Headquarters

add: _____ (\$ _____)
(written, and numerically)

Alternate No. 6 – Replace Roof at New Town Hall

add: _____ (\$ _____)
(written, and numerically)

Alternate No.7 - Patch Plaster Ceilings at Police Headquarters

add: _____ (\$ _____)
(written, and numerically)

5. UNIT PRICES

We propose the following Unit Prices for specific portions of the Work as listed. These Unit Prices shall be for additions to or subtractions from the Base Bid work and shall be performed under the Contract during the entire life of the Contract.

<u>Item Description</u>	<u>Unit Quantity</u>	<u>Unit Value</u>
a. Contractor General Conditions.	Thirty one (31) calendar days.	\$_____
b. Patch and repair existing plaster ceiling.	10 square feet	\$_____

6. ACCEPTANCE

This offer shall be open to acceptance and is irrevocable for sixty (60) days from the proposal closing date. If the Owner accepts this proposal within the time stated above, we will:

- Execute the Agreement subject to compliance with the Request for Proposal.
- Furnish the required bonds in compliance with amended provisions of the Instructions to Design/Build Proposer.
- Commence work within seven (7) days after the signing of the Contract.

7. BID SECURITY DEPOSIT

If this proposal is accepted within the time stated, and we fail to commence the Work, or we fail to provide the required Bonds, the Bid Security Deposit shall be forfeited as damages to the Owner by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this proposal and the proposal upon which a Contract is signed.

In the event our proposal is not accepted within the time stated above, the required Bid Security Deposit shall be returned to the undersigned, in accordance with the provisions of the Instructions to Design/Build Proposer; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

8. CONTRACT TIME

- Expected award of Contract and delivery of a Notice to Proceed is to be September 2018.
- Ordering of products, coordination and preparatory work is to commence within seven days after the receipt of the Notice to Proceed.
- Asbestos abatement and demolition can start prior to completion and approval of construction documents.
- Construction at both buildings is to be simultaneous (unless Alternate No. 1 is accepted).
- Substantial completion date of both buildings is 365 calendar days after the receipt of the Notice to Proceed. (unless Alternate No. 1 is accepted whereby substantial completion of Base Bid "B" work is 545 calendar days after the receipt of the Notice to Proceed.

9. LIQUIDATED DAMAGES

In as much as time is of the essence, if we fail to achieve certification of Substantial Completion at the expiration of the agreed upon Contract Time, we acknowledge we will be assessed Liquidated Damages of five hundred dollars (\$ 500.00) for each calendar day the project continues to be in default past the Substantial Completion date.

10. ADDENDA

The following Addenda (if any) have been received. The modifications to the Proposal Documents noted in the Addenda have been considered and all costs are included in the Bid Sums.

Addendum No. 1, dated _____

Addendum No. 2, dated _____

Addendum No. 3, dated _____

11. PROPOSAL FORM SIGNATURE(S)

(Bidder's name)

Title: _____

Corporate Seal:

END OF DOCUMENT

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ASBESTOS ABATEMENT	
Proposal Line Item Cost Breakdown	Cost
NEW TOWN HALL (Base Bid "A")	
Various Areas - Wall surface areas	
Basement - Floor covering materials	
Basement - Thermal pipe insulation	
Various Areas - Thermal pipe insulation repair	
Basement/Crawlspace - Thermal pipe insulation (already containerized)	
Various Rooms - Chalkboards and associated glues	
Various Locations - Intact removal & disposal of entire wood windows	
Exterior - Caulk at exterior of window and door frames	
Exterior - Removal of all caulk and window sash glazing debris	
Exterior - Removal of presumed contaminated soil	
General Requirements, O&P, Fees, Permits, Bond Premiums	
Total cost of Asbestos Abatement for Base Bid "A"	
POLICE HEADQUARTERS (Base Bid "B")	
Basement - Original plaster, gypsum wallboard, joint compound	
Basement - Repairs of original plaster, gypsum wallboard, joint compound scheduled to remain.	
Basement - Ceiling tile & ceiling tile glue	
First Floor - Original plaster, gypsum wallboard, joint compound	
First Floor - Repairs of original plaster, gypsum wallboard, joint compound scheduled to remain.	
First Floor - Ceiling tile & ceiling tile glue	
Exterior - Intact removal of metal windows	
Exterior - Caulk at exterior of window and door frames	
Exterior - Removal of all caulk and window sash glazing debris	
Exterior - Removal of presumed contaminated soil	
General Requirements, O&P, Fees, Permits, Bond Premiums	
Total cost of Asbestos Abatement for Base Bid "B"	

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DOCUMENT 00 43 13

BID BOND

AIA Document A310 - Bid Bond, 2010 Edition - Electronic Format, is included, following this page, as an integral part of the Proposal Documents, for use in fulfilling Bid Security requirements in lieu of submitting a certified check.

END OF DOCUMENT

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AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

Town of North Smithfield
Town Hall
One Main Street
Slatersville, Rhode Island 02876

BOND AMOUNT: \$**PROJECT:**

(Name, location or address, and Project number, if any)

New Town Hall
575 Smithfield Road, North Smithfield, RI 02896
and
Police Headquarters Renovations
83 Greene Street, North Smithfield, RI 02896

The Contractor and Surety are bound to the Owner in the amount set forth above, for the payment of which the Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, as provided herein. The conditions of this Bond are such that if the Owner accepts the bid of the Contractor within the time specified in the bid documents, or within such time period as may be agreed to by the Owner and Contractor, and the Contractor either (1) enters into a contract with the Owner in accordance with the terms of such bid, and gives such bond or bonds as may be specified in the bidding or Contract Documents, with a surety admitted in the jurisdiction of the Project and otherwise acceptable to the Owner, for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof; or (2) pays to the Owner the difference, not to exceed the amount of this Bond, between the amount specified in said bid and such larger amount for which the Owner may in good faith contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect. The Surety hereby waives any notice of an agreement between the Owner and Contractor to extend the time in which the Owner may accept the bid. Waiver of notice by the Surety shall not apply to any extension exceeding sixty (60) days in the aggregate beyond the time for acceptance of bids specified in the bid documents, and the Owner and Contractor shall obtain the Surety's consent for an extension beyond sixty (60) days.

If this Bond is issued in connection with a subcontractor's bid to a Contractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

Signed and sealed this day of

_____	_____
(Witness)	(Contractor as Principal) (Seal)
_____	_____
	(Title)
_____	_____
	(Surety) (Seal)
_____	_____
(Witness)	(Title)

DOCUMENT 00 52 13

AGREEMENT FORM

This **FIXED PRICE DESIGN AND CONSTRUCTION AGREEMENT BETWEEN OWNER AND DESIGN/BUILDER** (the "Agreement") is made and entered into by and between

The Town of North Smithfield
(the "Owner")

and _____
(the "Design/Builder").

This Agreement is executed under seal and shall be effective on the date executed by the last party to execute it.

This Agreement is for the design and construction of a project identified as:
New Town Hall and Police Headquarters Renovations for the Town of North Smithfield
(the "Project").

NOW, THEREFORE, in consideration of the mutual promises, covenants and agreements stated herein, and for other good and valuable consideration, the sufficiency of which is hereby acknowledged, Owner and Design/Builder agree as follows:

TABLE OF ARTICLES

1. THE CONTRACT & THE CONTRACT DOCUMENTS
 2. DESIGN/BUILDER'S REPRESENTATION
 3. REGULATORY GUIDELINES, REQUIREMENTS & STANDARDS
 4. PRELIMINARY CONSULTATION & PROJECT ANALYSIS
 5. PRELIMINARY DESIGN
 6. DETAILED DESIGN
 7. CONSTRUCTION SERVICES
 8. TIME FOR CONSTRUCTION: THE CONTRACT TIME
 9. ADDITIONAL DUTIES & RESPONSIBILITIES OF DESIGN/BUILDER
 10. CONTRACT PRICE
 11. PAYMENT OF THE CONTRACT PRICE
 12. SUBSTANTIAL & FINAL COMPLETION
 13. OWNER'S DUTIES, OBLIGATIONS & RESPONSIBILITIES
 14. PROJECT DOCUMENTATION
 15. PERSONNEL, SUBCONTRACTORS & SUPPLIERS
 16. CHANGES & EXTENSIONS OF TIME
 17. CLAIMS BY DESIGN/BUILDER
 18. UNCOVERING & CORRECTING WORK
 19. SUSPENSION & TERMINATION
 20. OWNERSHIP OF DOCUMENTS
 21. INDEMNITY
 22. INSURANCE
 23. SURETY BONDS
 24. MISCELLANEOUS PROVISIONS
- EXHIBIT A

ARTICLE 1 - THE CONTRACT AND THE CONTRACT DOCUMENTS

1.1 The Contract: The Contract between Design/Builder and Owner, of which this Agreement is a part, consists of the Contract Documents. The Contract shall be effective on the date this Agreement is effective.

1.2 The Contract Documents: The Contract Documents consist of this Agreement, the Design Scope Specification, Specification Sections listed in Document 00 00 10, Drawings listed in Document 00 00 15, all Design Documents hereafter prepared by Design/Builder and approved by the Owner in accordance with this Agreement, Change Orders and Field Orders issued hereafter, any other written amendments executed by the Owner and the Design/Builder, as well as the following (if any):

all of which are hereby incorporated herein by reference and made a part hereof.

1.3 Enumerated Documents Form Entire Contract: Documents not specifically enumerated in Paragraph 1.2 of this Agreement are not Contract Documents.

1.4 Complete Agreement: The Contract, together with Design/Builder's and Surety's performance and payment bonds for the Project, if any, constitute the entire and exclusive agreements between Owner and Design/Builder with reference to the Project. The Contract supersedes any and all prior documents, discussions, communications, representations, understandings, negotiations or agreements by and between the parties.

1.5 Contract Interpreted As A Whole: The Contract is intended to be an integral whole and shall be interpreted as internally consistent. Work required by any page, part, or portion of the Contract shall be required.

1.6 Provision Of All Things Required: Anything that may be required, implied or inferred by the Contract Documents which make up this Contract, or any one or more of them, shall be provided by Design/Builder for the Contract Price.

1.7 Privity Only With Design/Builder: Nothing contained in the Contract shall create, nor be interpreted to create, privity or any other relationship whatsoever between Owner and any person except Design/Builder.

1.8 Agreed Interpretation Of Contract Terms: When a word, term, or phrase is used in this Contract, it shall be interpreted or construed first, as defined herein; second, if not defined, according to its generally accepted meaning in the construction industry; and third, if there is no generally accepted meaning in the construction industry, according to its common and customary usage. Headings are used herein solely for convenience.

1.9 Term "Include" Intended To Be Encompassing: "Include", "includes", or "including", as used in the Contract, shall be deemed in all cases to be followed by the phrase, "without limitation".

1.10 Use Of Singular And Plural: Words or terms used as nouns in the Contract shall be inclusive of their singular and plural forms, unless the context of their usage clearly requires a contrary meaning.

1.11 Definition Of Material Breaches Not Exhaustive: The specification herein of any act, failure, refusal, omission, event, occurrence or condition as constituting a material breach of the Contract shall not imply that any other, non-specified act, failure, refusal, omission, event, occurrence or condition shall be deemed not to constitute a material breach of the Contract.

1.12 Order Of Precedence: In the event of any conflict, discrepancy, or inconsistency among any of the Contract Documents, which make up this Contract, the following shall control:

1.12.1 As between figures given on plans and scaled measurements, the figures shall govern;

1.12.2 As between large-scale plans and small scale plans, the large scale plans shall govern;

1.12.3 As between plans and specifications, the requirements of the specifications shall govern;

1.12.4 As between this document and the plans or specifications, this document shall govern.

ARTICLE 2 - DESIGN/BUILDER'S REPRESENTATIONS

2.1 Specific Representations: In order to induce Owner to execute this Agreement and recognizing that Owner is relying thereon, Design/Builder, by executing this Agreement, and without superseding, limiting, or restricting any other representation or warranty set forth elsewhere in this Agreement or the Contract, or implied by operation of law, makes the following express representations to Owner:

2.1.1 Design/Builder is professionally and fully qualified to act as the design professional and the general Design/Builder for the Project and is, and will remain, licensed to practice engineering and architecture and general contracting by all public entities having jurisdiction over Design/Builder or the Project;

2.1.2 Design/Builder will maintain all necessary licenses, permits or other authorizations necessary to act as Design/Builder for the Project until Design/Builder's duties hereunder have been fully satisfied;

2.1.3 Design/Builder has the expertise, experience, and knowledge as well as the necessary plant, personnel and financial capability to perform the Design Services and the Work in accordance with the terms of the Contract;

2.1.4 Prior to the execution of this Agreement, Design/Builder has visited and inspected the Project site and the local conditions under which the Project is to be designed, constructed and operated, and Design/Builder has performed such tests, if any, as are necessary to determine the conditions under which the Work will be performed, and Design/Builder accepts the conditions of the Work site and has taken those conditions into account in entering into the Contract;

2.1.5 Design/Builder assumes full responsibility to Owner for the improper acts and omissions of its Subcontractors or others employed or retained by Design/Builder in connection with the Project.

ARTICLE 3 - REGULATORY GUIDELINES, REQUIREMENTS AND STANDARDS

3.1 Generally: The Design/Builder shall perform all Design Services described in, contemplated by, inferable from, or necessary or desirable to achieve the objectives stated in the Design Scope Specification and the Contract, including all Design Services necessary for the Project to be properly constructed by the Design/Builder and used, operated and maintained by the Owner in accordance with all applicable guidelines, requirements and standards. "Design Services" means any and all architectural, engineering and design services required to be performed by the Design/Builder pursuant to the Contract and all labor, materials, supervision, equipment, computers, documents, and all other things necessary for the performance of such services. "Design Scope Specification" means the documents prepared by the Owner which specify the general scope of the Design Services to be performed by the Design/Builder under the Contract. A copy of the Design Scope Specification is attached hereto as Exhibit "A" and is incorporated herein by reference. The Design Services shall be performed within the time provided by the Design Schedule for the performance of Design/Builder's Design Services as provided in Paragraph 3.8 of this Agreement.

3.2 Owner's Review of Design Services: Subject to Paragraph 13.7 of this Agreement, the Design/Builder shall submit all documents produced as part of the Design Services to the Owner's Representative for review and approval in accordance with the terms of the Contract. However, any such review or approval by the Owner or the Owner's Representative shall not relieve the Design/Builder of or otherwise diminish its obligations under the Contract. The Owner may direct the Design/Builder to make changes to any such documents in order to conform such documents to the Owner's objectives. Any such changes by the Design/Builder ordered by the Owner shall not relieve the Design/Builder of its obligations hereunder unless, and only to the extent that, the Design/Builder notifies the Owner in writing within seven (7) days of receipt of the Owner's directive to make such changes of any adverse impact on schedules, budgets, operational costs, operational performance, satisfaction of regulatory requirements, or other adverse impact that may result from such changes. Failure of the Design/Builder to submit its notice within said seven-(7) day period shall constitute a waiver by the Design/Builder of any claim for an adjustment to the Contract Price, the Design Schedule, or the Contract Time.

3.3 Preparation of Site Information: The Design/Builder shall prepare, as necessary, surveys and topographic information including aerial photographs needed to establish line and grade of sewers, location of property lines and easements. Sewer easements, both construction and permanent, shall be referenced to property lines by field surveys, and plans shall include the location of any improvement as it relates to property lines.

3.4 Retention of Geotechnical Consultants: In preparing the Design Documents, the Design/Builder shall retain an experienced, qualified geotechnical consultant to evaluate all geotechnical considerations relating to the design and construction of the Project. The Design/Builder shall be responsible for designing the Project in accordance with the analyses and recommendations of its geotechnical consultant.

3.5 Quality of Design Services: The Design/Builder shall be responsible for the professional quality, completeness, accuracy, and coordination of Design Documents. The Design/Builder shall provide Design Services that will result in an operationally cost-efficient and economical facility that meets all environmental and regulatory requirements as of the date hereof, and uses the most appropriate available technology. The Design/Builder shall provide for all testing and inspections required by sound professional architectural and engineering practices and by governmental authorities having jurisdiction over the Project.

3.6 Compliance With Laws And Regulatory Requirements: In providing Design Services, the Design/Builder shall comply with the lawful requirements of all federal, state, and local authorities having lawful jurisdiction over the Project. The Design/Builder shall design the Project to meet all applicable requirements of building control laws and regulations in relation to the design, construction, occupation, and operation of the

Project, including, without limitation, environmental standards, fire and safety regulations, and requirements and compliance with all other applicable standards and codes.

3.7 Duty to Correct Errors: The Design/Builder shall, without additional compensation, immediately correct any errors, omissions or deficiencies in its Design Services and Design Documents.

3.8 Schedule of Design Services: The Design/Builder shall submit for the Owner's approval the Design Schedule for the performance of the Design/Builder's Design Services which shall include allowance for reasonable time required for the Owner's review of submissions and for approvals of authorities having jurisdiction over the Project. The Design Schedule, when approved by the Owner, shall not, except for good cause, be exceeded by the Design/Builder. Should the Design/Builder at any time during the course of performing the Contract, have any reason to believe that it will be unable to meet any completion date in accordance with the Design Schedule, it shall immediately notify the Owner's Representative in writing. In such notice, the Design/Builder shall state the reason for the delay including the party responsible, if any, and the steps being taken to remedy or minimize the impact of the delay. Failure of the Design/Builder to submit such notice shall constitute a waiver by the Design/Builder of any claim for an adjustment to the Contract Price, the Design Schedule, or the Contract Time. All extensions of time shall be governed by Articles 16 and 17 of this Agreement. Subject to the provisions of Paragraph 13.7 of this Agreement, the Owner shall review and approve, where appropriate, the Design Schedule, or any portion thereof.

ARTICLE 4 - PRELIMINARY CONSULTATION AND PROJECT ANALYSIS

4.1 Determining The Project Objectives: Prior to the preparation of the Preliminary Design as required by Article 5 below, the Design/Builder shall first consult in detail with the Owner, and shall carefully analyze any information furnished by the Owner concerning requirements of the Project, including but not limited to, any design, construction, scheduling, budgetary or operational requirements, limitations, and objectives, as well as the Design Scope Specification.

4.2 Report On Project Requirements And Objectives: Based on its study and analysis, and no later than ten (10) days after the effective date of the Contract, the Design/Builder shall prepare and submit to the Owner a written report detailing the Design/Builder's understanding and analysis of the Project requirements and identifying any design, construction, scheduling, budgetary, operational, or other problems which may result from said requirements. The written report of Design/Builder shall also include proposed solutions, including design alternatives if appropriate, addressing each of the identified problems. The Design/Builder shall review such report with the Owner and shall implement such changes as the Owner may require as provided in Paragraph 3.2 of this Agreement.

ARTICLE 5 - PRELIMINARY DESIGN

5.1 Time For Preliminary Design: Not later than thirty (30) days after reviewing with Owner the written report required by Paragraph 4.2 above (if the foregoing blank not filled in, then within a reasonable time so as not to delay Substantial Completion), the Design/Builder shall prepare and submit to the Owner a Preliminary Design for the Project.

5.2 Contents of Preliminary Design: The Preliminary Design shall address all requirements of the Project and shall include, without limitation, the following:

5.2.1 Preliminary drawings which illustrate each of the basic components of the Project including the size, scale, location, dimensions, and character of each building structure;

5.2.2 Preliminary drawings which illustrate each exterior view of the Project;

- 5.2.3** Preliminary drawings which illustrate a floor plan for each room, office, and functional area of the Project and the dimensions thereof;
- 5.2.4** Preliminary drawings and specifications illustrating and describing the architectural, electrical, mechanical, structural, and manufacturing systems of the Project;
- 5.2.5** A written description of the materials and equipment to be incorporated into the Project and the location of same;
- 5.2.6** Any other documents or things required to illustrate, describe or depict the Preliminary Design and the conformity of same with the requirements of the Design Scope Specification and the Contract.
- 5.3 To Be Reviewed With the Owner:** The Design/Builder shall review with the Owner the Preliminary Design and shall incorporate any changes ordered by the Owner with respect to said Preliminary Design or with respect to the requirements of the Project.
- 5.4 Authorization to Proceed with Detailed Design:** After review of the Preliminary Design and incorporation of any changes ordered by the Owner, the Owner shall authorize the Design/Builder in writing to commence preparing the Detailed Design, or such part thereof as directed by the Owner.

ARTICLE 6 - DETAILED DESIGN

- 6.1 Time For Preparation:** Not later than sixty (60) days after Owner has authorized Design/Builder to commence with the Detailed Design as provided in Paragraph 5.4 above (if the foregoing blank not filled in, then within a reasonable time so as not to delay Substantial Completion), the Design/Builder shall prepare and submit to the Owner the complete Detailed Design.
- 6.2 The Detailed Design:** The Detailed Design shall include all Design Documents which shall describe with specificity all elements, details, components, materials, and other information necessary for the complete construction of the Project and the rendering of the Project fully operational for its intended purposes, including satisfaction of all testing, permitting, qualifications, certifications, validations, and obtaining regulatory approvals by all applicable regulatory authorities required to render the Project and all its components operational and functionally and legally usable for their intended purpose. Subject to the provisions of Paragraph 13.7 of this Agreement, the Owner shall review and approve, where appropriate, the Design Documents, or any portion thereof.
- 6.3 Design Documents:** "Design Documents" means all the design documents provided by the Design/Builder and approved by the Owner pursuant to the Contract including, without limitation, those for use in constructing the Project, performing the Work, and the rendering of the Project fully operational, and shall include, without limitation, detailed plans, drawings, specifications, manuals, and related materials prepared by or on behalf of the Design/Builder.

ARTICLE 7 - CONSTRUCTION SERVICES

- 7.1 General Intent:** The Design/Builder shall perform all Work necessary to construct the Project in accordance with the Contract and to render the Project and all its components operational and functionally and legally usable for their intended purpose.

7.2 Work Defined: The term "Work" shall mean whatever is done by or required of the Design/Builder to perform and complete its duties relating to the construction of the Project under the Contract, including, without limitation, the following:

7.2.1 Construction of the whole and all parts of the Project in full and strict conformity with the Contract;

7.2.2 The provision and furnishing, and prompt payment therefor, of all labor, supervision, services, materials, supplies, equipment, fixtures, appliances, facilities, tools, transportation, storage, power, fuel, heat, light, cooling, other utilities and things required for the construction of the Project;

7.2.3 The procurement and furnishing of all necessary building permits and other permits required for the construction of the Project;

7.2.4 The creation and submission to the Owner of detailed as-built drawings depicting all as-built construction;

7.2.5 The furnishing of any required surety bonds and insurance as required by the Contract;

7.2.6 The furnishing of all equipment and product warranties, manuals, test results and user guides required by the Contract or otherwise reasonably available to the Design/Builder;

7.2.7 The furnishing of all other services and things required or reasonably inferable from the Contract Documents, including the provisions of Article 9 below.

ARTICLE 8 - TIME FOR CONSTRUCTION: THE CONTRACT TIME

8.1 Notice of Commencement: After the Owner has approved the Design Documents for the Detailed Design, the Owner shall issue a notice to commence the Work directing the Design/Builder to proceed with the Work on the date indicated in the notice (the "Commencement Date"). The notice to commence Work shall be issued at least ten (10) days prior to the Commencement Date.

8.2 Time for Completion: The Design/Builder shall commence the Work on the Commencement Date, and the Work shall be carried out regularly and without interruption. The Design/Builder shall substantially complete the Work not later than three hundred sixty five (365) calendar days after receipt of the Notice to Proceed, signing of the Contract or such other date as may by Change Order be designated (the "Scheduled Completion Date"). The number of calendar days between the effective date of the Contract and the Scheduled Completion Date is the "Contract Time". The Design/Builder shall achieve Final Completion of the Work no later than thirty (30) calendar days after achieving Substantial Completion. The contract amount is to include winter conditions if necessary to complete the project within the stated time.

8.3 Liquidated Damages For Delay In Substantial Completion: The Design/Builder shall pay the Owner the sum of **Five Hundred Dollars (\$5,00.00)** per day for each and every calendar day of unexcused delay in achieving Substantial Completion beyond the Scheduled Completion Date. Any sums due and payable hereunder by the Design/Builder shall be payable, not as a penalty, but as liquidated damages representing an estimate of delay damages likely to be sustained by the Owner, estimated at the time of executing this Agreement. Such liquidated damages shall apply regardless of whether the Design/Builder has been terminated by the Owner prior to Substantial Completion so long as the Design/Builder's actions or inactions contributed to the delay. Such liquidated damages shall be in addition to and not in preclusion of the recovery of actual damages resulting from other defects in the Design/Builder's performance hereunder for matters other than delays in Substantial Completion. When the Owner reasonably believes that Substantial Completion will be unexcusably delayed, the Owner shall be entitled, but not required, to withhold from any amounts otherwise due

to the Design/Builder an amount then believed by Owner to be adequate to recover liquidated damages applicable to such delays. If and when the Design/Builder overcomes the delay in achieving Substantial Completion, or any part thereof, for which the Owner has withheld payment, the Owner shall promptly release to the Design/Builder those funds withheld, but no longer applicable as liquidated damages.

8.4 Time Is Of The Essence: All limitations of time set forth herein are material and time is of the essence of the Contract.

ARTICLE 9 - ADDITIONAL DUTIES AND RESPONSIBILITIES OF DESIGN/BUILDER

9.1 Design/Builder To Perform All Work Required By The Contract: The intent of the Contract is to require complete, correct and timely execution of the design and the Work. Any and all Work that may be required, reasonably implied or reasonably inferred by the Contract, or any part of it, as necessary to produce the intended result shall be provided by the Design/Builder in accordance with Article 10 of this Agreement and without increase to the Contract Price.

9.2 Strict Compliance With The Contract Documents: All Work performed by the Design/Builder shall be in strict compliance with the Contract. "Substantial compliance" is not strict compliance. Any Work not in strict compliance with the Contract is defective.

9.3 Supervision Of The Work: The Work shall be strictly supervised and directed using the Design/Builder's best and highest skill and effort, the Design/Builder bearing full responsibility for any and all acts or omissions of those engaged in the Work on behalf of the Design/Builder.

9.4 Warranty Of Workmanship And Materials: The Design/Builder warrants and guarantees to the Owner that all labor furnished to progress the Work under the Contract will be competent to perform the tasks undertaken and is the best quality obtainable, that the product of such labor will yield only first-class results in strict compliance with the Contract, that materials and equipment furnished will be of high quality and new unless otherwise permitted by the Contract, and that the Work will be of high quality, free from faults and defects and in strict conformance with the Contract. Any and all Work not strictly conforming to these requirements shall be considered defective and shall constitute a breach of the Design/Builder's warranty.

9.5 Commencement Of Guarantee And Warranty Periods: Special or specific guarantees and warranties which are required by the Contract to run for a fixed period of time shall commence running on the date of Substantial Completion of all the Work.

9.6 Design/Builder's Schedule Of Construction: The Design/Builder, within fifteen (15) days after the Commencement Date, shall submit to the Owner, for its information, and comply with, the Design/Builder's Schedule of Construction for completing the Work by the Scheduled Completion Date. The Schedule of Construction shall reflect the performance of all Work on weekdays and non-holidays. The Schedule of Construction shall be a detailed critical path (CPM) schedule in a form acceptable to the Owner. The Schedule of Construction shall be revised at least monthly and shall be revised to reflect conditions encountered from time to time and shall be related to the entire Project. Each such revision shall be furnished to the Owner. Strict compliance with the requirements of this Paragraph shall be a condition precedent for payment to the Design/Builder, and failure to strictly comply with said requirements shall constitute a material breach of the Contract.

9.7 Record Copy Of Contract Documents: The Design/Builder shall continuously maintain at the site, for the benefit of the Owner, an updated copy of the Contract, including one record copy of the Contract Documents marked to record on a current basis changes, selections and modifications made during construction. Additionally, the Design/Builder shall maintain at the site, for the benefit of the Owner, a copy of all Shop

Drawings, Product Data, Samples, and other Submittals. Upon Final Completion of the Work, or upon the Owner's request, all of the documents described in this Paragraph shall be finally updated and delivered to the Owner and shall become the property of the Owner.

9.8 Review And Approval Of Submittals: The Design/Builder shall review, study, and approve, or take other necessary action upon all Shop Drawings, Product Data, Samples, and other Submittals to ensure that the Project will be constructed in a timely fashion in strict compliance with the Contract.

9.9 Owner's Option To Review Submittals: The Owner shall, in its discretion, have the right to review and approve Submittals, and if the Owner so elects, the Design/Builder shall not perform any portion of the Work as to which the Owner has required submittal and review until such Submittal has been approved by the Owner's Representative. Approval by the Owner, however, shall not be evidence that Work installed pursuant thereto conforms with the requirements of the Contract nor shall such approvals relieve the Design/Builder of any of its responsibilities or warranties under the Contract. If the Owner elects to review Submittals, the Design/Builder shall maintain a Submittal log which shall include, at a minimum, the date of each Submittal, the date of any resubmittal, the date of any approval or rejection, and the reason for any approval or rejection. The Design/Builder shall have the duty to carefully review, inspect and examine any and all Submittals before submission of same to the Owner. Shop Drawings and other Submittals from the Design/Builder do not constitute a part of the Contract.

9.10 Procurement And Review Of Warranties: The Design/Builder shall procure from all Subcontractors and Suppliers and shall transmit to the Owner, all warranties required by the Contract. The Design/Builder shall review all such warranties and shall certify to the Owner that the warranties are in strict compliance with the requirements of the Contract.

9.11 Procurement Of Operations And Maintenance Documentation: The Design/Builder shall prepare or procure and shall transmit to the Owner all documentation required by the Contract regarding the operation and recommended maintenance programs relating to the various elements of the Work.

9.12 As-Built Drawings: The Design/Builder shall prepare and provide to the Owner a complete set of all as-built drawings which shall be complete and, except as specifically noted, shall reflect performance of the Work in strict compliance with the requirements of the Contract.

9.13 Compliance With Labor Laws: The Design/Builder shall assume all labor responsibility for all personnel assigned to or contracted for the performance of the Work and agrees to strictly comply with all its obligations as employer with respect to said personnel under all applicable labor laws.

9.14 Testing, Inspections, And Approvals: The Design/Builder shall be responsible for procuring all tests and inspections required by sound professional practices and by governmental authorities having jurisdiction over the Project, and the costs for such testing and inspections are to be deducted from the Testing and Inspections Allowance. The Design/Builder shall submit certified results of such tests to the Owner. If the laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any Work to be specifically inspected, tested, or approved, the Design/Builder shall assume full responsibility therefor, pay all costs in connection therewith and furnish to the Owner the required certificates of inspection, testing or approval.

9.15 Owner's Regulations And Applicable Laws: The Design/Builder shall, during the course of the Work, comply with any regulations or guidelines prescribed by the Owner. The Design/Builder warrants that it will comply with all public laws, ordinances, rules and regulations applicable to the services to be performed under the Contract, including without limitation, those relating to the terms and conditions of the employment of any person by Design/Builder in connection with the Work to be performed under the Contract.

9.16 Compliance With Construction Regulations: Design/Builder shall perform the Work in accordance with all construction codes, laws, ordinances or regulations applicable to the design and execution of the Work. Any fine or penalty which may be imposed as consequence of any violation of this provision shall be paid by the Design/Builder, and the Design/Builder shall indemnify and hold the Owner harmless from all loss, damages, and expense, including attorney's fees, resulting from any such violation or alleged violation.

9.17 Permits, Licenses And Notices: All construction and building permits, licenses and authorizations necessary for the construction of the Project shall be secured and paid for by the Design/Builder. The Design/Builder shall notify the Owner's Representative when it has received said permits, licenses and authorizations and upon receipt shall supply the Owner with copies of same. The originals of said permits, licenses and authorizations shall be delivered to Owner upon completion of the Work, and receipt of such documents by the Owner shall be a condition precedent to final payment. The Design/Builder shall also give and maintain any and all notices required by applicable laws pertaining to the construction of the Work.

9.18 Conditions To Site Access: While on the Owner's property, all the Design/Builder's employees and Subcontractors shall confine themselves to areas designated by the Owner's Representative and will be subject to the Owner's badge and pass requirements, if any, in effect at the site of the Work.

9.19 Site Safety And Security: The Design/Builder shall take all reasonable steps and legally required measures at the site to comply with applicable safety regulations and standards and to adequately protect the Work, stored materials, and temporary structures located on the premises, and to prevent unauthorized persons from entering upon the site. The Design/Builder shall at all times safeguard the Owner's property and employees from injury or loss in connection with the performance of the Contract. The Design/Builder shall at all times safeguard and protect its own partially or completely finished Work and that of the adjacent property and all adjacent work from damage. The Design/Builder shall protect the Owner's equipment, apparatus, machinery, and other property and all adjacent work with boarding and other safeguards so as to keep the premises free from dampness, dirt, dust, or other damage and shall remove all such temporary protection upon completion of the Work.

9.20 Repair Of Collateral Damages: Unless otherwise instructed by the Owner, the Design/Builder shall repair and return to original condition all buildings, streets, curbs, sidewalks, utilities or other facilities affected by the Design/Builder's performance of the Work, all without additional cost to the Owner.

9.21 Cleaning The Site: The Design/Builder shall keep the site reasonably clean during performance of the Work. Upon Final Completion of the Work, the Design/Builder shall thoroughly clean the site and the Project and remove all waste, debris, trash and excess materials or equipment, together with the Design/Builder's property therefrom.

9.22 Owner's Access To Work: At all times relevant to the Contract, the Design/Builder shall provide access to the Work to the Owner and its designees without formality or other procedure.

9.23 Decisions Regarding Aesthetic Effect: The Owner's decisions in matters relating to aesthetic effect shall be final if consistent with the intent of the Contract.

9.24 Design/Builder To Remain An Independent Design/Builder: In the performance of the Contract, the Design/Builder's status as an independent Design/Builder shall not be modified or diminished by reason of any instructions issued by the Owner or the Owner's Representative to the Design/Builder or any of the Design/Builder's employees, Subcontractors, or representatives.

ARTICLE 10 - CONTRACT PRICE

10.1 Contract Price: The Owner shall pay, and the Design/Builder shall accept, as full and complete payment for the Design Services, the performance of all the Work required by the Contract, and the performance of all requirements of this Agreement, the fixed price of:

_____ Dollars (\$_____).

The price set forth in the preceding sentence is referred to herein as the "Contract Price". The Contract Price shall not be modified unless all conditions precedent to a change in the Contract Price have been satisfied, including the execution of a Change Order in accordance with the requirements of this Agreement.

ARTICLE 11 - PAYMENT OF THE CONTRACT PRICE

11.1 Payment Procedure: The Owner shall pay the Contract Price to the Design/Builder in accordance with the procedures set forth in this Article 11.

11.2 Allocation Of Contract Price: The Contract Price shall be allocated between the Design Services and the Work as follows: _____ percent (____%) of the Contract Price shall be allocated to the Design Services, and _____ percent (____%) of the Contract Price shall be allocated to the Work.

11.3 Payment For Design Services: The amount of the Contract Price allocated to the Design Services shall be paid based upon the Design/Builder's achievement of each of the design milestones described in Exhibit "A". Upon achievement of each of the design milestones described in Exhibit "A", the Design/Builder shall submit a Pay Request with appropriate backup documentation. In its Pay Request for Design Services, the Design/Builder may request payment for ninety per cent (90%) of the value allocated for such Design Services as provided in this Article 11. The Owner shall pay such invoice as provided in this Article 11.

11.4 Payment For Construction Services - Schedule Of Values: Within ten (10) calendar days after the commencement of construction, the Design/Builder shall prepare and present to the Owner a Schedule of Values allocating among the different elements of the Work that portion of the Contract Price assigned to the Work. The Design/Builder's Schedule of Values shall be prepared in such form, with such detail, and supported by such data as the Owner may, at its option, require. The Design/Builder shall not front-end load its Schedule of Values, shall not imbalance its Schedule of Values nor assign a value to any element which exceeds its true value. The allocated value of each item in the Schedule of Values shall only include its total cost and proportionate share of any general overhead and profit. Any violation by Design/Builder of the requirements of this Paragraph shall constitute a material breach of the Contract. The Schedule of Values shall be used only as a basis for the Design/Builder's pay requests and shall only be so used after it has been acknowledged in writing by Owner.

11.5 Time For Construction Pay Requests: On or before the fifteenth day of each month after commencement of the Work, but no more frequently than monthly, the Design/Builder shall submit a pay request for the Work performed through the fifteenth day of the month.

11.6 Progress Payments For Construction Services: Based upon the Design/Builder's pay requests submitted to the Owner, the Owner shall make progress payments to the Design/Builder on account of the Contract Price less such amounts, if any, owing by the Design/Builder to the Owner or which the Owner shall have the right to withhold as authorized by this Agreement.

11.7 Contents And Amounts Of Pay Requests: Construction pay requests shall be in such form and manner, and with such supporting data and content as the Owner may require. In its construction pay request, the Design/Builder may request payment for (1) ninety percent (90%) of the value allocated to that portion of the

Work properly performed through the applicable date in the pay request; plus (2) ninety percent (90%) of that portion of the Contract Price properly allocable to materials or equipment necessary for the Work and properly stored at the Project site (or elsewhere if approved in advance in writing by the Owner); less (3) the total amount of previous payments received from the Owner for the Work. Payment on account of stored materials or equipment shall be conditioned upon the Design/Builder's proof, satisfactory to the Owner, that the Owner has title to such materials or equipment and that they are fully insured against loss or damage and that all required insurance regarding such materials or equipment is in full force and effect.

11.8 Design/Builder's Representations Regarding Pay Requests: Each pay request shall be signed by the Design/Builder and shall constitute the Design/Builder's representation that the Design Services and the Work have progressed to the level for which payment is requested in accordance with the milestones or the Schedule of Values, that the Design Services and the Work have been properly installed or performed in strict accordance with this Agreement, and that the Design/Builder knows of no reason why payment should not be made as requested. The submission by the Design/Builder of a pay request constitutes an affirmative representation and warranty that all Work for which payments have been received from the Owner is free and clear of liens, claims, security interests or other encumbrances in favor of Design/Builder or any other person or entity whatsoever. In the event that Owner learns that any representations of the Design/Builder as set in this Paragraph are wholly or partially inaccurate, the Owner may withhold payment of sums then or in the future otherwise due to the Design/Builder until the inaccuracy, and the cause thereof, is corrected to the Owner's reasonable satisfaction.

11.9 Owner's Review Of Pay Requests: The Owner shall have the right to review all pay requests and the Design Services and the Work at the Project site or elsewhere to determine whether the quantity and quality of the Work and the Design Services is as represented in the pay request and as required by the Contract.

11.10 Conditions Precedent To Payment: In addition to all other conditions precedent contained herein, it shall be a condition precedent to payment of any pay request that the Design/Builder have submitted updated schedules for the performance of its Work and Design Services as required by this Agreement.

11.11 Amount Of Progress Payments: The Owner shall pay the amount of each pay request properly due under this Agreement less such amounts, if any, owing by the Design/Builder to the Owner or which the Owner shall have the right to withhold as authorized by this Agreement.

11.12 Time For Payment: Subject to the Owner's right of review and objection, the Owner shall make payment on account of the Contract Price within forty five (45) calendar days following the receipt of the Design/Builder's pay requests.

11.13 Title Passes Upon Payment: The Design/Builder warrants and represents that upon payment of any pay request submitted by the Design/Builder, title to all Work covered by the pay request shall immediately pass to the Owner.

11.14 Design/Builder's Use Of Progress Payments: Upon receipt of any payment the Owner, the Design/Builder shall promptly pay all Subcontractors, materialmen, laborers, and Suppliers such amounts as they are entitled for the Work covered by such payment.

11.15 Use Of Joint Checks: If the Owner becomes informed that the Design/Builder has not paid a Subcontractor, materialman, laborer, or Supplier as provided herein, the Owner shall have the right, but not the duty, to issue checks and payment then or thereafter otherwise due to the Design/Builder naming the Design/Builder and any such Subcontractor, materialman, laborer, or Supplier as joint payees. Such joint check procedure, if employed by the Owner, shall create no rights in favor of any person or entity beyond the right of the named payees to payment of the check and shall not be deemed to commit the Owner to repeat the procedure

in the future nor to create any contractual or other relationship of any kind between Owner and such person or entity.

11.16 Payment Not A Waiver Or Acceptance: No payment to the Design/Builder, nor any use or occupancy of the Project by the Owner, shall be interpreted or construed to constitute acceptance of any Work not in strict compliance with the Contract, and the Design/Builder expressly accepts the risk that defective Work may not be detected (1) during any inspection by the Owner, (2) prior to making of any payment to the Design/Builder, or (3) before the Owner's occupancy of the Project.

11.17 Withholding Of Payment: The Owner shall have the right to refuse to make payment and, if necessary, may demand the return of a portion or all of the amount previously paid to the Design/Builder in an amount then believed by the Owner to be adequate to cover the penalties, damages, and potential losses resulting or likely to result from:

11.17.1 The quality of a portion, or all, of the Design/Builder's Work not being in accordance with the requirements of this Contract;

11.17.2 The quantity of the Design/Builder's Work not being as represented in the Design/Builder's pay request, or otherwise;

11.17.3 The Design/Builder's rate of progress being such that, in the Owner's opinion, Substantial Completion, Final Completion, or both, may be unexcusably delayed;

11.17.4 The Design/Builder's failure to use Contract funds, previously paid the Design/Builder by the Owner, to pay the Design/Builder's Project-related obligations including, but not limited to, Subcontractors, laborers and material and equipment Suppliers;

11.17.5 Evidence that the balance of the Work cannot be completed in accordance with the Contract for the unpaid balance of the Contract Price;

11.17.6 Claims made, or likely to be made, against Owner or its property;

11.17.7 Loss caused by the Design/Builder;

11.17.8 The Design/Builder's failure or refusal to perform any of its obligations to the Owner.

In the event that Owner makes written demand upon the Design/Builder for amounts previously paid by the Owner as contemplated in this Paragraph 11.17, the Design/Builder shall promptly comply with such demand.

11.18 Unexcused Failure To Pay: If the Owner, without cause or basis hereunder, fails to pay the Design/Builder any amounts due and payable to the Design/Builder within forty five (45) calendar days after the date established herein for payment of such amounts, then the Design/Builder may suspend its Design Services or, as applicable, the Work until payment is made, provided that the Design/Builder first gives ten (10) days' written notice to the Owner of its intent. Any payment due hereunder which is not made within forty five (45) calendar days after the date due shall bear interest at the rate prescribed by the State of Rhode Island Prompt Payment Law.

ARTICLE 12 - SUBSTANTIAL AND FINAL COMPLETION

12.1 Substantial Completion: "Substantial Completion" means that stage in the progression of the Work, as approved by the Owner in writing, when the Project is sufficiently complete in accordance with the Contract that the Owner can enjoy beneficial use or occupancy of the entire Project and can utilize it for all of its intended purposes. A condition precedent to Substantial Completion is the receipt by the Owner of all necessary certificates of occupancy or other authorizations for the use and occupancy of the Project required by any governmental or regulatory authority. The Owner reserves the right to occupy and use any part, phase or system of the Project when such part, phase or system is substantially completed, but such partial use or occupancy of the Project shall not result in the Project being deemed substantially complete, and such partial use or occupancy shall not be evidence of Substantial Completion.

12.2 Determination Of Substantial Completion: When the Design/Builder believes that the Work is substantially complete, the Design/Builder shall notify the Owner in writing and shall submit to the Owner a list of items remaining to be completed or corrected. The Owner will perform an inspection and if the Work is substantially complete in the opinion of the Owner, the Owner will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion. The Certificate of Substantial Completion shall state the responsibilities of the Owner and the Design/Builder for Project security, maintenance, heat, utilities, damage to the Work, and insurance, and shall fix the date, 30 days hence, within which the Design/Builder shall complete any items of incomplete or defective Work. The Certificate of Substantial Completion shall be submitted to the Design/Builder for its written acceptance of the responsibilities assigned to it in such certificate.

12.3 Payment Upon Substantial Completion: Upon Substantial Completion of the Work, and upon execution by both the Owner and the Design/Builder of the Certificate of Substantial Completion, Owner shall pay the Design/Builder, within forty five (45) calendar days, all sums due the Design/Builder, including retainage, less one hundred fifty percent (150%) of the reasonable costs as determined by the Owner for completing all incomplete Work and Design Services, correcting and bringing into strict conformance all defective and nonconforming Work, and handling all outstanding or threatened claims.

12.4 Final Completion: "Final Completion" means the completion of all Design Services and all Work required by, and in strict compliance with, the Contract, including Design/Builder's provision to the Owner of all documents and things required to be provided by the Contract.

12.5 Determination Of Final Completion: When the Design/Builder believes that all of the Work is finally complete, and the Design/Builder is ready for a final inspection, the Design/Builder shall so notify the Owner in writing. The Owner will then make final inspection of the Work and, if the Work is complete in strict accordance with the Contract, and the Contract has been fully performed, then the Owner will issue a Certificate for Final Payment, providing for payment of the remainder of the Contract Price, less any amount withheld pursuant to the Contract.

12.6 Payment After Final Completion: The Owner shall make final payment of all sums due the Design/Builder within forty five (45) calendar days after Final Completion as reflected by the Owner's Certificate for Final Payment, provided that all documents and things required to be delivered to the Owner hereunder have been delivered as required, and provided that all other conditions precedent to payment have been satisfied.

12.7 Conditions Precedent To Final Payment: Prior to being entitled to receive final payment, and as a condition precedent thereto, the Design/Builder shall furnish the Owner, in the form and manner required by the Owner, the following:

12.7.1 An affidavit that all of the Design/Builder's obligations to Subcontractors, laborers, equipment or material Suppliers, or other third parties in connection with the Project, have been paid or otherwise satisfied;

12.7.2 If required by the Owner, separate releases of lien or lien waivers from each Subcontractor, lower tier Subcontractor, laborer, Supplier or other person or entity who has, or might have a claim against the Owner or the Owner's property;

12.7.3 If applicable, consent(s) of surety to final payment;

12.7.4 A complete set of the as-built drawings and the record set of Contract Documents including as-built drawings in electronic format, AutoCad Version 2015 or newer.

12.7.5 All product warranties, operating manuals, instruction manuals and other record documents, drawings and things customarily required of a Design/Builder, or expressly required herein, as a part of or prior to Project closeout.

12.8 Acceptance Of Final Payment A Waiver: Acceptance by the Design/Builder of final payment shall constitute a waiver and release of all claims against the Owner by the Design/Builder except for those claims previously made in writing against the Owner by the Design/Builder, pending at the time of final payment and specifically identified on the Design/Builder's pay request for final payment as unsettled at the time it submits its pay request.

ARTICLE 13 - OWNER'S DUTIES, OBLIGATIONS, AND RESPONSIBILITIES

In addition to payment, Owner shall undertake to perform the following:

13.1 Provide Project Information: The Owner shall provide the Design/Builder with information regarding the Owner's requirements for the Project including any desired or required design or construction schedule.

13.2 Review Of Documents: The Owner shall review any documents submitted by the Design/Builder requiring the Owner's decision, and shall render any required decisions pertaining thereto.

13.3 Provide Notice Of Defects: In the event the Owner knows of any material fault or defect in the Work, nonconformance with the Contract, or of any errors, omissions or inconsistencies in the Design Documents, then the Owner shall give prompt notice thereof in writing to the Design/Builder.

13.4 Access To The Site And The Work: The Owner shall provide the Design/Builder access to the site and to the Work, and shall provide the Design/Builder with such information, existing and reasonably available, necessary to the Design/Builder's performance of the Contract as the Design/Builder may request.

13.5 Cooperation To Secure Permits, Licenses, Approvals, And Authorizations: The Owner shall cooperate with the Design/Builder in securing any necessary licenses, permits, approvals or other necessary authorizations for the design, construction and certification of the Project.

13.6 Timely Performance: The Owner shall perform the duties set forth in this Article 13 in a reasonably expeditious fashion so as to permit the orderly and timely progress of the Design/Builder's Design Services and of the Work.

13.7 Owner's Reviews, Inspections, Approvals, And Payments Not A Waiver: The Owner's review, inspection, or approval of any Work, Design Documents, Submittals, or pay requests by the Design/Builder shall be solely for the purpose of determining whether such Work and such documents are generally consistent with

the Owner's construction program and requirements. No review, inspection, or approval by the Owner of such Work or documents shall relieve the Design/Builder of its responsibility for the performance of its obligations under the Contract or the accuracy, adequacy, fitness, suitability, or coordination of its Design Services or the Work. Approval by any governmental or other regulatory agency or other governing body of any Work, Design Document, or Contract Documents shall not relieve the Design/Builder of responsibility for the strict performance of its obligations under the Contract. Payment by the Owner pursuant to the Contract shall not constitute a waiver of any of the Owner's rights under the Contract or at law, and the Design/Builder expressly accepts the risk that defects in its performance, if any, may not be discovered until after payment, including final payment, is made by the Owner.

13.8 Delay Or Forbearance Not Waiver: The Owner's agreement not to exercise, or its delay or failure to exercise, any right under the Contract or to require strict compliance with any obligation of the Design/Builder under the Contract shall not be a waiver of the right to exercise such right or to insist on such compliance at any other time or on any other occasion.

13.9 Documents Requested By Design/Builder: The Owner shall furnish to the Design/Builder, prior to the execution of this Agreement, any and all written and tangible material knowingly in its possession concerning conditions at the site of the Project. Such written and tangible material is furnished to the Design/Builder only in order to make complete disclosure of such material and for no other purpose. By furnishing such material, the Owner does not represent, warrant, or guarantee its accuracy or completeness either in whole or in part, and shall have no liability therefor. If the Design/Builder requests in writing, the Owner shall also furnish surveys, legal limitations, and utility locations (if known), and a legal description of the Project site. Drawings used in the bridging documents are available upon request in Autodesk Revit or Autocad formats.

13.10 Approvals And Easements: The Owner shall obtain all easements required for construction, and shall pay for necessary assessments and charges required for use and occupancy of the Work. The Design/Builder shall render such assistance as the Owner may request in obtaining such easements, certificates of occupancy, and the like.

13.11 Right To Stop Work: In the event the Design/Builder fails or refuses to perform the Work in strict accordance with the Contract, or is otherwise in breach of this Contract in any way, the Owner may, at its option, instruct the Design/Builder to cease and desist from performing further Work, or any part thereof. Upon receipt of such instruction from the Owner in writing, the Design/Builder shall immediately cease and desist as instructed by the Owner and shall not proceed further until the cause for the Owner's instructions has been corrected, no longer exists, or the Owner instructs that the Work may resume.

13.12 Owner's Right To Perform Work: In the event the Owner issues such instructions to stop Work, and in the further event that the Design/Builder fails and refuses within seven (7) days of receipt of same to provide adequate assurance to the Owner that the cause of such instructions will be eliminated or corrected, then the Owner shall have the right to carry out the Work with its own forces, or with the forces of other Design/Builders, and the Design/Builder shall be fully responsible for the costs incurred in performing such Work. The rights set forth in Paragraph 13.11 and this Paragraph 13.12 are in addition to, and without prejudice to, any other rights or remedies the Owner may have against the Design/Builder, including the rights to terminate or withhold payment as provided herein.

13.14 Owner's Representative: "Owner's Representative" means the individual named by the Owner, in writing, to act on the Owner's behalf in the administration of the Contract.

ARTICLE 14 - PROJECT DOCUMENTATION

14.1 Maintenance Of Project-Related Records: The Design/Builder shall maintain and protect all records relating in any manner whatsoever to the Project (the "Project Records") for no less than four (4) years after Final Completion of the Project, and for any longer period of time as may be required by law or good management practice.

14.2 Availability Of Project-Related Records To Owner: All Project Records which are in the possession of the Design/Builder or the Design/Builder's Subcontractors shall be made available to the Owner for inspection and copying upon the Owner's request at any time. Additionally, such records shall be made available upon request by the Owner to any state, federal or other regulatory authorities and any such authority may review, inspect and copy such records. The Project Records include, without limitation, all drawings, plans, specifications, Submittals, correspondence, logs, minutes, memoranda, photographs, tape or videotape recordings, or other writings or things which document the Project, its design, or its construction. Said records include those documents reflecting the cost of design and construction to the Design/Builder.

ARTICLE 15 - PERSONNEL, SUBCONTRACTORS AND SUPPLIERS

15.1 Subcontractor Defined: A "Subcontractor" means an entity which has a direct contract with the Design/Builder to perform a portion of the Work or the Design Services. For purposes of the Contract, Subcontractors shall also include those furnishing specially fabricated equipment and materials for the Project.

15.2 Supplier Defined: A "Supplier" means an entity providing only equipment or materials for the performance of the Work.

15.3 Objections To Subcontractors: Upon execution of this Agreement, and at such later times as may be applicable, the Design/Builder shall furnish the Owner, in writing, the names of persons or entities proposed by the Design/Builder to act as Subcontractors on the Project. The Design/Builder shall provide such information regarding such proposed Subcontractors as the Owner deems necessary. The Owner shall promptly reply to the Design/Builder, in writing, stating any objections the Owner may have to such proposed Subcontractors. The Design/Builder shall not enter into a subcontract with an intended Subcontractor with reference to whom the Owner objects. Any consent or failure to reject by the Owner shall in no way relieve the Design/Builder of any of its duties or warranties under the Contract.

15.4 Terms Of Subcontracts: All subcontracts and purchase orders with Subcontractors shall afford the Design/Builder rights against the Subcontractor which correspond to those rights afforded to the Owner against the Design/Builder herein, including those rights of Contract suspension, termination, and stop Work orders as set forth herein. It is expressly agreed that no relationship of agency, employment, contract, obligation or otherwise shall be created between the Owner and any Subcontractor of the Design/Builder and a provision to this effect shall be inserted into all agreements between the Design/Builder and its Subcontractors.

15.5 Design/Builder Responsible For Acts Of Its Subcontractors: Should the Design/Builder subcontract all or any part of the Work, such subcontracting of the Work shall not relieve the Design/Builder from any liability or obligation under the Contract or under any applicable policy, law or regulation, and the Design/Builder shall be responsible for all and any acts, defaults, omissions or negligence of its Subcontractors, Suppliers, and consultants.

15.6 Personnel: In accordance with Article 2 above, the Design/Builder shall employ and assign only qualified and competent personnel to perform any service or task concerning the Project. The Design/Builder shall designate one such person as the Project Manager. Absent written instruction from the Design/Builder to the contrary, the Project Manager shall be deemed to be the Design/Builder's authorized representative and shall

be authorized to receive and accept any and all communications from the Owner. Key design and supervisory personnel assigned by the Design/Builder to this Project are as follows:

NAME	FUNCTION
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Evidence of the above-named personnel's competence, such as a resume, shall be provided to the Owner prior to said personnel beginning performance of the function indicated. So long as the individuals named above remain actively employed or retained by the Design/Builder, or any related entity or affiliate thereof, they shall perform the functions indicated next to their names unless the Owner agrees to the contrary in writing or unless the Owner requests removal of any such individual from the Project. In the event the Owner requests the removal of any of the individuals named above, the Design/Builder shall immediately comply and shall immediately replace such individual with a qualified substitute to whom the Owner makes no objection. In the event one or more individuals not listed above subsequently assumes one or more of those functions listed above, the Design/Builder shall be bound by the provisions of this Paragraph 15.6 as though such individuals had been listed above.

15.7 Removal Of Subcontractors And Personnel: If, at any time during the course of the Project, the Owner reasonably determines that the performance of any Subcontractor or any member of the Design/Builder's staff working on the Project is unsatisfactory, the Owner's Representative may require the Design/Builder to remove such Subcontractor or staff member from the Project immediately and replace the staff member at no cost or penalty to Owner for delays or inefficiencies the change may cause.

ARTICLE 16 - CHANGES AND EXTENSIONS OF TIME

16.1 Owner's Right To Order Changes: Changes in the Design Services or the Work within the general scope of the Contract, consisting of additions, deletions, revisions or any combination thereof, may be ordered unilaterally by the Owner without invalidating the Contract. Such changes shall be communicated by Change Order or by Field Order. The Design/Builder shall proceed diligently with any changes, and same shall be accomplished in strict accordance with the following terms and conditions as set forth in this Article 16.

16.2 Definition Of Change Order: "Change Order" shall mean a written order to the Design/Builder executed by Owner, issued after execution of this Agreement, authorizing and directing a change in the Design Services or the Work, an adjustment to the Contract Price or the Contract Time, or any combination thereof. The Contract Price and the Contract Time may be changed only by Change Order.

16.3 Adjustments To Contract Price Or Contract Time: Upon the occurrence of a change as set forth in Paragraph 16.1, the adjustment, if any, to the Contract Price or the Contract Time resulting;

16.3.1 By mutual agreement between the Owner and the Design/Builder as evidenced from the change shall be determined as follows, by:

16.3.1.1 the change in the Contract Price, the Contract Time, or both, being set forth in a Change Order,

16.3.1.2 such change, together with any conditions or requirements relating thereto, being initialed by both parties, and

16.3.1.3 the Design/Builder's execution of the Change Order; or

16.3.2 If no mutual agreement occurs between the Owner and the Design/Builder, then the change in the Contract Price, if any, shall be established on the basis of, and shall be limited to, the reasonable expenditures or savings, as defined below, resulting from the change. Such reasonable expenditures or savings shall include a component for direct jobsite overhead and profit, but shall not include home office overhead or other indirect costs or components. Any such expenditures or savings shall be documented in such form and with such content and detail as the Owner may require. Reasonable expenditures or savings shall be limited to the following:

16.3.2.1 Actual, reasonable costs of Design Services, supervision, materials, supplies or equipment including delivery costs;

16.3.2.2 Actual, reasonable costs of Design Services, supervision, labor, plus social security, unemployment insurance, fringe benefits required by agreement or custom, and worker's compensation insurance;

16.3.2.2.1 Actual, reasonable rental costs of machinery and equipment (exclusive of small tools or hand tools) whether rented from the Design/Builder or others;

16.3.2.4 Actual, reasonable costs of premiums for bonds, permit fees, and sales, use or other taxes related to the Work.

In no event shall any expenditure or savings associated with the Design/Builder's home office or indirect overhead expense be included in any Change Order.

16.3.3 Any extension of the Contract Time requested by the Design/Builder for performance of any change in the Design Services or the Work ordered by Owner may be granted by mutual agreement and then set forth in the Change Order. Otherwise, extensions of the Contract Time must be requested by the Design/Builder pursuant to the terms and conditions of Article 17 of this Agreement, and any such request for extension of the Contract Time shall be subject to Paragraph 16.7 of this Agreement. The failure of the Design/Builder to provide notice in writing to the Owner in accordance with Article 17 of this Agreement of any request for extension of the Contract Time shall constitute a waiver by the Design/Builder of any entitlement to an extension of the Contract Time.

16.4 Continuing Duty To Perform Work And Make Payment: In the event the parties are unable to agree on the terms of a Change Order, then the Design/Builder shall continue to diligently perform the Design Services and the Work, including any change directed by Owner by Change Order, and shall keep thorough records of the cost of performance of such Change Order consistent with and in accordance with the provisions of Paragraph 16.3.2 above. Pending final determination of reasonable expenditures or savings, payments on account shall be made to the Design/Builder in accordance with said Paragraph 16.3.2 and Article 11 herein.

16.5 Changes In Unit Prices: If unit prices are provided in the Contract, and if the quantities contemplated are changed in a proposed Change Order such that an application of the unit prices to the quantities of Work

proposed will cause substantial inequity to the Owner or to the Design/Builder, the applicable unit prices shall be equitably adjusted.

16.6 Minor Changes: The Owner shall have authority to order minor changes in the Work not involving a change in the Contract Price nor extension of the Contract Time and not inconsistent with the intent of the Contract. Such minor changes shall be made by written Field Order, and the Design/Builder shall promptly carry out such written Field Orders.

16.7 Effect Of Executed Change Order: The execution of a Change Order by the Design/Builder shall constitute conclusive evidence of the Design/Builder's agreement to the ordered changes in the Design Services or the Work, the Contract as thus amended, the Contract Price as thus amended and the Contract Time as thus amended. The Design/Builder, by executing the Change Order, waives and releases any claim against the Owner for additional time or compensation for matters relating to, arising out of, or resulting from the Design Services or the Work included within or affected by the executed Change Order.

16.8 Consent Of Surety: The Design/Builder shall notify and obtain the consent and approval of the Design/Builder's surety with reference to all Change Orders if such notice, consent or approval are required by the Owner, the Design/Builder's surety or by law. The Design/Builder's execution of the Change Order shall constitute the Design/Builder's warranty to the Owner that the surety has been notified of, and consents to, such Change Order and the surety shall be conclusively deemed to have been notified of such Change Order and to have expressly consented thereto.

16.9 Fiduciary Relationship: The Design/Builder recognizes and accepts a fiduciary relationship of trust and confidence hereby established between the Design/Builder and the Owner and agrees that it shall at all times in good faith use its best efforts to advance the Owner's interests and agrees to perform the Design Services and the Work in the best professional manner.

ARTICLE 17 - CLAIMS BY DESIGN/BUILDER

17.1 Terms And Conditions Of Claims: Claims by the Design/Builder against the Owner are subject to the terms and conditions of this Article 17, and strict compliance herewith shall be a condition precedent to any liability of the Owner therefor.

17.2 Notice Of Claim: All the Design/Builder claims, disputes and other matters in question against the Owner arising out of or related to the Contract or the breach thereof, including without limitation claims in respect of changes in the Contract Price or Contract Time, shall be initiated by a written notice of claim submitted to the Owner. Such written notice of claim shall be received by the Owner no later than seven (7) days after the event, or the first appearance of the circumstances, causing the claim, and same shall set forth in detail all known facts and circumstances supporting the claim including the amount claimed. The Design/Builder agrees and acknowledges that its failure to provide written notice of a claim as set forth herein shall constitute a waiver of any claim for additional compensation or time extension related thereto.

17.3 Documentation In Support Of Claims: Upon discovering an event or condition forming the basis of a claim for an increase in the Contract Price or an extension of the Contract Time, the Design/Builder shall, until the claim is resolved, commence to maintain separate records evidencing all costs and delays incurred in connection with the event or condition forming the basis for the claim.

17.4 Formal Written Claim: No later than thirty (30) days after the date of the written notice of claim, the Design/Builder shall submit a formal written claim which shall include at least the following information:

- 17.4.1** a concise statement of the occurrence(s) supporting the claim, dispute or other matter, and the relief sought;
- 17.4.2** identification of the facts giving rise to the claim dispute or other matter;
- 17.4.3** the date the Design/Builder discovered the occurrence(s);
- 17.4.4** a detailed schedule of values identifying all costs resulting from the claim, dispute or other matter;
- 17.4.5** documentation supporting the schedule of values;
- 17.4.6** identification of any impact the claim, dispute or other matter has on the critical path schedule; and
- 17.4.7** all correspondence, internal memoranda, progress notes, and other documentation relating to the events which form the basis of the claim, dispute or other matter. Other information or documents shall be submitted to the Owner within ten (10) days after written request by the Owner. The failure to provide a claim as set forth herein, or the failure to provide such other documents or information requested by the Owner within ten (10) days after the written request shall constitute a waiver of any claim for additional compensation or time extension related thereto.
- 17.5 Continuous Duty To Provide Documentation:** The Design/Builder shall provide, and continue to provide, to the Owner all such documentation, including cost and time records, as and when the Owner may request so that the Owner may evaluate the Design/Builder's claim.
- 17.6 Duty To Continue Performance:** The Design/Builder and the Owner shall continue their performance hereunder regardless of the existence of any claims submitted by the Design/Builder.
- 17.7 Differing Site Conditions:** In the event the Design/Builder discovers previously concealed and unknown site conditions which are materially at variance from those typically and ordinarily encountered in the general geographical location of the Project, and not reasonably discoverable by the Design/Builder's diligent inspections as required herein, the Contract Price shall be modified, either upward or downward, upon the written claim made by either party within seven (7) calendar days after the first appearance to such party of the circumstances. As a condition precedent to the Owner having any liability to the Design/Builder due to concealed and unknown conditions, the Design/Builder must give the Owner written notice of, and an opportunity to observe, such condition prior to disturbing it. The failure of the Design/Builder to give the written notice and make the claim as provided by this Paragraph 17.7 shall constitute a waiver by the Design/Builder of any rights arising out of or relating to such concealed and unknown condition including any claim for an increase in the Contract Price or any claim for an extension of the Contract Time.
- 17.8 Claims For Increase In Contract Price:** In the event the Design/Builder seeks to make a claim for an increase in the Contract Price, as a condition precedent to any liability of the Owner therefor, the Design/Builder shall strictly comply with the requirements of Paragraph 17.2 above and such notice shall be given by the Design/Builder before proceeding to execute any additional or changed Work. Failure of the condition precedent to occur shall constitute a waiver by the Design/Builder of any claim for additional compensation.
- 17.9 Limit Of Owner's Liability For Increased Costs:** In connection with any claim by the Design/Builder against the Owner for compensation in excess of the Contract Price, any liability of the Owner;
- 17.9.1** shall be strictly limited to direct cost actually and reasonably incurred by the Design/Builder in accordance with the provisions regarding changes in the Contract Price as set forth in Paragraph 16.3.2, and

17.9.2 shall in no event include, indirect, consequential, impact or other costs, expenses or damages of the Design/Builder or its Subcontractors. The Owner shall not be liable to Design/Builder for claims of third parties, including Subcontractors, for acts, omissions, events, or conditions for which the Owner would not be liable to the Design/Builder under the terms of the Contract. As a condition precedent to the Owner's liability to the Design/Builder for any loss or damage resulting from claims of third parties, including Subcontractors, such third parties must have complied with all conditions contained in their agreements with the Design/Builder and such Subcontractor's claims must have been submitted to the Owner by the Design/Builder in strict compliance with all the requirements of this Article 17. The Owner shall not be liable to the Design/Builder for claims of third parties including Subcontractors, unless and until the liability of the Design/Builder therefor has been established in a court of competent jurisdiction.

17.10 Claims For Increase In Contract Time: If the Design/Builder is delayed in progressing any task which at the time of the delay is then critical or which during the delay becomes critical, as the sole result of any act or neglect to act by the Owner or someone acting in the Owner's behalf, or by changes ordered in the Design Services or the Work, unusually bad weather not reasonably anticipatable, fire or other Acts of God, then the date for achieving Substantial Completion, or, as applicable, Final Completion, shall, subject to the provisions of Paragraph 17.11 below, be appropriately adjusted by the Owner upon the written notice and claim of the Design/Builder to the Owner for such reasonable time as the Owner may determine. A task is critical within the meaning of this Paragraph 17.10 if, and only if, said task is on the critical path of the Project schedule so that a delay in performing such task will delay the ultimate completion of the Project. As a condition precedent to any right to an extension of time, the Design/Builder shall strictly comply with the requirements of Paragraph 17.2 above and such notice shall be given by the Design/Builder before proceeding to execute any additional or changed Design Services or Work. If the Design/Builder fails to give such notice, any claim for an extension of time shall be waived. In the event the delay to the Design/Builder is a continuing one, only one notice and claim for additional time shall be necessary, provided the continuing nature of the delay is indicated in the notice and claim.

17.10 Owner's Right To Order Acceleration And To Deny Claimed And Appropriate Time Extensions, In Whole Or In Part: The Design/Builder acknowledges and agrees that Substantial Completion of the Work by or before the Scheduled Completion Date is, or may be, of substantial importance to the Owner.

17.10.1 The Owner shall accordingly have the right in its sole discretion to order the Design/Builder to accelerate its progress in such a manner as to achieve Substantial Completion on or before such date as Owner may reasonably direct and, upon receipt, the Design/Builder shall comply with such order.

17.10.2 In the event that the Design/Builder is otherwise entitled to an extension of Contract Time and has made claim therefor in accordance with Paragraph 17.10 above, the Owner shall have the right in its sole discretion to deny all, or any part, of such extension of Contract Time by written notice to the Design/Builder provided within seven (7) days of receipt of the Design/Builder's claim. Should the Owner deny the Design/Builder's claim for an extension of Contract Time under this Subparagraph 17.10.2, either in whole or in part, the Design/Builder shall proceed to prosecute the Work in such a manner as to achieve Substantial Completion on or before the then existing Scheduled Completion Date.

17.10.3 In the event that

17.10.3.1 The Owner orders the Design/Builder to accelerate its progress under Subparagraph 17.11.1 above, or

17.10.3.2 The Owner exercises its rights under Subparagraph 17.11.2 above, or

17.10.3.3 both, such action shall be deemed to constitute a Change Order under Article 16 and any change in the Contract Price shall be determined in accordance therewith.

17.11 Claims Resolved By Change Order: The resolution of any claim under this Article 17 shall be reflected by a Change Order executed by the Owner and the Design/Builder.

17.12 Mediation

17.12.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract shall be subject to mediation as a condition precedent to binding dispute resolution.

17.12.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

17.12.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

17.13 Arbitration

17.13.1 Any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

17.13.2 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

17.13.3 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

17.13.4 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

ARTICLE 18 - UNCOVERING AND CORRECTING WORK

18.1 Design/Builder Not To Cover Work Contrary To Requirements: If any of the Work is covered, concealed or obscured contrary to the written request of the Owner, or contrary to any provision of the Contract, said Work shall, if required by the Owner, be uncovered for inspection and shall be properly replaced at the Design/Builder's expense without change in the Contract Time.

18.2 Owner's Right To Order Uncovering Of Any Work: If any of the Work is covered, concealed or obscured in a manner not inconsistent with Paragraph 18.1 above, it shall, if required by the Owner, be uncovered for inspection. If such Work conforms strictly to the Contract, the cost of uncovering and proper replacement shall by Change Order be charged to Owner. If such Work does not strictly conform to the Contract, Design/Builder shall pay the cost of uncovering and proper replacement.

18.3 Duty To Correct Rejected Work: The Design/Builder shall immediately proceed to correct Work rejected by the Owner as defective or failing to conform to the Contract. The Design/Builder shall pay all costs and expenses associated with correcting such rejected Work, including any additional testing and inspections made necessary thereby.

18.4 Duty To Correct Defective Work Discovered After Completion: In addition to its warranty obligations set forth elsewhere herein, the Design/Builder shall be specifically obligated to correct any and all defective or nonconforming Work for a period of twelve (12) months following Final Completion upon written direction from the Owner. This obligation shall survive final payment by the Owner and termination of the Contract.

18.5 No Period Of Limitation Established: Nothing contained in Paragraph 18.4 shall establish any period of limitation with respect to other obligations which the Design/Builder has under the Contract. Establishment of the one-year time period in Paragraph 18.4 above relates only to the duty to the Design/Builder to specifically correct the Work.

18.6 Owner's Option To Accept Defective Work: Owner may, but shall in no event be required to, choose to accept defective or nonconforming Work. In such event, the Contract Price shall be reduced by the reasonable costs of removing and correcting the defective or nonconforming Work. The Owner shall be entitled to such reduction in the Contract Price regardless of whether the Owner has, in fact, removed and corrected such defective Work. If the unpaid balance of the Contract Price, if any, is insufficient to compensate the Owner for the acceptance of defective or nonconforming Work, the Design/Builder shall, upon written demand from the Owner, pay the Owner such additional compensation for accepting defective or nonconforming Work.

ARTICLE 19 - SUSPENSION AND TERMINATION

19.1 Suspension Of Performance: The Owner may for any reason whatsoever suspend performance under the Contract. The Owner shall give written notice of such suspension to the Design/Builder specifying when such suspension is to become effective.

19.2 Ceasing Performance Upon Suspension: From and upon the effective date of any suspension ordered by the Owner, the Design/Builder shall incur no further expense or obligations in connection with the Contract, and the Design/Builder shall cease its performance. The Design/Builder shall also, at the Owner's direction, either suspend or assign to the Owner any of its open or outstanding subcontracts or purchase orders.

19.3 Claim For Costs Of Suspension: In the event the Owner directs a suspension of performance under this Article 19, through no fault of the Design/Builder, and provided the Design/Builder submits a proper claim as provided in this Agreement, the Owner shall pay the Design/Builder as full compensation for such suspension Design/Builder's reasonable costs, actually incurred and paid, of:

19.3.1 Demobilization and remobilization, including such costs paid to Subcontractors;

19.3.2 Preserving and protecting Work in place;

19.3.3 Storage of materials or equipment purchased for the Project, including insurance thereon;

19.3.4 Performing in a later, or during a longer, time frame than that contemplated by this Contract.

19.4 Resumption Of Work After Suspension: If the Owner lifts the suspension it shall do so in writing, and the Design/Builder shall promptly resume performance of the Contract unless, prior to receiving the notice to resume, the Design/Builder has exercised its right of termination as provided herein.

19.5 Termination By Design/Builder For Prolonged Suspension Of Performance: If performance of this Contract is stopped for a period of ninety (90) consecutive days at the direction of the Owner pursuant to Paragraph 19.1 or by an order of any court or other public authority, or as a result of any act of the Government, and provided that such suspension by Owner or public authority is through no fault of the Design/Builder or any person or entity working directly or indirectly for the Design/Builder, the Design/Builder may, upon ten (10) days' written notice to the Owner, terminate performance under the Contract and recover from the Owner on the terms and conditions and in the amounts provided in Paragraph 19.8 below.

19.6 Termination By Design/Builder For Cause: If the Owner shall persistently or repeatedly fail to perform any material obligation to the Design/Builder for a period of thirty (30) days after receiving written notice from the Design/Builder of its intent to terminate hereunder, the Design/Builder may terminate performance under the Contract by written notice to the Owner. In such event, the Design/Builder shall be entitled to recover from the Owner on the terms and conditions and in the amounts as though the Owner had terminated the Design/Builder's performance under the Contract for convenience pursuant to Paragraph 19.7 below.

19.7 Termination By Owner For Convenience: The Owner may, for any reason whatsoever, or without reason, terminate performance under the Contract by the Design/Builder for convenience. The Owner shall give written notice of such termination to the Design/Builder specifying when termination becomes effective. The Design/Builder shall incur no further obligations in connection with the Contract and the Design/Builder shall stop Design Services and the Work when such termination becomes effective. The Design/Builder shall also, at the Owner's direction, either terminate or assign to the Owner outstanding orders and subcontracts. The Design/Builder shall settle the liabilities and claims arising out of any terminated subcontracts and orders. The Owner may direct the Design/Builder to assign the Design/Builder's right, title and interest under terminated orders or subcontracts to the Owner or its designee. The Design/Builder shall transfer title and deliver to the Owner such completed or partially completed Design Documents, Work and materials, equipment, parts, fixtures, information and Contract rights as the Design/Builder has.

19.8 Submission Of Termination Claim And Compensation For Termination For Convenience: When terminated for convenience, the Design/Builder shall be compensated as follows:

19.8.1 The Design/Builder shall submit a termination claim to the Owner specifying the amounts believed to be due because of the termination for convenience together with costs, pricing or other data required by the Owner. If the Design/Builder fails to file a termination claim within three (3) months from the effective date of termination, the Owner shall pay the Design/Builder an amount derived in accordance with Subparagraph 19.8.3 below;

19.8.2 The Owner and the Design/Builder may agree to the compensation, if any, due to the Design/Builder hereunder;

19.8.3 Absent agreement to the amount due to the Design/Builder, the Owner shall pay the Design/Builder, as full compensation for termination for convenience, the following amounts:

19.8.3.1.1 That portion of the Contract Price representing the value of the Design Services and the Work, as reflected on the Schedule of Values, performed by the Design/Builder prior to its receipt of the notice of termination, which is completed and accepted by the Owner for which the Design/Builder has not been previously paid;

19.8.3.2 Reasonable costs incurred in preparing to perform and in performing the terminated portion of the Design Services and the Work, and in terminating the Design/Builder's performance, plus a fair and reasonable allowance for direct jobsite overhead and profit thereon (such profit shall not include anticipated profit or consequential damages); provided however, that if it appears that the Design/Builder would have not profited or would have sustained a loss if the entire Contract would have been completed, no profit shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss, if any;

19.8.3.3 Reasonable costs of settling and paying claims arising out of the termination of subcontracts or orders pursuant to Paragraph 19.7 above. These costs shall not include amounts paid in accordance with other provisions hereof. In no event shall the Design/Builder be entitled to recover anticipated profits or other consequential damages from the Owner on account of a termination for convenience or an erroneous termination for cause, as described below. The total sum to be paid the Design/Builder under this Paragraph shall not exceed the Contract Price, as properly adjusted, reduced by the amount of payments otherwise made, and shall in no event include duplication of payment.

19.9 Termination By Owner For Cause: If the Design/Builder does not perform the Work, or any part thereof, in a timely manner, supply adequate labor, supervisory personnel or proper equipment or materials, or if it fails to timely discharge its obligations for labor, equipment and materials, or proceeds to disobey applicable laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise commits a violation of a material provision of the Contract, then the Owner may by written notice to the Design/Builder, without prejudice to any other right or remedy against the Design/Builder or others, terminate the performance of the Design/Builder and take possession of the Project site and of all materials and equipment at the site and may finish the Work by whatever methods it may deem expedient. In such cases, the Design/Builder shall not be entitled to receive any further payment until the Work is finished.

19.10 Erroneous Termination For Cause: In the event the employment of the Design/Builder is terminated by the Owner for cause pursuant to Paragraph 19.9 and it is subsequently determined by a court or other tribunal of competent jurisdiction that such termination was without cause, such termination shall thereupon be deemed a Termination for Convenience under Paragraph 19.7 and the provisions of Paragraph 19.8 regarding compensation shall apply.

19.11 Payments To Design/Builder After Termination For Cause: If the unpaid balance of the Contract Price exceeds the costs of finishing the Work, including compensation for the Owner's additional costs and expenses of every nature whatsoever made necessary thereby, such excess shall be paid to the Design/Builder. If such costs exceed the unpaid balance, the Design/Builder shall pay the difference to the Owner. This obligation for payment shall survive the termination of the Agreement.

ARTICLE 20 - OWNERSHIP OF DOCUMENTS

20.1 Documents Owner's Property: The Design Documents and the Contract Documents, including but not limited to, the drawings, specifications and other documents or things prepared by the Design/Builder for the Project, shall immediately become and be the sole property of the Owner. Any documents furnished by the

Owner shall remain the property of the Owner. The Design/Builder may be permitted to retain copies of the Design Documents and Contract Documents and any documents furnished by the Owner for its records with approval in writing of the Owner; provided, however, that in no event shall the Design/Builder use, or permit to be used, any portion of all of such documents on other projects without the Owner's prior written authorization.

ARTICLE 21 - INDEMNITY

21.1 From Personal Injury Or Damage To Tangible Property: The Design/Builder shall indemnify and hold the Owner harmless from any and all claims, liability, damages, loss, cost and expense of every type whatsoever including, without limitation, attorneys' fees and expenses, in connection with the Design/Builder's performance of this Contract, provided that such claims, liability, damage, loss, cost or expense is due to sickness, personal injury, disease or death, or to loss or destruction of tangible property (other than the Work itself), including loss of use resulting therefrom, to the extent caused by the Design/Builder or anyone for whose acts the Design/Builder may be liable, regardless of whether such liability, claim, damage, loss, cost or expense is caused in part by the Owner.

21.2 From Violations Of Laws, Environmental Requirements, Performance Guidelines, And Licensing Requirements: The Design/Builder shall indemnify and hold harmless the Owner and its affiliates, officers, directors, and employees from and against all claims, liabilities, damages, losses, costs, expenses (including reasonable attorney's fees and expenses, and fees and expenses of experts) for bodily injury, including death, or damage to or loss of property, or any other type or form of loss occurring or sustained or resulting from:

21.2.1 Any violation by the Design/Builder, its Subcontractors, representatives, employees, and agents of any municipal, state or federal laws, rules, or regulations applicable to the performance of its obligations under the Contract;

21.2.2 Environmental violations or contamination from hazardous substances, hazardous wastes and emissions or other substances or chemicals regulated by any applicable environmental laws or regulations and resulting from any willful misconduct, negligent act or omission, or legal violation by the Design/Builder, its Subcontractors, Suppliers, representatives, employees, or agents;

21.2.3 The failure of any of the Design/Builder's employees, agents, representatives, Suppliers, or Subcontractors to obtain and maintain the required skills, licenses, certificates and permits mandated by applicable federal, state or local governing authorities with jurisdiction over construction, fabrication, environmental, health and safety matters or the Project.

21.3 Hazardous Materials: In the event the Design/Builder discovers hazardous or contaminated materials, including but not limited to asbestos, PCBs, petroleum, hazardous waste, or radioactive material, the Design/Builder shall stop all Work in connection with such hazardous condition and in any area affected thereby, and notify the Owner of the discovery of said condition. The Design/Builder shall strictly comply with all applicable laws, regulations, rules or other promulgations by governing bodies, agencies, authorities or organizations having jurisdiction over the Project or the discovery of said hazardous or contaminated material. The Design/Builder shall secure the Work site to prevent access by unauthorized personnel. If the Design/Builder fails to comply with this Paragraph 21.3 or contaminated, hazardous or suspected contaminated or hazardous material is transported (either on or off site) without notice to the Owner, such materials shall become the property of the Design/Builder and the Design/Builder shall be solely responsible for all costs and fines associated therewith.

ARTICLE 22 - INSURANCE

22.1 DESIGN/BUILDER'S LIABILITY INSURANCE

22.1.1 The Design/Builder shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Design/Builder from claims set forth below which may arise out of or result from the Design/Builder's operations under the Contract and for which the Design/Builder may be legally liable, whether such operations be by the Design/Builder or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- .1** claims under workers' compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed;
- .2** claims for damages because of bodily injury, occupational sickness or disease, or death of the Design/Builder's employees;
- .3** claims for damages because of bodily injury, sickness or disease, or death of any person other than the Design/Builder's employees;
- .4** claims for damages insured by usual personal injury liability coverage;
- .5** claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- .6** claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
- .7** claims for bodily injury or property damage arising out of completed operations; and
- .8** claims involving contractual liability insurance applicable to the Design/Builder's obligations.
- .9** liability Insurance shall include all major divisions of coverage and be on a comprehensive basis including:
 - 1.** Premises Operation (including X, C. and U coverages as applicable).
 - 2.** Independent Design/Builder's Protective.
 - 3.** Products and completed Operations.
 - 4.** Personal Injury Liability with Employment Exclusion deleted.
 - 5.** Contractual, including specified provision for Design/Builder's obligation.
 - 6.** Owner, non-owned and hired motor vehicles.
 - 7.** Broad Form Property Damage, including Completed Operations.
- .10** If the general liability coverages are provided by a General Liability Policy on a claims-made basis, the policy date or retroactive date shall predate the Contract; the termination date of the policy, or applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment in accordance with Article 12.

22.1.2 The insurance required by Subparagraph 22.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from date of commencement of the Work until date of final payment and termination of any coverage required to be maintained after final payment.

22.1.2.1 The insurance required by Subparagraph 22.1.1 shall be written for not less than the following limits, or greater, if required by law:

- 1. Workers' Compensation:**
 - a.** State - Statutory;
 - b.** Employer's Liability - \$500,000.
- 2. Comprehensive General Liability (including Premises/Operations; Independent Design/Builder's Protective; Products and Completed Operations; Broad Form Property Damage):**
 - a.** Bodily Injury: \$1,000,000 - Each Occurrence;
\$1,000,000 - Annual Aggregate.
 - b.** Property Damage: \$1,000,000 - Each Occurrence;
\$1,000,000 - Annual Aggregate.
 - c.** Products and Completed Operations to be Maintained for 2 Years After Final Payment.
 - d.** Property Damage Liability Insurance to Provide X, C. or U Coverage as Applicable.
- 3. Contractual Liability:**
 - a.** Bodily injury: \$1,000,000 - Each Occurrence;
\$1,000,000 - Annual Aggregate.
- 4. Personal Injury, with Employment Exclusion Deleted:**
 - a.** \$1,000,000 - Annual Aggregate.
- 5. Comprehensive Automobile Liability:**
 - a.** Bodily Injury: \$500,000 - Each person;
\$1,000,000 - Each Occurrence.
 - b.** Property Damage: \$500,000 - Each Occurrence.
- 6. Professional Liability covering negligent acts, errors and omissions in the performance of professional services, with policy limits of not less than \$1,000,000 each occurrence and \$1,000,000 in the aggregate.**

22.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These certificates and the insurance policies required by this Paragraph 22.1 shall contain a provision that coverage's afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. If any of the foregoing insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment as required by Article 12. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Design/Builder with reasonable promptness in accordance with the Design/Builder's information and belief.

22.1.3.1 The Design/Builder shall furnish one copy of each Certificate of Insurance herein required for each copy of the Agreement which shall specifically set forth evidence of coverage required by Subparagraphs 22.1.1, 22.1.2, and 22.1.3. If this insurance is written on a Comprehensive General Liability policy form, ACCORD Form 25S will be acceptable. The Design/Builder shall furnish copies of endorsement to the Owner that are subsequently issued amending coverage or limits.

22.2 OWNER'S LIABILITY INSURANCE

22.2.1 The Design/Builder shall furnish the Owner an insurance certificate providing Owner's Protective Liability, and to protect the Owner from any liability which might be incurred against them as a result of any operation of the Design/Builder or Design/Builder's Subcontractors or their employees. Such insurance shall be written for the same limits as the Design/Builder's liability insurance and shall include the same coverage

22.3 PROPERTY INSURANCE

22.3.1 The Design/Builder shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Article 12 or until no person or entity other than the Owner has an insurable interest in the property required by this Paragraph 22.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Design/Builder, Subcontractors and Sub-Subcontractors in the Project. The form of policy for this coverage shall be Completed Value. If the Owner is damaged by failure of the Design/Builder to maintain such insurance, then the Design/Builder shall bear all reasonable costs properly attributed thereto.

22.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Design/Builder's services and expenses required as a result of such insured loss.

22.3.1.2 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

22.3.1.3 Partial occupancy or use in accordance with Article 12 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Design/Builder shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

22.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Subparagraph 11.3.4 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

22.3.3 Before an exposure to loss may occur, the Design/Builder shall file with the Owner two certified copies of the policy or policies providing this Property Insurance coverage, each containing these endorsements specifically related to the Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire until at least 30 days prior written notice has been given to the Design/Builder.

22.3.4 Waivers of Subrogation: The Owner and Design/Builder waive all rights against (1) each other and any of their Subcontractors, sub-Subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate Design/Builders, if any, and any of their Subcontractors, sub-Subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Paragraph 22.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Design/Builder as fiduciary. The Owner or Design/Builder, as appropriate, shall require of the Architect, Architect's consultants, separate Design/Builders, if any, and the Subcontractors, sub-Subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

22.3.5 A loss insured under this property insurance shall be adjusted by the Design/Builder as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Subparagraph 22.3.7. The Design/Builder shall pay Subcontractors their just shares of insurance proceeds received by the Design/Builder, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-Subcontractors in similar manner.

22.3.6 If required in writing by a party in interest, the Design/Builder as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Design/Builder's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Design/Builder shall deposit in a separate account proceeds so received, which the Design/Builder shall distribute in accordance with such agreement as the parties in interest may reach, or in accordance with an arbitrator. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Design/Builder after notification of a Change in the Work.

22.3.7 The Design/Builder as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Design/Builder's exercise of this power; if such objection is made, the dispute shall be resolved by arbitration. The Design/Builder as fiduciary shall, in the case of arbitration, make settlement with insurers in accordance with directions of the arbitrators. If distribution of insurance proceeds by arbitration is required, the arbitrators will direct such distribution.

ARTICLE 23 - SURETY BONDS

23.1 Performance Bond And Payment Bond: The Design/Builder shall furnish separate performance and payment bonds to the Owner. Each bond shall set forth a penal sum in an amount not less than the Contract Price. Each bond furnished by the Design/Builder shall incorporate by reference the terms of the Contract as fully as though they were set forth verbatim in such bonds. In the event the Contract Price is adjusted by Change Order executed by the Design/Builder, the penal sum of both the performance bond and the payment bond shall be deemed increased by like amount. The performance and payment bonds furnished by the Design/Builder shall

be in form suitable to the Owner and shall be executed by a surety, or sureties, reasonably acceptable to the Owner.

ARTICLE 24 - MISCELLANEOUS PROVISIONS

24.1 Governing Law: The Contract shall be governed by the laws of the State of Rhode Island.

24.2 Successors And Assigns: The Owner and the Design/Builder bind themselves, their successors, assigns, executors, administrators and other legal representatives to the other party hereto and to successors, assigns, executors, administrators and other legal representatives of such other party in respect to all terms and conditions of this Contract.

24.3 Non-Assignment: The Design/Builder shall not assign the Contract, or any part of the Contract, without prior written consent of the Owner.

24.4 Notices: Any notice required to be given herein shall be deemed to have been given to the other party if given by first class mail, registered or express mail, courier service, or hand delivery; or by telex or fax, provided that such notice is also confirmed by first class mail, registered or express mail, courier service, or hand delivery to the following addresses:

To Owner:
Town of North Smithfield
Town Hall
One Main Street, Slatersville, Rhode Island 02876

To Design/Builder:

Attn: _____

All notices shall be effective upon receipt.

24.5 Publicity: No information relative to the existence or the details of the Design Services or the Work shall be released by the Design/Builder, either before or after completion of the Project, for publication, advertising or any commercial purposes without the Owner's prior written consent.

24.6 Severability: In the event that any portion or any portions of this Contract are held to be unenforceable by a court of competent jurisdiction, then the remainder of this Contract shall be enforced as though such portions had not been included, unless to do so would cause this Contract to fail of its essential purposes.

Executed by the parties' duly authorized representatives as indicated by their signatures below.

OWNER

DESIGN/BUILDER

_____.Seal
(Typed Name of Owner)

_____.Seal
(Typed Name of Design/Builder)

By:_____
(Signature)

By:_____
(Signature)

(Printed Name, Title & Address)

(Printed Name, Title & Address)

(Date of Execution)

(Date of Execution)

EXHIBIT A

DESIGN SCOPE SPECIFICATION

July 25, 2018

1. Based on the Proposal Documents listed in DOCUMENT 00 00 10 - TABLE OF CONTENTS and DOCUMENT 00 00 15 - LIST OF DRAWINGS, revise the design as required to meet Owner requirements and all requirements of authorities having jurisdiction. Complete the design in accordance with the Proposal Documents, except as approved in writing by the Owner. Obtain Owner approval of any additional details, specifications or criteria that may be necessary to complete the design.
2. Provide any "due diligence" site investigations necessary to support design or permit activities, and not already performed by the Owner and made available to the Design/Builder, including but not limited to geotechnical, traffic, environmental, wetlands and/or utilities surveys. Provide all land survey services necessary for completion of the project beyond the survey information included in the Proposal Documents.
3. Develop the design, with Owner approval, to meet the Total Project Cost stipulated in the Contract Documents. The Total Project Cost includes all design, permitting and construction costs and represents the maximum amount that will be paid to the Design/Builder. Any redesign required to make the project comply with the Total Project Cost is the responsibility of the Design/Builder.
4. Prepare completed Construction Documents and obtain and pay for all permits necessary for implementation of the project. Provide all architectural, engineering, planning and technical services necessary to provide a complete design. Obtain Owner approval of the Construction Documents.
5. The Design/Builder is responsible for providing a facility that is in complete compliance with all applicable codes and requirements of authorities having jurisdiction. The Design/Builder is responsible to have the necessary and appropriate licensed design professionals review the Proposal Documents during the proposal period and make appropriate allowance in their proposal to provide for these codes and requirements. All variance requests must be approved by the Program Manager and will be the responsibility of the Design/Builder.
6. Since time is of the essence, asbestos abatement and demolition can commence as early as possible, prior to completion and approval of the construction documents.
7. Construction shall proceed in an orderly and continuous sequence to the scheduled completion.
8. During Construction, maintain accurate as-built records of the work of all trades. Submit these drawings and specifications monthly for review by the Program Manager.
9. At the completion of Construction, as a condition for Final Payment, submit record drawings and specifications, approved by the Owner. The record drawings shall be submitted in traditional paper format, as well as in electronic format. Electronic format for Drawings shall be Autodesk Revit 2017 (or newer) or AutoCad Version 2017 (or newer) and PDF. Electronic format for Specifications shall be PDF.

END OF DOCUMENT

DOCUMENT 00 61 13

PERFORMANCE BOND; PAYMENT BOND

1. PERFORMANCE BOND

AIA Document A312 - Performance Bond - 2010 Edition is included, following this page, as an integral part of the Bid documents, and issues of this form, signed and executed by the successful Bidder and Surety, will be bound into the executed Contract copies of the Project Manual.

2. PAYMENT BOND

AIA Document A312 - Payment Bond - 2010 Edition is included, following this page, as an integral part of the Bid Documents, and issues of this form, signed and executed by the successful Bidder and Surety, will be bound into the executed Contract copies of the Project Manual

END OF DOCUMENT

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AIA® Document A312™ – 2010

Performance Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

Town of North Smithfield
Town Hall
One Main Street
Slatersville, Rhode Island 02876

CONSTRUCTION CONTRACT

Date:

Amount: \$

Description:

(Name and location)

New Town Hall & Police Headquarters Renovations

BOND

Date:

(Not earlier than Construction Contract Date)

Amount: \$

Modifications to this Bond:

None

See Section 16

CONTRACTOR AS PRINCIPAL

Company: *(Corporate Seal)*

Signature: _____

Name and

Title: _____

(Any additional signatures appear on the last page of this Performance Bond.)

SURETY

Company: _____

Signature: _____

Name and

Title: _____

(Corporate Seal)

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:

(Architect, Engineer or other party:)

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

§ 2 If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except when applicable to participate in a conference as provided in Section 3.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation under this Bond shall arise after

- .1 the Owner first provides notice to the Contractor and the Surety that the Owner is considering declaring a Contractor Default. Such notice shall indicate whether the Owner is requesting a conference among the Owner, Contractor and Surety to discuss the Contractor's performance. If the Owner does not request a conference, the Surety may, within five (5) business days after receipt of the Owner's notice, request such a conference. If the Surety timely requests a conference, the Owner shall attend. Unless the Owner agrees otherwise, any conference requested under this Section 3.1 shall be held within ten (10) business days of the Surety's receipt of the Owner's notice. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default;
- .2 the Owner declares a Contractor Default, terminates the Construction Contract and notifies the Surety; and
- .3 the Owner has agreed to pay the Balance of the Contract Price in accordance with the terms of the Construction Contract to the Surety or to a contractor selected to perform the Construction Contract.

§ 4 Failure on the part of the Owner to comply with the notice requirement in Section 3.1 shall not constitute a failure to comply with a condition precedent to the Surety's obligations, or release the Surety from its obligations, except to the extent the Surety demonstrates actual prejudice.

§ 5 When the Owner has satisfied the conditions of Section 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

§ 5.1 Arrange for the Contractor, with the consent of the Owner, to perform and complete the Construction Contract;

§ 5.2 Undertake to perform and complete the Construction Contract itself, through its agents or independent contractors;

§ 5.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and a contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Section 7 in excess of the Balance of the Contract Price incurred by the Owner as a result of the Contractor Default; or

§ 5.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

- .1 After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, make payment to the Owner; or
- .2 Deny liability in whole or in part and notify the Owner, citing the reasons for denial.

§ 6 If the Surety does not proceed as provided in Section 5 with reasonable promptness, the Surety shall be deemed to be in default on this Bond seven days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Section 5.4, and the Owner refuses the payment or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

§ 7 If the Surety elects to act under Section 5.1, 5.2 or 5.3, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. Subject to the commitment by the Owner to pay the Balance of the Contract Price, the Surety is obligated, without duplication, for

- .1 the responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
- .2 additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Section 5; and
- .3 liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

§ 8 If the Surety elects to act under Section 5.1, 5.3 or 5.4, the Surety's liability is limited to the amount of this Bond.

§ 9 The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, successors and assigns.

§ 10 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 11 Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after a declaration of Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 12 Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears.

§ 13 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 14 Definitions

§ 14.1 Balance of the Contract Price. The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

§ 14.2 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and changes made to the agreement and the Contract Documents.

§ 14.3 Contractor Default. Failure of the Contractor, which has not been remedied or waived, to perform or otherwise to comply with a material term of the Construction Contract.

§ 14.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 14.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 15 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 16 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL

Company: _____
Signature: _____

Name and Title: _____
Address: _____

SURETY

Company: _____
Signature: _____

Name and Title: _____
Address: _____

AIA® Document A312™ – 2010

Payment Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

Town of North Smithfield
Town Hall
One Main Street
Slatersville, Rhode Island 02876

CONSTRUCTION CONTRACT

Date:

Amount: \$

Description:

(Name and location)

New Town Hall & Police Headquarters Renovations

BOND

Date:

(Not earlier than Construction Contract Date)

Amount: \$

Modifications to this Bond:

None

See Section 18

CONTRACTOR AS PRINCIPAL

Company: (Corporate Seal)

Signature:

SURETY

Company:

(Corporate Seal)

Signature:

Name and

Title:

Name and

Title:

(Any additional signatures appear on the last page of this Payment Bond.)

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:

(Architect, Engineer or other party:)

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

§ 1 The Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference, subject to the following terms.

§ 2 If the Contractor promptly makes payment of all sums due to Claimants, and defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, then the Surety and the Contractor shall have no obligation under this Bond.

§ 3 If there is no Owner Default under the Construction Contract, the Surety's obligation to the Owner under this Bond shall arise after the Owner has promptly notified the Contractor and the Surety (at the address described in Section 13) of claims, demands, liens or suits against the Owner or the Owner's property by any person or entity seeking payment for labor, materials or equipment furnished for use in the performance of the Construction Contract and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety.

§ 4 When the Owner has satisfied the conditions in Section 3, the Surety shall promptly and at the Surety's expense defend, indemnify and hold harmless the Owner against a duly tendered claim, demand, lien or suit.

§ 5 The Surety's obligations to a Claimant under this Bond shall arise after the following:

§ 5.1 Claimants, who do not have a direct contract with the Contractor,

- .1 have furnished a written notice of non-payment to the Contractor, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were, or equipment was, furnished or supplied or for whom the labor was done or performed, within ninety (90) days after having last performed labor or last furnished materials or equipment included in the Claim; and
- .2 have sent a Claim to the Surety (at the address described in Section 13).

§ 5.2 Claimants, who are employed by or have a direct contract with the Contractor, have sent a Claim to the Surety (at the address described in Section 13).

§ 6 If a notice of non-payment required by Section 5.1.1 is given by the Owner to the Contractor, that is sufficient to satisfy a Claimant's obligation to furnish a written notice of non-payment under Section 5.1.1.

§ 7 When a Claimant has satisfied the conditions of Sections 5.1 or 5.2, whichever is applicable, the Surety shall promptly and at the Surety's expense take the following actions:

§ 7.1 Send an answer to the Claimant, with a copy to the Owner, within sixty (60) days after receipt of the Claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed; and

§ 7.2 Pay or arrange for payment of any undisputed amounts.

§ 7.3 The Surety's failure to discharge its obligations under Section 7.1 or Section 7.2 shall not be deemed to constitute a waiver of defenses the Surety or Contractor may have or acquire as to a Claim, except as to undisputed amounts for which the Surety and Claimant have reached agreement. If, however, the Surety fails to discharge its obligations under Section 7.1 or Section 7.2, the Surety shall indemnify the Claimant for the reasonable attorney's fees the Claimant incurs thereafter to recover any sums found to be due and owing to the Claimant.

§ 8 The Surety's total obligation shall not exceed the amount of this Bond, plus the amount of reasonable attorney's fees provided under Section 7.3, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

§ 9 Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any construction performance bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

§ 10 The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for the payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligation to make payments to, or give notice on behalf of, Claimants or otherwise have any obligations to Claimants under this Bond.

§ 11 The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

§ 12 No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the state in which the project that is the subject of the Construction Contract is located or after the expiration of one year from the date (1) on which the Claimant sent a Claim to the Surety pursuant to Section 5.1.2 or 5.2, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

§ 13 Notice and Claims to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the page on which their signature appears. Actual receipt of notice or Claims, however accomplished, shall be sufficient compliance as of the date received.

§ 14 When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. When so furnished, the intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

§ 15 Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor and Owner shall promptly furnish a copy of this Bond or shall permit a copy to be made.

§ 16 Definitions

§ 16.1 Claim. A written statement by the Claimant including at a minimum:

- .1 the name of the Claimant;
- .2 the name of the person for whom the labor was done, or materials or equipment furnished;
- .3 a copy of the agreement or purchase order pursuant to which labor, materials or equipment was furnished for use in the performance of the Construction Contract;
- .4 a brief description of the labor, materials or equipment furnished;
- .5 the date on which the Claimant last performed labor or last furnished materials or equipment for use in the performance of the Construction Contract;
- .6 the total amount earned by the Claimant for labor, materials or equipment furnished as of the date of the Claim;
- .7 the total amount of previous payments received by the Claimant; and
- .8 the total amount due and unpaid to the Claimant for labor, materials or equipment furnished as of the date of the Claim.

§ 16.2 Claimant. An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Construction Contract. The term Claimant also includes any individual or entity that has rightfully asserted a claim under an applicable mechanic's lien or similar statute against the real property upon which the Project is located. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

§ 16.3 Construction Contract. The agreement between the Owner and Contractor identified on the cover page, including all Contract Documents and all changes made to the agreement and the Contract Documents.

§ 16.4 Owner Default. Failure of the Owner, which has not been remedied or waived, to pay the Contractor as required under the Construction Contract or to perform and complete or comply with the other material terms of the Construction Contract.

§ 16.5 Contract Documents. All the documents that comprise the agreement between the Owner and Contractor.

§ 17 If this Bond is issued for an agreement between a Contractor and subcontractor, the term Contractor in this Bond shall be deemed to be Subcontractor and the term Owner shall be deemed to be Contractor.

§ 18 Modifications to this bond are as follows:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL

Company: _____
Signature: _____
(Corporate Seal)

SURETY

Company: _____
Signature: _____
(Corporate Seal)

Name and Title: _____
Address: _____

Name and Title: _____
Address: _____

DOCUMENT 00 73 46

PREVAILING WAGE RATES

The State of Rhode Island Department of Labor, Division of Professional Regulation General Decision Modification document, current as of the bid issuance date for this Project, is an integral part of the Bid Documents for use in fulfilling prevailing wage rate requirements.

The Contractor is responsible to obtain a copy of the table from the Rhode Island Department of Administration, Division of Purchases web site. Additional information concerning prevailing wage rates may be obtained from the Division of Professional Regulation, Department of Labor and Training, 1511 Pontiac Avenue, Cranston, Rhode Island, 02920.

To view wage rate table, enter the Rhode Island Department of Labor and Training web site www.dlt.ri.gov

Click on "Workplace Regulations".

Click on the Link: "Davis Bacon Wage Rates"

Select the correct DBA wage decision.

This project is in Providence County and the Construction Type is Building.

END OF DOCUMENT

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SECTION 01 10 00

SUMMARY OF WORK

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Contract description.
- B. Work by Owner.
- C. Owner supplied products.
- D. Design/Builder's use of site and premises.
- E. Owner occupancy.
- F. Work sequence.
- G. Hazardous Material Suspicion

1.02 CONTRACT DESCRIPTION

- A. Work of the Project includes the renovations to existing buildings as described on the drawings and in this project manual.
- B. Perform the Work of the Contract under a stipulated sum Contract with the Owner in accordance with the Conditions of Contract.
- C. The Work of the Contract is identified in the Project Manual and on the Drawings.

1.03 WORK BY OWNER

- A. Items noted NIC (Not in Contract) will be furnished and installed by the Owner after substantial completion.

1.04 OWNER SUPPLIED PRODUCTS

- A. Owner's Responsibilities:
 - 1. Arrange for and deliver Owner-reviewed Shop Drawings, Product Data, and Samples, to the Design/Builder.
 - 2. Arrange and pay for delivery to the site.
 - 3. On delivery, inspect products jointly with the Design/Builder.
 - 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 - 5. Arrange for manufacturers' warranties, inspections, and service.

- B. Design/Builder's Responsibilities:
 - 1. Review Owner-reviewed Shop Drawings, Product Data, and Samples.
 - 2. Receive and unload products at the site; inspect for completeness or damage jointly with the Owner.
 - 3. Handle, store, install and finish products.
 - 4. Repair or replace items damaged after receipt.
- C. Items furnished by the Owner for installation by the Design/Builder:
 - 1. Paper towel dispensers, toilet paper dispensers and soap dispensers.

1.05 DESIGN/BUILDER'S USE OF SITE AND PREMISES

- A. Limit use of the site and premises to allow:
 - 1. Police Headquarters: Owner occupancy throughout construction.
 - a. Use of the site and premises by the public.
 - 2. New Town Hall: The Owner will not occupy the site and premises during construction.
- B. Construction Personnel Conduct
 - 1. The following conduct by construction personnel will not be tolerated on the Owner's property, violators may be ejected from the site.
 - a. NO SMOKING is allowed. The Design/Builder will erect signs noting such at all entrances.
 - b. No drugs or alcohol are allowed
 - c. No firearms or weapons are allowed.
 - d. No foul language will be tolerated.
 - e. No fighting. All involved will be subject to being removed from the site.

1.06 OWNER OCCUPANCY

- A. Police Headquarters: The Owner will occupy the site and premises for the conduct of normal operations. The project will be constructed in phases to accommodate the Owner's operations..
- B. New Town Hall: The Owner will not occupy the site and premises during construction.

1.07 WORK SEQUENCE

- A. Construct the Work in phases to accommodate the Owner's occupancy requirements during the construction period, coordinate the construction schedule and operations with the Owner.

1.08 HAZARDOUS MATERIAL SUSPICION

- A. If, during the course of construction, the Design/Builder suspects a material to contain asbestos, all work involving the material is to be stopped and the Owner notified immediately of the suspicion. Until the material is confirmed to be safe or tested and determined to be an asbestos containing material, the Design/Builder is to assume it contains asbestos and is to avoid contact. Upon notification of its composition the Owner will determine the course of action and inform the Design/Builder accordingly.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

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SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Schedule of values.
- B. Applications for payment.
- C. Sales Tax Exemption
- D. Change procedures.
- E. Defect assessment.
- F. Unit prices.

1.02 SCHEDULE OF VALUES

- A. Submit a printed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet
- B. Submit Schedule of Values in duplicate, one copyrighted original and one copy, within fifteen (15) days after date of receipt of a Notice to Proceed.
- C. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the major specification Section. Identify site mobilization, bonds and insurance.
- D. Include in each line item, the amount of Allowances specified in Section 01 21 00 if occurring. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.
- E. Include separately from each line item, a direct proportional amount of Design/Builder's overhead and profit.
- F. Revise schedule to list approved Change Orders, with each Application for Payment.

1.03 APPLICATIONS FOR PAYMENT

- A. Submit each application on an original copyrighted AIA Form G702 - Application and Certificate for Payment and AIA G703 - Continuation Sheet, accompanied by three copies.
 - 1. Individually sign and notarize, and emboss with notary's official seal, the original and each of the three copies.
 - 2. Applications not including original copyrighted AIA G702, and G703 Forms, will be rejected, and returned for resubmittal.
 - 3. Applications not properly signed and notarized will be rejected, and returned for resubmittal.
- B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

- C. Provide one copy of the updated construction schedule with each Application for Payment submission.
 - 1. Provide a statement signed by the Design/Builder's firm principal certifying that there are no unidentified outstanding claims for delay.
- D. Include with each monthly Application for Payment, following the first application, one copy of the Certified Monthly Payroll Record for the previous month's pay period.
- E. Payment Period: Submit at intervals stipulated in the Agreement.
- F. Submit with transmittal letter as specified for Submittals in Section 01 33 00.
- G. Substantiating Data: When the Owner requires substantiating information, submit data justifying dollar amounts in question. Include the following with the Application for Payment :
 - 1. Record Documents as specified in Section 01 78 00, for review by the Owner which will be returned to the Design/Builder.
 - 2. Affidavits attesting to off-site stored products.
 - 3. Construction progress schedules, revised and current as specified in Section 01 33 00.

1.04 SALES TAX EXEMPTION

- A. Owner is exempt from sales tax on products permanently incorporated in Work of the Project.
 - 1. Obtain sales tax exemption certificate number from Owner.
 - 2. Place exemption certificate number on invoice for materials incorporated in the Work of the Project.
 - 3. Furnish copies of invoices to Owner.
 - 4. Upon completion of Work, file a notarized statement with Owner that all purchases made under exemption certificate were entitled to be exempt.
 - 5. Pay legally assessed penalties for improper use of exemption certificate number.

1.05 CHANGE PROCEDURES

- A. Submittals: Submit name of the individual authorized to receive change documents, and be responsible for informing others in Design/Builder's employ or Subcontractors of changes to the Work.
- B. The Owner will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time by issuing supplemental instructions on AIA Form G710
- C. The Owner may issue a Proposal Request which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Design/Builder will prepare and submit an estimate within fifteen (15) days.
- D. The Design/Builder may propose changes by submitting a request for change to the Owner, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation, and a statement describing the effect on Work by separate or other Contractors. Document any requested substitutions in accordance with Section 01 60 00.

- E. Stipulated Sum Change Order: Based on Proposal Request, and Design/Builder's fixed price quotation, or Design/Builder's request for a Change Order as approved by Owner.
- F. Unit Price Change Order: For contract unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of work that are not pre-determined, execute the Work under a Construction Change Directive. Changes in the Contract Sum or Contract Time will be computed as specified for a Time and Material Change Order.
- G. Construction Change Directive: Owner may issue a directive, on AIA Form G713 Construction Change Directive signed by the Owner, instructing the Design/Builder to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in the Contract Sum or Contract Time. Promptly execute the change.
- H. Time and Material Change Order: Submit an itemized account and supporting data after completion of the change, within the time limits indicated in the Conditions of the Contract. The Owner will determine the change allowable in the Contract Sum and Contract Time as provided in the Contract Documents.
- I. Maintain detailed records of work done on a Time and Material basis. Provide full information required for an evaluation of the proposed changes, and to substantiate costs for the changes in the Work.
- J. Document each quotation for a change in cost or time with sufficient data to allow an evaluation of the quotation. Provide detailed breakdown of costs and estimates for labor and materials including a detailed breakdown for subcontractor's or vendor's Work. Include copies of written quotations from subcontractors or vendors.
- K. Change Order Forms: AIA G701 Change Order.
- L. Execution of Change Orders: The Owner will issue Change Orders for signatures of the parties as provided in the Conditions of the Contract.
- M. Correlation Of Design/Builder Submittals:
 - 1. Promptly revise the Schedule of Values and the Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
 - 2. Promptly revise progress schedules to reflect any change in the Contract Time, revise sub-schedules to adjust times for any other items of work affected by the change, and resubmit.
 - 3. Promptly enter changes in the Project Record Documents.

1.06 DEFECT ASSESSMENT

- A. Replace the Work, or portions of the Work, not conforming to specified requirements.
- B. If, in the opinion of the Owner, it is not practical to remove and replace the Work, the Owner will direct an appropriate remedy or adjust payment.
- C. The defective Work may remain, but the unit sum will be adjusted to a new sum at the discretion of the Owner.
- D. The defective Work will be partially repaired to the instructions of the Owner, and the unit sum will be adjusted to a new sum at the discretion of the Owner.

- E. The individual Specification Sections may modify these options or may identify a specific formula or percentage sum reduction.
- F. The authority of the Owner to assess the defect and identify a payment adjustment is final.
- G. Non-Payment for Rejected Products: Payment will not be made for rejected products for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined as unacceptable before or after placement.
 - 3. Products not completely unloaded from the transporting vehicle.
 - 4. Products placed beyond the lines and levels of the required Work.
 - 5. Products remaining on hand after completion of the Work.
 - 6. Loading, hauling, and disposing of rejected products.

1.07 UNIT PRICES

- A. Authority: Measurement methods are delineated in the individual specification Sections.
- B. Measurement methods delineated in the individual specification Sections complement the criteria of this section. In case of conflict, the requirements of the individual specification Section govern.
- C. Take measurements and compute quantities. The Owner will verify measurements and quantities.
- D. Unit Quantities: The quantities and measurements indicated in the Bid Form are for contract purposes only. The quantities and measurements supplied or placed in the Work shall determine payment.
 - 1. When the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit sum contracted.
 - 2. When the actual Work requires a 25 percent or greater change in quantity than those quantities indicated, the Owner or Design/Builder may claim for a Contract Price adjustment.
- E. Unit Price amount includes: Full compensation for required labor, products, tools, equipment, plant and facilities, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.
- F. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Owner multiplied by the unit sum for Work which is incorporated in or made necessary by the Work.
- G. Measurement of Quantities:
 - 1. Weigh Scales: Inspected, tested and certified by the applicable state Weights and Measures department within the past year.
 - 2. Platform Scales: Of sufficient size and capacity to accommodate the conveying vehicle.
 - 3. Metering Devices: Inspected, tested and certified by the applicable State department within the past year.
 - 4. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.
 - 5. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.
 - 6. Measurement by Area: Measured by square dimension using mean length and width or radius.

7. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.
8. Stipulated Sum Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.

H. See Bid Form for schedule of Unit Prices.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

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SECTION 01 21 00

ALLOWANCES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Cash allowances.

1.02 CASH ALLOWANCES

- A. Costs Included in Cash Allowances: Cost of product to Design/Builder or Subcontractor, labor for installation and finishing, less applicable trade discounts; delivery to site, and applicable taxes
- B. Costs Not Included in Cash Allowances But Included in the Contract Sum: Product delivery to site and handling at the site, including unloading, uncrating, and storage; protection of products from elements and from damage.
- C. Owner Responsibilities:
1. Consult with Design/Builder for consideration and selection of products, suppliers, and installers.
 2. Review and approval of shop drawings, product data and samples.
- D. Design/Builder Responsibilities:
1. Assist Owner in selection of products, suppliers and installers.
 2. Obtain proposals from suppliers and installers and offer recommendations.
 3. On notification of selection by Owner, execute purchase agreement with designated supplier and installer.
 4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
 5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.
- E. Differences in costs will be adjusted by Change Order.
- F. Allowances Schedule:
1. **Interior & Exterior Building Signage (Base Bid "A"):**
Include the sum of **five thousand dollars (\$ 5,000.00)** for all work associated with the purchase and installation of signage.
 2. **Interior & Exterior Building Signage (Base Bid "B"):**
Include the sum of **five thousand dollars (\$ 5,000.00)** for all work associated with the purchase and installation of signage.

3. **Roof Repairs (Base Bid "B"):**

Include the sum of **seventy five thousand dollars (\$ 75,000.00)** for all work associated with repairs to the roof at Police Headquarters including any necessary asbestos containing material abatement.

1.03 TESTING AND INSPECTION ALLOWANCES

- A. Costs included in Testing and Inspecting Allowances: Cost of engaging a testing and inspecting agency; execution of tests and inspecting; and reporting results.
- B. Costs not included in the Testing and Inspecting Allowance but included in the Contract Sum:
 - 1. Costs of incidental labor and facilities required to assist testing or inspecting agency.
 - 2. Costs of testing services used by Contractor separate from Contract Document requirements.
 - 3. Costs of retesting upon failure of previous tests as determined by Architect.
- C. Payment Procedures:
 - 1. Submit one copy of the inspecting or testing firm's invoice with each copy of the next application for payment.
 - 2. Pay invoice on approval by Architect.
- D. Testing and Inspecting Allowances Schedule:
 - 1. Include the sum of **thirty thousand dollars (\$ 30,000.00)** for payment of testing, or inspecting, laboratory services for compacted soils and concrete as required by the pertinent specification sections including RI State Mandated Special Inspections.
- E. Differences in cost will be adjusted by Change Order.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01 22 00

ALTERNATES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Alternates.

1.02 ALTERNATES

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in Owner – Design/Builder Agreement.
- B. Coordinate related work and modify surrounding work as required.
- C. Schedule of Alternates:
1. **Alternate No. 1: Alternate Start Date for Base Bid “B”:**
This Alternate contemplates the addition to, or deduction from, Base Bid “B” all work, general conditions, etc. associated with postponing the start of construction date for Base Bid “B”, North Smithfield Police Headquarters Renovations, to one hundred eighty (180) calendar days following the receipt of the Notice to Proceed.
 2. **Alternate No. 2: New Asphalt Paving & Striping at New Town Hall:**
This Alternate contemplates the addition to Base Bid “A” all work associated with the preparation and installation of a new asphalt parking lot as shown on the drawings.
 3. **Alternate No. 3: New Finishes in the Police Workout Area at the Police Headquarters:**
This Alternate contemplates the addition to Base Bid “B” all work associated with the installation of new finishes as shown on the drawings.
 4. **Alternate No. 4: New Finishes & Partition on the First Floor at the Police Headquarters:**
This Alternate contemplates the addition to Base Bid “B” all work associated with the installation of new finishes and a new partition as shown on the drawings.
 5. **Alternate No. 5: Repair of Existing Plaster Ceilings at the Police Headquarters:**
This Alternate contemplates the addition to Base Bid “B” all work associated with the patching and repair of damaged areas of the existing asbestos containing plaster ceilings. For Bid purposes the area is one thousand (1,000) square feet. All

adjustments of this number are to be made using the associated Unit Price from the Proposal Form.

6. **Alternate No. 6: Replace Roof at New Town Hall:**

This Alternate contemplates the addition to Base Bid "A" all work associated with the removal of the existing roofing system down to the roof deck where noted on the drawings and the subsequent installation of a new single ply EPDM roofing system including new insulation and metal edge. New system to meet all state building code requirements.

7. **Alternate No.7: Patch Plaster Ceilings at the Police Headquarters**

This Alternate contemplates the addition to Base Bid "B" all work associated with patching the existing asbestos containing plaster ceilings. This work includes the careful, temporary removal of the existing acoustical ceiling panels and grid to allow access to repair the plaster ceiling above. The asbestos containing plaster will not be removed, just patched to match existing. For bidding purposes, assume one thousand square feet (1,000 sq. ft.) of patch work. See the unit price for a square foot patching cost for addition to or subtraction from this Base Bid amount.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01 31 00

ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Coordination and project conditions.
- B. Preconstruction meeting.
- C. Site mobilization meeting.
- D. Progress meetings.
- E. Preinstallation meetings.

1.02 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate the scheduling, submittals, and the Work of the various Sections of the Project Manual to ensure an efficient and orderly sequence of the installation of interdependent construction elements with provisions for accommodating the items installed later.
- B. Verify that the utility requirements and characteristics of the operating equipment are compatible with the building utilities. Coordinate the Work of the various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate the space requirements, supports, and installation of the mechanical, plumbing and electrical Work, which are indicated diagrammatically on the Drawings. Follow the routing shown for the pipes, ducts, and conduit, as closely as practicable; place runs parallel with the lines of the building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
 - 1. The Design/Builder is to provide coordination drawings indicating size and locations of all mechanical, plumbing, fire protection and electrical work to confirm conflicts do not exist between systems. Submit four hard copies to the Owner for review prior to purchasing and fabrication of materials.
- D. In finished areas except as otherwise indicated, conceal the pipes, ducts, and wiring within the construction. Coordinate the locations of fixtures and outlets with the finish elements.
- E. Coordinate the completion and clean up of the Work of the separate Sections in preparation for Substantial Completion.
- F. After the Owner's occupancy of the premises, coordinate access to the site for correction of the defective Work and the Work not in accordance with the Contract Documents, to minimize disruption of the Owner's activities.

1.03 PRECONSTRUCTION MEETING

- A. The Owner will schedule a meeting after a Notice to Proceed is issued to the Design/Builder.
- B. Attendance Required: Owner and Design/Builder.
- C. Agenda:
 - 1. Execution of the Owner-Design/Builder Agreement.
 - 2. Submission of the executed bonds and insurance certificates.
 - 3. Distribution of the Contract Documents.
 - 4. Submission of a list of Subcontractors, a list of products, schedule of values, and a progress schedule.
 - 5. Designation of the personnel representing the parties in the Contract, and the Owner.
 - 6. The procedures and processing of the field decisions, submittals, substitutions, applications for payments, proposal requests, Change Orders, and Contract closeout procedures.
 - 7. Scheduling.
- D. Record the minutes and distribute copies within two days after the meeting to the participants, with two copies to the Owner, the participants, and those affected by the decisions made.

1.04 SITE MOBILIZATION MEETING

- A. The Owner will schedule a meeting at the Project site prior to the Design/Builder's occupancy.
- B. Attendance Required: The Owner, Special Consultants, and, Design/Builder, the Design/Builder's Superintendent, and major Subcontractors.
- C. Agenda:
 - 1. Use of the premises by the Owner and the Design/Builder.
 - 2. The Owner's requirements and occupancy.
 - 3. Construction facilities and controls provided by the Owner.
 - 4. Temporary utilities provided by the Owner.
 - 5. Survey and building layout.
 - 6. Security and housekeeping procedures.
 - 7. Schedules.
 - 8. Application for payment procedures.
 - 9. Procedures for testing.
 - 10. Procedures for maintaining the record documents.
 - 11. Requirements for start-up of the equipment.
 - 12. Inspection and acceptance of the equipment put into service during the construction period.
- D. Record the minutes and distribute the copies within two days after the meeting to the participants, with two copies to the Owner, participants, and those affected by the decisions made.

1.05 PROGRESS MEETINGS

- A. Schedule and administer the meetings throughout the progress of the Work at maximum bi-weekly (14 day) intervals.
- B. Make arrangements for the meetings, prepare the agenda with copies for the participants, and preside at the meetings.
- C. Attendance Required: The job superintendent, major subcontractors and suppliers, and the Owner, as appropriate to agenda topics for each meeting.
- D. Agenda:
 - 1. Review the minutes of previous meetings.
 - 2. Review of the Work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of the problems which impede the planned progress.
 - 5. Review of the submittals schedule and status of the submittals.
 - 6. Review of the off-site fabrication and delivery schedules.
 - 7. Maintenance of the progress schedule.
 - 8. Corrective measures to regain the projected schedules.
 - 9. Planned progress during the succeeding work period.
 - 10. Coordination of the projected progress.
 - 11. Maintenance of the quality and work standards.
 - 12. Effect of the proposed changes on the progress schedule and coordination.
 - 13. Other business relating to the Work.
- E. Record the minutes and distribute the copies within two days after the meeting to the participants, with two copies to the Owner, participants, and those affected by the decisions made.

1.06 PREINSTALLATION MEETING

- A. When required in the individual specification Sections, convene a preinstallation meeting at the site prior to commencing the Work of the Section.
- B. Require attendance of the parties directly affecting, or affected by, the Work of the specific Section.
- C. Notify the Owner four days in advance of the meeting date.
- D. Prepare an agenda and preside at the meeting:
 - 1. Review the conditions of installation, preparation and installation procedures.
 - 2. Review coordination with the related work.
- E. Record the minutes and distribute the copies within two days after the meeting to the participants, with two copies to the Owner, participants, and those affected by the decisions made.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

The following procedures will be used for submittals based on the approved Project Manual submitted by the Design/Builder.

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Submittal procedures.
- B. Construction progress schedules.
- C. Proposed products list.
- D. Method for Submission of Shop Drawings and Product Data
- E. Product data.
- F. Shop drawings.
- G. Samples.
- H. Design data.
- I. Test reports.
- J. Certificates.
- K. Manufacturer's instructions.
- L. Manufacturer's field reports.
- M. Erection drawings.
- N. Construction photographs.

1.02 SUBMITTAL PROCEDURES

- A. Master List Submittal:
 - 1. Submit a master list of the required submittals with a proposed date for each item to be submitted.
 - 2. Show the date submittal was sent, days since submittal was sent, status of submittal, date submittal was received in return, and any date associated with resubmittals.
 - 3. Up date master list with each submission and response.

4. Issue copy of master list at least monthly to the Owner.
- B. Transmit each submittal with a dated Owner-accepted transmittal form.
- C. Sequentially number the transmittal form. Mark revised submittals with the original number and a sequential alphabetic suffix.
- D. Identify the Project, Design/Builder, subcontractor and supplier; the pertinent drawing and detail number, and the specification Section number, appropriate to the submittal.
- E. Apply a Design/Builder's stamp, and an Architect's stamp signed or initialed, certifying that the review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of the information is in accordance with the requirements of the Work and the Contract Documents.
- F. Schedule submittals to expedite the Project, and deliver to the Owner at their business address. Coordinate the submission of related items. Upon completion of the submittal's review, the Owner's office will notify the Design/Builder. The Design/Builder is then responsible to pick-up the submittals in a timely manner.
- G. For each submittal for review, allow fifteen (15) days excluding the delivery time to and from the Design/Builder.
- H. Identify the variations from the Contract Documents and the Product or system limitations that may be detrimental to a successful performance of the completed Work.
- I. Allow space on the submittals for the Design/Builder's and the Owner's review stamps.
- J. When revised for resubmission, identify the changes made since the previous submission.
- K. Distribute copies of the reviewed submittals as appropriate. Instruct the parties to promptly report an inability to comply with the Contract requirements.
- L. Submittals not requested will not be recognized or processed.
- M. The Design/Builder will compensate the Owner and all consulting Engineers for services performed reviewing submittals beyond the original review and two follow-up reviews of the same product, material, sample or assembly. The compensation will be made through a credit change order that will reduce the total contract amount.

1.03 CONSTRUCTION PROGRESS SCHEDULES

- A. Submit preliminary outline Schedules within fifteen (15) days after the date of receipt of a Notice to Proceed for coordination with the Owner's requirements. After a review, submit detailed schedules within fifteen (15) days modified to accommodate the revisions recommended by the Owner.
- B. Submit revised Progress Schedules with each Application for Payment.

- C. Distribute copies of the reviewed schedules to the Project site file, subcontractors, suppliers, and other concerned parties.
- D. Instruct the recipients to promptly report, in writing, the problems anticipated by the projections indicated in the schedules.
- E. Submit a computer generated horizontal bar chart with a separate line for each major portion of the Work or operation, or section of the Work, identifying the first workday of each week.
- F. Show a complete sequence of construction by activity, identifying the Work of separate stages and other logically grouped activities. Indicate the early and late start, the early and late finish, float dates, and the duration.
- G. Indicate an estimated percentage of completion for each item of the Work at each submission.
- H. Provide a separate schedule of submittal dates for shop drawings, product data, and samples, including Owner furnished Products and Products identified under Allowances, if any, and the dates reviewed submittals will be required from the Owner. Indicate the decision dates for selection of the finishes.
- I. Indicate the delivery dates for Owner furnished Products, and for Products identified under Allowances.
- J. Revisions to Schedules:
 - 1. Indicate the progress of each activity to the date of submittal, and the projected completion date of each activity.
 - 2. Identify the activities modified since the previous submittal, major changes in the scope, and other identifiable changes.
 - 3. Provide a narrative report to define the problem areas, the anticipated delays, and impact on the Schedule. Report the corrective action taken, or proposed, and its effect including the effect of changes on the schedules of separate contractors.

1.04 PROPOSED PRODUCTS LIST

- A. Within fifteen (15) days after the date of receipt of a Notice to Proceed, submit a list of major products proposed for use, with the name of the manufacturer, the trade name, and the model number of each product.
- B. For the products specified only by reference standards, give the manufacturer, trade name, model or catalog designation, and reference standards.
- C. With each product listed, indicate the submittal requirements specified to be adhered to, and an indication of relevant "long-lead-time" information, when appropriate.

1.05 METHOD FOR SUBMISSION OF SHOP DRAWING AND PRODUCT DATA

- A. Method of electronic or hard copy delivery of shop drawing and data submittals is to be discussed with Owner at Preconstruction meeting.
Use one of the three methods listed below:
1. Use an internet-based system agreed upon by the Owner and Design/Builder.
Comply with required transmittal and data formats using numbering system approved by Owner.
Assemble submittal package into a single indexed file incorporating submittal and cover sheet explaining project name, number, Owner, Design/Builder and submittal number.
 2. Email an electronic format (PDF) copy to the Owner.
Comply with required transmittal and data formats using numbering system approved by Owner.
Assemble submittal package into a single indexed file incorporating submittal and cover sheet explaining project name, number, Owner, Design/Builder and submittal number.
 3. Hard copies delivered to the Owner are to be submitted with the number of copies that the Design/Builder requires, plus three copies the Owner will retain.
- B. All shop drawings 24" x 36" or larger are to be delivered to the Owner in hard copy format as noted in Method 3 above.
- C. All submittals are to include a Design/Builder's review stamp confirming approval prior to submission to the Owner.
- D. The Owner will return the reviewed submittal to the Design/Builder for distribution to subcontractors, suppliers, fabricators, and others as necessary for proper performance of the Work.
- E. Submit color samples on actual product material for final color selection by sending them via postal or delivery service directly to the Owner's office.

1.06 PRODUCT DATA

- A. Product Data: Submit to the Owner for review for the limited purpose of checking for conformance with the information given and the design concept expressed in the Contract Documents. Provide copies and distribute in accordance with the SUBMITTAL PROCEDURES article and for the record documents purposes described in Section 01 78 00.
- D. Mark each copy to identify the applicable products, models, options, and other data. Supplement the manufacturers' standard data to provide the information specific to this Project.
- E. Indicate the product utility and electrical characteristics, the utility connection requirements, and the location of utility outlets for service for functional equipment and appliances.
- F. After receiving approved submittals, distribute in accordance with the Submittal Procedures article above and provide copies for record documents described in Section 01 78 00.

1.07 SHOP DRAWINGS

- A. Shop Drawings: Submit to the Owner for review for the limited purpose of checking for conformance with the information given and the design concept expressed in the Contract

Documents. Produce copies and distribute in accordance with the SUBMITTAL PROCEDURES article and for the record documents purposes described in Section 01 78 00.

- B. Indicate the special utility and electrical characteristics, the utility connection requirements, and the location of utility outlets for service for functional equipment and appliances.
- C. Submit the number of copies that the Design/Builder requires, plus three copies the Owner will retain.

1.08 SAMPLES

- A. Samples: Submit to the Owner for review for the limited purpose of checking for conformance with the information given and the design concept expressed in the Contract Documents. Produce duplicates and distribute in accordance with the SUBMITTAL PROCEDURES article and for the record documents purposes described in Section 01 78 00.
- B. Samples For Selection as Specified in Product Sections:
 - 1. Submit to the Owner for aesthetic, color, or finish selection.
 - 2. Submit samples of the finishes, indicating colors, texture, and patterns for the Owner's selection.
 - 3. After review, produce duplicates and distribute in accordance with the SUBMITTAL PROCEDURES article and for the record documents purposes described in Section 01 78 00.
- C. Submit samples to illustrate the functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate the sample submittals for interfacing Work.
- D. Include identification on each sample, with the full Project information.
- E. Submit the number of samples specified in the individual specification Sections; the Owner will retain one sample.
- F. Reviewed samples, which may be used in the Work, are indicated in the individual specification Sections.
- G. Samples will not be used for testing purposes unless they are specifically stated to be in the specification Section.

1.09 DESIGN DATA

- A. Submit for the Owner's knowledge as contract administrator.
- B. Submit for information for the limited purpose of assessing conformance with the information given and the design concept expressed in the Contract Documents.

1.10 TEST REPORTS

- A. Submit for the Owner's knowledge as contract administrator.

- B. Submit test reports for information for the limited purpose of assessing conformance with the information given and the design concept expressed in the Contract Documents.

1.11 CERTIFICATES

- A. When specified in the individual specification Sections, submit certification by the manufacturer, installation/application subcontractor, or the Design/Builder to the Owner, in the quantities specified for the Product Data.
- B. Indicate that the material or product conforms to or exceeds the specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on the material or product, but must be acceptable to the Owner.

1.12 MANUFACTURER'S INSTRUCTIONS

- A. When specified in the individual specification Sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to the Owner for delivery in the quantities specified for Product Data.
- B. Indicate the special procedures, and the perimeter conditions requiring special attention, and the special environmental criteria required for application or installation.

1.13 MANUFACTURER'S FIELD REPORTS

- A. Submit reports for the Owner's benefit as contract administrator.
- B. Submit the report in duplicate within thirty (30) days of observation to the Owner for information.
- C. Submit for information for the limited purpose of assessing conformance with the information given and the design concept expressed in the Contract Documents.

1.14 ERECTION DRAWINGS

- A. Submit drawings for the Owner's benefit as contract administrator.
- B. Submit for information for the limited purpose of assessing conformance with the information given and the design concept expressed in the Contract Documents.
- C. Data indicating inappropriate or unacceptable Work may be subject to action by the Owner.

1.15 CONSTRUCTION PHOTOGRAPHS

- A. Take digital photographs of the site and construction throughout the progress of the Work produced by an experienced photographer.
- B. Provide minimum ten (10) – photographs per week. All photographs are to have the date imprinted on the face of the photograph.

- C. Take photographs from differing directions, as appropriate, and as may be requested by the Owner, indicating the relative progress of the Work.
- D. Submit all digital photographs on a compact disc in J-PEG or PDF format at the end of the project as part of the closeout documents. Submit photographs during construction if requested by the Owner.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

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SECTION 01 43 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Quality control and control of installation.
- B. Verification of Credentials and Licenses.
- C. Safety Awareness Policy
- D. Tolerances
- E. References.
- F. Mock-up requirements.
- G. Testing and inspection services.
- H. State Mandated Structural Special Inspections
- I. Manufacturers' field services.

1.02 QUALITY CONTROL AND CONTROL OF INSTALLATION

- A. Monitor a quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of the specified quality.
- B. Comply with the manufacturers' instructions, including each step in sequence.
- C. When the manufacturers' instructions conflict with the Contract Documents, request a clarification from the Owner before proceeding.
- D. Comply with the specified standards as a minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform the Work by persons qualified to produce the required and specified quality.
- F. Verify that field measurements are as indicated on the Shop Drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

- H. Field measurements
 - 1. Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication scheduled with construction progress to avoid construction delays.
- I. Concrete Installation Quality Control
 - 1. **NO** concrete is to be installed without prior inspection by the Owner of all forms, reinforcement and vapor barriers and receipt of a written approval by the Owner.
 - 2. The Owner is to be notified a minimum of three (3) working days prior to each pour.
 - 3. All inconsistencies will be corrected, re-inspected and approved by the Owner prior to installation of the concrete.

1.03 VERIFICATION OF CREDENTIALS AND LICENSES

- A. All persons employed on the project site must have appropriate and current credentials and licenses in their possession, at the project site, for the work they are performing.
- B. Be forewarned that inspectors will be checking for verification of credentials and licenses of both union and non-union persons, in their onsite inspections.
- C. Inspectors will also be reviewing Design/Builder's Certified Monthly Payroll Records for conformance with RI State Prevailing Wage Rate requirements.
- D. Those persons without the appropriate credentials and licenses will be subject to dismissal from the project site.

1.04 SAFETY AWARENESS POLICY

- A. In accordance with Rhode Island General Laws, Title 28, S28-20-35 5.1 Safety awareness program required. (Effective January 1, 2002.) all Design/Builders who bid on municipal and state construction projects with a total project cost of One Hundred Thousand Dollars(\$100,000.00) or more, shall have an OSHA "ten hour safety construction program" for their on-site employees. The training shall utilize instructors trained by the Occupational Safety Health Administration, using OSHA approved curriculum. Graduates shall receive a card from the U. S. Department of Labor Occupational Safety and Health Administration certifying the successful completion of the training course. The director of the Rhode Island Department of Labor and Training shall promulgate rules, regulations and penalties to enforce provisions of this section.
- B. The Design/Builder is required to conform to all applicable OSHA requirements on this project.

1.05 TOLERANCES

- A. Monitor the fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with the manufacturers' tolerances. When the manufacturers' tolerances conflict with the Contract Documents, request a clarification from the Owner before proceeding.

- C. Adjust products to appropriate dimensions; position before securing products in place.

1.06 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by the date of issue current on the date of the Contract Documents, except where a specific date is established by code.
- C. Obtain copies of the standards where required by the product specification Sections.
- D. When the specified reference standards conflict with the Contract Documents, request a clarification from the Owner before proceeding.
- E. Neither the contractual relationships, duties, nor responsibilities of the parties in the Contract, nor those of the Owner, shall be altered from the Contract Documents by mention or inference otherwise in reference documents.

1.07 MOCK-UP REQUIREMENTS

- A. Tests will be performed under the provisions identified in this Section and identified in the respective product specification Sections.
- B. Assemble and erect the specified items with the specified attachment and anchorage devices, flashing, seals, and finishes.
- C. Accepted mock-ups shall be a comparison standard for the remaining Work.
- D. Where the mock-up has been accepted by the Owner and is specified in the product specification Sections to be removed, remove the mock-up and clear the area when directed to do so by the Owner.

1.08 TESTING AND INSPECTION SERVICES

- A. The Design/Builder will submit the name of an independent firm to the Owner for approval by the Owner, to perform the testing and inspection services.
- B. The independent firm will perform the tests, inspections and other services specified in the individual specification Sections.
 - 1. Laboratory: Authorized to operate in the location in which the Project is located.
 - 2. Laboratory Staff: Maintain a full time registered Engineer on staff to review the services.
 - 3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either the National Bureau of Standards or to the accepted values of natural physical constants.
- C. Testing, inspections and source quality control may occur on or off the project site. Perform off-site testing as required by the Owner.

- D. Reports will be submitted by the independent firm to the Owner and the Design/Builder, in duplicate, indicating the observations and results of tests and indicating the compliance or non-compliance with Contract Documents.
- E. Cooperate with the independent firm; furnish samples of the materials, design mix, equipment, tools, storage, safe access, and the assistance by incidental labor as requested.
 - 1. Notify the Owner and the independent firm 24 hours prior to the expected time for operations requiring services.
 - 2. Arrange with the independent firm and pay for additional samples and tests required for the Design/Builder's use.
- F. Testing and employment of the testing agency or laboratory shall not relieve the Design/Builder of an obligation to perform the Work in accordance with the requirements of the Contract Documents.
- G. Re-testing or re-inspection required because of a non-conformance to the specified requirements is to be performed by the same independent firm on instructions by the Owner. Payment for the re-testing or re-inspection will be the Design/Builder's responsibility.
- H. Agency Responsibilities:
 - 1. Test samples of mixes submitted by the Design/Builder.
 - 2. Provide qualified personnel at the site. Cooperate with the Owner and the Design/Builder in performance of services.
 - 3. Perform specified sampling and testing of the products in accordance with the specified standards.
 - 4. Ascertain compliance of the materials and mixes with the requirements of the Contract Documents.
 - 5. Promptly notify the Owner and the Design/Builder of observed irregularities or non-conformance of the Work or products.
 - 6. Attend the preconstruction meetings and the progress meetings.
- I. Agency Reports: After each test, promptly submit two copies of the report to the Owner and to the Design/Builder. When requested by the Owner, provide an interpretation of the test results. Include the following:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Name of inspector.
 - 4. Date and time of sampling or inspection.
 - 5. Identification of product and specifications section.
 - 6. Location in the Project.
 - 7. Type of inspection or test.
 - 8. Date of test.
 - 9. Results of tests.
 - 10. Conformance with Contract Documents.
- J. Limits On Testing Authority:
 - 1. Agency or laboratory may not release, revoke, alter, or enlarge on the requirements of the Contract Documents.

2. Agency or laboratory may not approve or accept any portion of the Work.
3. Agency or laboratory may not assume any duties of the Design/Builder.
4. Agency or laboratory has no authority to stop the Work.

1.09 STATE MANDATED STRUCTURAL SPECIAL INSPECTIONS

- A. The Design/Builder is to provide the state-mandated Statement of Special Inspections from the Structural Engineer of Record and the Schedule of Special Inspection Services for this project.

1.10 MANUFACTURERS' FIELD SERVICES

- A. When specified in the individual specification Sections, require the material or Product suppliers, or manufacturers, to provide qualified staff personnel to observe the site conditions, the conditions of the surfaces and installation, the quality of workmanship, the start-up of equipment, or test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit the qualifications of the observer to the Owner thirty (30) days in advance of the required observations. The Observer is subject to approval by the Owner.
- C. Report the observations and the site decisions or instructions given to the applicators or installers that are supplemental or contrary to the manufacturers' written instructions.
- D. Refer to Section 01 33 00 - SUBMITTAL PROCEDURES, MANUFACTURERS' FIELD REPORTS article.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not used.

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SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Temporary Utilities:
 - 1. Temporary electricity.
 - 2. Temporary lighting for construction purposes.
 - 3. Temporary heating.
 - 4. Temporary cooling.
 - 5. Temporary ventilation.
 - 6. Telephone service.
 - 7. Computer E-mail service
 - 8. Temporary water service.
 - 9. Temporary sanitary facilities.
- B. Construction Facilities:
 - 1. Field offices, trailers and sheds.
 - 2. Temporary scaffolding
 - 3. Vehicular access.
 - 4. Parking.
 - 5. Progress cleaning and waste removal.
 - 6. Project identification.
 - 7. Traffic regulation.
- C. Temporary Controls:
 - 1. Barriers.
 - 2. Enclosures and fencing.
 - 3. Security.
 - 4. Fire detection.
 - 5. Water control.
 - 6. Dust control.
 - 7. Erosion and sediment control.
 - 8. Noise control.
 - 9. Pest control.
 - 10. Pollution control.
 - 11. Rodent control.
- D. Removal of utilities, facilities, and controls.

1.02 TEMPORARY ELECTRICITY

- A. The Owner will pay the cost of electricity used. Utilize the Owner's existing power service. Exercise measures to conserve energy.

- B. Complement the existing power service capacity and characteristics as required for construction operations.
- C. Permanent convenience receptacles may be utilized during construction.

1.03 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

- A. Provide and maintain lighting for construction operations to achieve a minimum lighting level of 2 watt/sq ft.
- B. Provide and maintain 1 watt/sq ft lighting to exterior staging and storage areas after dark for security purposes.
- C. Provide and maintain 0.25 watt/sq ft lighting to interior work areas after dark for security purposes.
- D. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails and lamps for specified lighting levels.
- E. Maintain lighting and provide routine repairs.
- F. Permanent building lighting may be utilized during construction.

1.04 TEMPORARY HEATING

- A. The Owner will pay the cost of temporary heat. Exercise measures to conserve energy. Utilize the Owner's existing heat plant, extend and supplement with temporary heat devices as needed to maintain the specified conditions for construction operations.
- B. Enclose the building prior to activating the temporary heat in accordance with the Enclosure article in this Section.
- C. Prior to the operation of permanent equipment for temporary heating purposes, verify that the installation is approved for operation, the equipment is lubricated and the filters are in place. Provide and pay for the operation, maintenance, and the regular replacement of filters and worn or consumed parts.
- D. Maintain a minimum ambient temperature of 50 degrees F in the areas where construction is in progress, unless indicated otherwise in the product Sections.

1.05 TEMPORARY COOLING

- A. The Owner will pay the cost of temporary cooling. Exercise measures to conserve energy. Utilize the Owner's existing cooling source, extend and supplement with temporary cooling devices as needed to maintain the specified conditions for construction operations.
- B. Enclose the building prior to activating the temporary cooling in accordance with the Enclosure article in this Section.

- C. Prior to operation of the permanent equipment for temporary cooling purposes, verify that the installation is approved for operation, the equipment is lubricated and the filters are in place. Provide and pay for the operation, maintenance, and the regular replacement of the filters and worn or consumed parts.
- D. Maintain a maximum ambient temperature of 80 degrees F in the areas where construction is in progress, unless indicated otherwise in the specifications.

1.06 TEMPORARY VENTILATION

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

1.07 TELEPHONE SERVICE

- A. The Design/Builder is required to insure the on-site Project Supervisor maintains a cell phone in their possession for the duration of the Contract.

1.08 COMPUTER E-MAIL SERVICE

- A. Provide, maintain and pay for a computer, tablet or equal electronic device with an internet connection capable of receiving e-mail at the Design/Builder's field office at the time of project mobilization and throughout the construction period.

1.09 TEMPORARY WATER SERVICE

- A. The Owner will pay the cost of temporary water. Exercise measures to conserve. Utilize the Owner's existing water system, extend and supplement with temporary devices as needed to maintain the specified conditions for construction operations.
- B. Extend branch piping with outlets located so that water is available by hoses with threaded connections. Provide temporary pipe insulation to prevent freezing.

1.10 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain the required facilities and enclosures. Existing facility use is not permitted. Provide facilities at the time of project mobilization.

1.11 FIELD OFFICES, TRAILERS AND SHEDS

- A. Existing building spaces may be used for field offices and storage in locations designated by the Owner.

- B. Storage Areas, Trailers and Sheds: Size to the storage requirements for the products of the individual Sections, allowing for access and orderly provision for the maintenance and for the inspection of Products to the requirements of Section 01 60 00.
- C. Preparation: Fill and grade the sites for the temporary structures to provide drainage away from the buildings.
- D. Maintenance and Cleaning
 - 1. Weekly janitorial services for the offices, periodic cleaning and maintenance for the office and storage areas.
 - 2. Maintain the approach walks free of mud, water, and snow.
- E. Removal: At the completion of the Work remove the buildings, foundations, utility services, and debris. Restore the areas.

1.12 TEMPORARY SCAFFOLDING

- A. Design/Builder is to provide temporary scaffolding as necessary for construction purposes.
- B. The scaffolding is to be braced properly, assembled and installed as required to meet all OSHA requirements.
- C. Remove from the site all scaffolding, associated bracing and supports upon completion of construction. Repair all surfaces and site to original condition.

1.13 HOISTING

- A. Design/Builder is responsible for all hoisting required to facilitate, serve, stock, clean, and complete the Work. Include all costs for Operating Engines, fuel, delivery and removal, mobilization, staging, protection of grades and surfaces, and equipment.

1.14 VEHICULAR ACCESS

- A. Provide unimpeded access for emergency vehicles. Maintain 20 foot width driveways with turning space between and around combustible materials.
- B. Provide and maintain access to fire hydrants and control valves free of obstructions.
- C. Remove mud from construction vehicle wheels before entering streets. Cleanup dirt, rocks, and debris that fall on street from construction vehicles.

1.15 PARKING

- A. Arrange for temporary surface parking areas to accommodate the construction personnel.
- B. Location must be approved by the Owner.

- C. When site space is not adequate, arrange through the Owner for additional off-site parking.
- D. Tracked vehicles are not allowed on paved areas.
- E. Maintenance:
 - 1. Maintain the traffic and parking areas in a sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
 - 2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain the paving and drainage in original, or specified, condition.
- F. Removal, Repair:
 - 1. Remove temporary materials at Substantial Completion.
 - 2. Remove underground work and compacted materials to a depth of 2 feet; fill and grade the site as specified.
 - 3. Repair existing and permanent facilities damaged by use, to the original or specified condition.

1.16 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain the site in a clean and orderly condition.
- B. Collect and remove waste materials, debris, and rubbish from the site periodically, weekly, or daily, as necessary to prevent an on-site accumulation of waste material, debris, and rubbish, and dispose off-site.
- C. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.
- D. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other or remote spaces, prior to enclosing the space.
- E. Sweep and vacuum clean the interior areas prior to the start of surface finishing, and continue cleaning to eliminate dust.

1.17 PROJECT IDENTIFICATION

- A. Project Identification Sign:
 - 1. Provide one sign at each construction site as described below.
 - 2. One sign, 32 sq ft area (4'x8'), bottom 4 feet above the ground.
 - 3. Sign Backing Material: minimum 3/4" plywood A-B exterior grade APA
 - 4. Posts: 4"x4" pressure treated imbedded into ground minimum 3'-6".
 - 5. Fasteners: Use minimum 1/2-inch diameter button head carriage bolts to fasten sign panels to supporting structures or #10 x 2 1/2" zinc wood screws spaced at 6" on center.
 - 6. The plywood will be faced with a solid vinyl signage material adhered to the surface containing the information below.
 - 7. Content:

- a. Project title, and name & logo (seal) of the Owner.
 - b. Names and titles of the authorities.
 - c. Name of the Design/Builder.
 - d. Optional rendering of project.
 8. Graphic design, colors and style of lettering is to be provided by the Owner.
 9. Printing company shall submit the layout and design to Owner for approval prior to printing sign.
 10. Design the sign and the structure to withstand a 60 miles/hr wind velocity.
- B. Installation:
1. Install the project identification sign within fifteen (15) days after the date of receipt of the Notice to Proceed.
 2. Erect at the designated location or as approved by the Owner.
 3. Erect the supports and framing on a secure foundation, rigidly braced and framed to resist wind loading.
 4. Install the sign surface plumb and level. Anchor securely.
 5. Paint exposed surfaces of the sign, supports, and framing.
- C. Maintenance: Maintain the signs and supports clean, repair deterioration and damage.
- D. Removal: Remove the signs, framing, supports, and foundations at the completion of the Project and restore the area.
- E. Project Informational Signs:
1. Painted informational signs of same colors and lettering as the Project Identification sign, or standard products; size lettering to provide legibility at 100 foot distance.
 2. Provide sign at each field office, storage shed, and directional signs to direct traffic into and within site. Relocate as the Work progress requires.
 3. No other signs are allowed without the Owner's permission except those required by law.

1.18 TRAFFIC REGULATION

- A. Signs, Signals, And Devices:
1. Post Mounted and Wall Mounted Traffic Control and Informational Signs: As approved by local jurisdictions.
 2. Traffic Cones and Drums, Flares and Lights: As approved by local jurisdictions.
 3. Flagperson Equipment: As required by local jurisdictions.
- B. Flag Persons: Provide trained and equipped flag persons to regulate the traffic when construction operations or traffic encroach on the public traffic lanes.
- C. Flares and Lights: Use flares and lights during the hours of low visibility to delineate the traffic lanes and to guide traffic.
- D. Haul Routes:
1. Consult with the authority having jurisdiction; establish the public thoroughfares to be used for haul routes and site access.
 2. Confine the construction traffic to the designated haul routes.

3. Provide traffic control at the critical areas of the haul routes to regulate traffic, to minimize interference with the public traffic.
- E. Traffic Signs:
 1. At approaches to the site and on site, install at crossroads, detours, parking areas, and elsewhere as needed to direct the construction and affected public traffic.
 2. Relocate as the Work progresses, to maintain effective traffic control.
- F. Removal:
 1. Remove equipment and devices when no longer required.
 2. Repair damage caused by installation.
 3. Remove post settings to a depth of 2 feet.

1.19 BARRIERS

- A. Provide barriers to prevent unauthorized entry to the construction areas, to allow for the Owner's use of the site, and to protect existing facilities and adjacent properties from damage from the construction operations, or demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way, or for public access to and egress from the existing building.
- C. Provide protection for plants designated to remain. Replace damaged plants.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.20 ENCLOSURES AND FENCING

- A. Construction: Commercial grade chain link fence.
 1. Provide a six (6) foot high fence around the construction site; equip with vehicular and pedestrian gates with locks. Provide one set of keys to all gates to the owner.
- B. Exterior Enclosures:
 1. Provide a temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for the products, to allow for temporary heating and maintenance of the required ambient temperatures identified in the individual specification Sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.
- C. Interior Enclosures:
 1. Provide temporary partitions as necessary to separate the work areas from the Owner-occupied areas, to prevent penetration of dust and moisture into the Owner occupied areas, and to prevent damage to the existing materials and equipment.
 2. Construction: Framing and reinforced fire-resistant polyethylene, plywood, or gypsum board sheet materials with closed joints and sealed edges at intersections with existing surfaces.
 - a. Insulated to R 11.
 - b. STC rating of 35 in accordance with ASTM E90.
 - c. Maximum flame spread rating of 75 in accordance with ASTM E84.

1.21 SECURITY

- A. Security Program:
 - 1. Protect the Work, the existing premises, or the Owner's operations from theft, vandalism, and unauthorized entry.
 - 2. Initiate the program at the mobilization.
 - 3. Maintain the program throughout the construction period until Owner occupancy.
- B. Entry Control:
 - 1. Restrict the entrance of persons and vehicles into the Project site, or the existing facilities.
 - 2. Allow entrance only to authorized persons with the proper identification.
 - 3. Maintain a log of workers and visitors and make available to the Owner on request.
 - 4. Coordinate the access of the Owner's personnel to the site in coordination with the Owner's security forces.

1.22 FIRE DETECTION

- A. Before beginning any construction that can potentially trigger the existing fire detection system, notify the Owner and request to temporarily disconnect the system in the specific areas of construction, for as long as may be necessary.

1.23 WATER CONTROL

- A. Grade the site to drain. Maintain excavations free of water. Provide, operate, and maintain the pumping equipment.
- B. Protect the site from puddling or running water. Provide water barriers as required to protect the site from soil erosion.

1.24 DUST CONTROL

- A. Execute the Work by methods to minimize raising dust from construction operations.
- B. Provide positive means to prevent air-borne dust from dispersing into the atmosphere.

1.25 EROSION AND SEDIMENT CONTROL

- A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
- B. Minimize the amount of bare soil exposed at one time.
- C. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
- D. Construct the fill and waste areas by selective placement to avoid erosive surface silts or clays.

- E. Periodically inspect the earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

1.26 NOISE CONTROL

- A. Provide methods, means, and facilities to minimize noise produced by the construction operations.
- B. Restrictions on Noise:
 - 1. Use equipment with well-maintained mufflers.
 - 2. Use the least noisy techniques practical.
 - 3. Schedule noisy activities when ambient background noise level is highest.
 - 4. Turn off all unneeded and idling equipment and engines.
 - 5. Locate noise sources as far as practical from noise sensitive locations.
 - 6. Orient noise sources away from noise sensitive locations

1.27 PEST CONTROL

- A. Provide methods, means, and facilities to prevent pests and insects from damaging the Work, or entering the facility.

1.28 POLLUTION CONTROL

- A. Provide methods, means, and facilities to prevent the contamination of soil, water, and the atmosphere from discharge of noxious, toxic substances, and pollutants produced by the construction operations.

1.29 RODENT CONTROL

- A. Provide methods, means, and facilities to prevent rodents from accessing or invading the premises.

1.30 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, and materials prior to Substantial Completion.
- B. Remove the underground installations to a minimum depth of 2 feet. Grade the site as indicated.
- C. Clean and repair the damage caused by installation or use of temporary work.
- D. Restore the existing facilities used during construction to the original condition. Restore the permanent facilities used during construction to the specified condition.

PART-2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

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SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.
- E. Product substitution procedures.

1.02 PRODUCTS

- A. Products: Means new material, machinery, components, fixtures, or systems forming the Work; but does not include the machinery or equipment used for the preparation, fabrication, conveying, or erection of the Work. Products may include the existing materials or components required or specified for reuse.
- B. Furnish products of qualified manufacturers suitable for the intended use. Furnish products of each type by a single manufacturer unless specified otherwise.
- C. Do not use materials and equipment removed from the existing premises, except as specifically permitted by the Contract Documents.
- D. Furnish interchangeable components of the same manufacturer for the components being replaced.

1.03 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products in accordance with the manufacturer's instructions.
- B. Promptly inspect shipments to ensure that the products comply with the requirements, the quantities are correct, and the products are undamaged.
- C. Provide equipment and personnel to handle the products by methods to prevent soiling, disfigurement, or damage.

1.04 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect the products in accordance with the manufacturers' instructions.
- B. Store with seals and labels intact and legible.

- C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to the product.
- D. For exterior storage of fabricated products, place on sloped supports above the ground.
- E. Provide bonded off-site storage and protection when the site does not permit on-site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent the condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store the products by methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of the products to permit access for inspection. Periodically inspect to verify that the products are undamaged and are maintained in acceptable condition.

1.05 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of one of the manufacturers named and meeting the specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named in accordance with the following article.

1.06 PRODUCT SUBSTITUTION PROCEDURES

- A. AIA Document A701 - Instructions to Bidders Paragraph 3.3 specifies the time restrictions for submitting requests for Substitutions during the bidding period to requirements specified in this section.
- B. Substitutions may be considered when only one product is specified in a section and that product is no longer in production following the date of receipt of the Notice to Proceed. Submit certification both that specified product was carried in Bid, and is no longer obtainable.
- C. Document each request with complete data substantiating the compliance of a proposed Substitution with the Contract Documents.
- D. A request constitutes a representation that the Bidder:

1. Has investigated the proposed Product and determined that it meets or exceeds the quality level of the specified product.
 2. Will provide the same warranty for the Substitution as for the specified Product.
 3. Will coordinate the installation and make changes to other Work that may be required for the Work to be complete with no additional cost to the Owner.
 4. Waives claims for additional costs or time extension that may subsequently become apparent.
 5. Will reimburse the Owner for review or redesign services associated with re-approval by the authorities having jurisdiction.
- E. Substitutions will not be considered when they are indicated or implied on the Shop Drawing or Product Data submittals, without a separate written request, or when acceptance will require revision to the Contract Documents.
- F. Substitution Submittal Procedure, if permitted following Contract award:
1. Submit three copies of a request for Substitution for consideration, no later than 20 working days following date of receipt of the Purchase Order for this Contract. Limit each request to one proposed Substitution.
 2. Submit the Shop Drawings, Product Data, and the certified test results attesting to the proposed product equivalence. Provide direct comparison between the specified product and the proposed substitution. The burden of proof is on the proposer.
 3. The Owner will notify the Design/Builder in writing of a decision to accept or reject the request.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

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SECTION 01 70 00

EXECUTION REQUIREMENTS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Examination.
- B. Preparation.
- C. Field Engineering.
- D. Protection of adjacent construction.
- E. Cutting and patching.
- F. Special procedures.
- G. Progress cleaning and waste removal.
- H. Final cleaning.
- I. Starting and adjusting of systems.
- J. Demonstration and Instructions.
- K. Testing and adjusting.
- L. Protecting Installed Construction.

1.02 EXAMINATION

- A. Acceptance of Conditions:
 - 1. Verify that the existing applicable site conditions, substrates, or substrate surfaces are acceptable or meet the specific requirements of the individual specifications Sections, for subsequent Work to proceed.
 - 2. Verify that the existing substrate is capable of structural support or attachment of new Work being applied or attached.
 - 3. Examine and verify specific conditions described in the individual specifications Sections.
 - 4. Verify that utility services are available, of the correct characteristics, and in the correct locations.
 - 5. Beginning of new Work, that relies upon the quality and proper execution of the Work of a preceding trade, means acceptance of that preceding Work as appropriate for the proper execution of subsequent Work.

6. Acceptance of preceding Work that can be shown later to have adversely affected proper performance of new Work may result in removal and repeat performance of all Work involved at no cost to the Owner.

1.03 PREPARATION

- A. Clean substrate surfaces prior to applying the next material or substance.
- B. Seal cracks or openings of the substrate prior to applying the next material or substance.
- C. Apply a manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.
- D. Prior to the application, installation, or erection of any products and product components, perform any other preparatory operations, or surface or substrate modifications, as may be specified or directed by the product manufacturers.

1.04 FIELD ENGINEERING

- A. Employ a Land Surveyor registered in the State of Rhode Island and acceptable to the Owner.
- B. Locate and protect the survey control and reference points. Promptly notify the Owner of any discrepancies discovered.
- C. Control Datum for the survey is that established by the Owner provided survey, shown on the Drawings
- D. Verify setbacks and easements, if any; confirm the drawing dimensions and elevations.
- E. Provide field engineering services. Establish elevations, lines, and levels, utilizing recognized engineering survey practices.
- F. Submit a copy of the site drawings and certificate signed by the Land Surveyor that the elevations and locations of the Work are in conformance with the Contract Documents.
- G. Maintain a complete and accurate log of the control and survey work as it progresses.
- H. If required by the Owner, on completion of the foundation walls and major site improvements, prepare a certified survey illustrating the dimensions, locations, angles, and elevations of the construction and site work.
- I. Protect the survey control points prior to starting the site work; preserve the permanent reference point during construction.
- J. Promptly report to the Owner the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

- K. Replace the dislocated survey control point based on the original survey control. Make no changes without prior written notice to the Owner.

1.05 PROTECTION OF ADJACENT CONSTRUCTION

- A. Protect the existing adjacent properties and provide special protection where specified in the individual Specification Sections.
- B. Provide protective coverings at wall, projections, jambs, sills, and soffits of the existing openings.
- C. Protect the existing finished floors, stairs, and other existing surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- D. Repair adjacent properties damaged by the construction operations to the original condition to the satisfaction of the Owner.
- E. Prohibit unnecessary traffic from the existing landscaped areas.
- F. Restore the grassed landscaped areas damaged by the construction operations to a full healthy growth by installing loam and sod.

1.06 CUTTING AND PATCHING

- A. Employ the original, or skilled and experienced installer to perform cutting and patching.
- B. Submit a written request in advance of the cutting or altering elements which affect:
 - 1. Structural integrity of element.
 - 2. Integrity of weather-exposed or moisture-resistant elements.
 - 3. Efficiency, maintenance, or safety of the element.
 - 4. Visual qualities of sight-exposed elements.
 - 5. Existing construction, or the Work of separate contractor.
- C. Execute cutting, fitting, and patching including excavation and fill, to complete the Work, and to:
 - 1. Fit the several parts together, to integrate with the other Work.
 - 2. Uncover Work to install or correct ill-timed Work.
 - 3. Remove and replace defective and non-conforming Work.
 - 4. Remove samples of installed Work for testing.
 - 5. Provide openings in the elements of Work for penetrations of mechanical and electrical Work.
- D. Execute Work by methods that will avoid damage to other Work, and provide proper surfaces to receive patching and finishing.
- E. Cut masonry, concrete, and other rigid materials using a masonry saw or core drill.
- F. Restore the Work with new Products in accordance with the requirements of Contract Documents.
- G. Fit Work tight to the pipes, sleeves, ducts, conduits, and other penetrations through surfaces.

- H. Maintain the integrity of the wall, ceiling, or floor construction; completely seal voids.
- I. At the penetration of fire rated partition, ceiling, or floor construction completely seal the voids with a fire rated or fire resistant material to the full thickness of the penetrated element as required to equal the rating of the surrounding construction.
- J. Refinish surfaces to match the adjacent finishes. For continuous surfaces refinish to nearest intersection; for an assembly refinish the entire unit.
- K. Identify any hazardous substance or conditions exposed during the Work to the Owner for a decision or remedy.

1.07 SPECIAL PROCEDURES

- A. Materials: As specified in the product Sections; match the existing with new products, or salvaged products as appropriate, for patching and extending work.
- B. Employ a skilled and experienced installer to perform alteration work.
- C. Cut, move, or remove items as necessary for access to the alterations and renovation Work. Replace and restore at completion.
- D. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace the materials as specified for finished Work.
- E. Remove the debris and abandoned items from the area and from concealed spaces.
- F. Prepare the surface and remove surface finishes to provide the installation of new Work and finishes,
- G. Close the openings in exterior surfaces to protect the existing Work from the weather and extremes of temperature and humidity.
- H. Remove, cut, and patch the Work in a manner to minimize damage and to provide a means of restoring products and finishes to the original or specified condition.
- I. Refinish the existing visible surfaces to remain in renovated rooms and spaces to the specified condition for each material, with a neat transition to the adjacent finishes.
- J. Where new Work abuts or aligns with the existing, provide a smooth and even transition. Patch the Work to match the existing adjacent Work in texture and appearance.
- K. When finished surfaces are cut so that a smooth transition with the new Work is not possible, terminate the existing surface along a straight line at a natural line of division and submit a recommendation to the Owner for review.
- L. Where a change of plane of 1/4 inch or more occurs, submit a recommendation for providing a smooth transition to the Owner for review.

- M. Trim existing doors as necessary to clear new floor finish. Refinish the trim as required.
- N. Patch or replace the portions of existing surfaces which are damaged, or showing other imperfections.
- O. Finish surfaces as specified in the individual product Sections or as indicated on the Drawings.

1.08 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain the site in a clean and orderly condition.
- B. Remove the debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
- C. Sweep and vacuum clean the interior areas prior to the start of surface finishing, and continue cleaning to eliminate dust.
- D. Collect and remove the waste materials, debris, and rubbish from the site periodically or weekly and dispose of off-site.
- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.09 FINAL CLEANING

- A. Execute final cleaning of areas affected by the Work prior to the final project assessment.
- B. Clean the interior and exterior glass surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- C. Clean the equipment and fixtures to a sanitary condition using cleaning materials appropriate to the surface and material being cleaned.
- D. Clean or replace filters of operating equipment as directed by the Owner.
- E. Clean the debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean the site; sweep the paved areas, rake clean the landscaped surfaces.
- G. Remove the waste and surplus materials, rubbish, and the construction facilities from the site.

1.10 STARTING AND ADJUSTING OF SYSTEMS

- A. Coordinate the schedule for the starting and adjusting of various equipment and systems.
- B. Notify the Owner seven days prior to the starting and adjusting of each item.

- C. Verify that each piece of equipment or system has been checked for the proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.
- D. Verify that the tests, meter readings and the specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Execute the starting and adjusting under the supervision of the responsible Design/Builder's personnel or manufacturer's representative, in accordance with the manufacturer's instructions.
- G. Adjust the operating Products and equipment to ensure smooth and unhindered operation.
- H. When specified in the individual specifications Section, require the manufacturer to provide the authorized representative to be present at the site to inspect, check, and approve the equipment or system installation prior to starting, and to supervise the placing of equipment or system in operation.
- I. Submit a written report in accordance with Section 01 43 00 that the equipment or system has been properly installed and is functioning correctly.

1.11 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate the operation and maintenance of Products to the Owner's personnel two weeks prior to the date of Substantial Completion.
- B. For equipment or systems requiring seasonal operation, perform a demonstration for the other season within six months.
- C. Utilize the operation and maintenance manuals as the basis for instruction. Review the manuals with the Owner's personnel in detail to explain all aspects of the operation and maintenance.
- D. Demonstrate the start-up, operation, control, adjustment, trouble shooting, servicing, maintenance, and shutdown of each item of equipment at a scheduled or agreed upon time, at the equipment or system location.
- E. Prepare and insert additional data in the operations and maintenance manuals when the need for additional data becomes apparent during the instruction.

1.12 TESTING, ADJUSTING, AND BALANCING

- A. Submit, for the Owner's approval, the name of an independent firm to perform testing, adjusting, and balancing.
- B. The independent firm will perform the services specified in the individual specifications Sections.

- C. Reports will be submitted by the independent firm to the Owner indicating the observations and test results, indicating the compliance or non-compliance with the specified requirements and with the requirements of the Contract Documents.

1.13 PROTECTING INSTALLED CONSTRUCTION

- A. Protect the installed Work and provide special protection where specified in the individual specification sections.
- B. Provide temporary and removable protection for the installed products. Control activity in the immediate work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Repair or replace the installed Work damaged by construction operations, as directed by the Owner.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

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SECTION 01 74 19

WASTE MATERIALS MANAGEMENT AND RECYCLING

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of each prime Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 WASTE MANAGEMENT GOALS FOR THE PROJECT

- A. The Owner has established that this Project shall generate the least amount of waste possible and that processes shall be employed that ensure the generation of as little waste as feasible including prevention of damage due to mishandling, improper storage, contamination, inadequate protection or other factors as well as minimizing overall packaging and poor quantity estimating.
- B. Of the inevitable waste that is generated, the waste materials designated in this specification shall be salvaged for reuse or recycling. Waste disposal in landfills or incinerators shall be minimized. On new construction projects this means careful recycling of job site waste, on demolition projects this also means careful removal for salvage.

1.3 SUMMARY:

- A. This Section includes required salvage and recycling of the following waste materials and applies to all such listed waste materials produced during the course of this Contract:
 - 1. Land Clearing Debris: Solid waste generated solely from land clearing operations, such as stumps and trees.
 - a. See Division 2 "Site Clearing" section for requirements for salvage and processing of designated materials to produce mulch for use in landscape construction for this project. Material required for production of landscape mulch is not classified as "land clearing debris."
 - 2. Concrete, Masonry, and Other Inert Fill Material: Concrete, brick, rock, clean soil not intended for other on-site use, broken up asphalt pavement containing no ABC stone, clay, concrete, or other contaminants, and other inert material.
 - 3. Metals: Metal scrap including iron, steel, copper, brass, and aluminum.
 - 4. Untreated Wood: Unpainted, untreated dimensional lumber, plywood, oriented strand board, masonite, particleboard, and wood shipping pallets.
 - 5. Gypsum Wallboard Scrap: Excess drywall construction materials including cuttings, other scrap, and excess materials.
 - 6. Cardboard: Clean, corrugated cardboard such as used for packaging, etc.
 - 7. Paper: Discarded office refuse such as unwanted files, correspondence, etc.
 - 8. Plastic Buckets: Containers for various liquid and semi-solid or viscous construction materials and compounds.
 - 9. Beverage Containers: Aluminum, glass, and plastic containers.
 - 10. Other Mixed Construction and Demolition Waste: Solid waste resulting solely from construction, remodeling, repair, or demolition operations on pavement, buildings, or other structures exclusive of waste materials listed herewith. 11. Materials to be salvaged if possible:

- a. Dimensioned Lumber and Heavy Timbers.
- b. Wood siding.
- c. Structural Steel.
- d. Wood Paneling, molding, trim and Wainscoting.
- e. Heritage architectural elements such as mantle pieces, columns, etc.
- f. Cabinets and casework.
- g. Insulation.
- h. Brick and block.
- i. Electric Equipment and Light Fixtures.
- j. Plumbing fixtures and brass.
- k. Windows, doors and frames.
- l. Hardwood flooring.

B. Non-Recyclable Waste: Collect and segregate non-recyclable waste for delivery to a permitted landfill site.

- 1. Mixed Solid Waste: Solid waste usually collected as a municipal service, exclusive of waste materials listed above.

1.4 HAZARDOUS MATERIAL SUSPICION

- A. If, during the course of construction, the Design/Builder suspects a material to contain asbestos, all work involving the material is to be stopped and the Owner notified immediately of the suspicion. Until the material is confirmed to be safe or tested and determined to be an asbestos containing material, the Design/Builder is to assume it contains asbestos and is to avoid contact. Upon notification of its composition the Owner will determine the course of action and inform the Design/Builder accordingly.

1.5 DEFINITIONS:

- A. Waste Materials are defined as large and small pieces of the materials indicated which are excess to the contract requirements and generally include materials which are to be salvaged from existing construction and items of trimmings, cuttings and damaged goods resulting from new installations, which can not be effectively used in the Work.

1.6 SUBMITTALS:

- A. Show compliance with regulations specified under "Quality Assurance" article below. Include a list of recycling facilities to which indicated recyclable materials will be distributed for disposal. Identify materials that are not recyclable or otherwise conservable that must be disposed of in a landfill or other means acceptable under governing State and local regulations. List permitted landfills and/or other disposal means to be employed. Indicate any instances where compliance with requirements of this specification does not appear to be possible and request resolution from the Owner.
- B. Delivery Receipts: Provide delivery receipts for waste materials salvaged and sent to permitted waste materials processors or recyclers within 48 hours of delivery that indicate the location and name of firm accepting recyclable waste materials, types of materials, net weights of each type, date of delivery and value of materials. Hazardous weights are not to be included.

- C. Application for Payments: The Design/Builder shall submit with each Application for Payment a summary of waste materials, recycled, salvaged and disposed of using a form generated by the Design/Builder and approved by the Owner. Failure to submit this information shall render the Application for Payment incomplete and shall delay Payment. The Summary shall contain the following information: For each material salvaged and recycled from the Project, include the amount (in cubic yards or tons or in the case of salvaged items state quantities by number, type and size of items) and the destination (i.e. recycling facility, used building materials yard). For each material land filled or incinerated from the Project, include the amount (in cubic yards or tons) of material and the identity of the landfill, incinerator or transfer station.

1.7 QUALITY ASSURANCE:

- A. Regulatory Requirements: Comply with all applicable requirements of the federal, state or local authorities concerning Management of Construction, Demolition, Land Clearing, Inert, and Yard Trash Debris
- B. Disposal Sites, Recyclers, and Waste Materials Processors: Use only facilities properly permitted by the State and by local authorities where applicable.
- C. Implementation: Include a discussion of waste management and recycling in worker orientation. Provide on-site instruction on appropriate separation, handling, recycling, and salvaging methods to be used by all parties at the appropriate stages of the work at the site. Include waste management and recycling discussion in pre-fabrication meetings with subcontractors and fabricators. Also include discussion of waste management and recycling in regular job meetings and job safety meetings conducted during the course of work at the site.

1.8 STORAGE AND HANDLING:

- A. Site Storage: Remove all indicated recyclable materials from the work location to approved containers daily. Failure to remove waste materials will be considered cause for withholding payment and termination of Contract.
- B. Position covered containers for recyclable waste materials at a designated location on the Project Site. Select a location for the recyclable materials containers separated from that of general waste and rubbish containers. Provide separate collection containers for a minimum of the following materials:
 - 1. Untreated lumber.
 - 2. Gypsum wallboard.
 - 3. Paper, paper products, and cardboard.
 - 4. Plastics.
 - 5. Metals.
 - 6. Glass.
 - 7. Other salvageable materials.
- C. Change out loaded containers for empty ones as demand requires, but not less than weekly.
- D. Handling: Deposit all indicated recyclable materials in the containers in a clean (no mud, adhesives, solvents, petroleum contamination), debris-free condition. Do not deposit contaminated materials into the containers until such time as such materials have been cleaned.

- E. If the contamination chemically combines with the material so that it can not be cleaned, do not deposit into the recycle containers. Comply disposal with all legal and regulatory requirements.

1.9 PROJECT/SITE CONDITIONS:

- A. Environmental Requirements: Transport recyclable waste materials from the Work Area to the recycle containers and carefully deposit in the containers without excess noise and interference with other activities, in a manner to minimize noise and dust. Reclose container covers immediately after materials are deposited.
 - 1. Do not place recyclable waste materials on the ground adjacent to a container.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 WASTE MANAGEMENT:

- A. General: Implement waste management procedures throughout the life of this Contract.
- B. Source Separation: Separate, store, protect, and handle at the project site all identified recyclable and salvageable waste products to prevent contamination of materials and maximize recyclability and salvageability of materials.
- C. Arrange for the regular collection, transport from the site, and delivery to respective approved recycling centers of indicated recyclable waste materials. Maintain records accessible to the Owner for verification of construction waste materials recycling.
- D. Delivery Receipts: Arrange for timely pickups from the site or deliveries to approved recycling facilities of designated waste materials to keep construction site clear and prevent contamination of recyclable materials. Keep and maintain records of all deliveries to recycling facilities and all pickups of waste materials at the site by others as specified above.

3.2 RECYCLABLE WASTE MATERIALS HANDLING:

- A. General: The following paragraphs supplement handling requirements for various materials identified for classification and recycling listed in Part 1 "Summary" article above.
- B. Paper: Classify and handle waste paper goods as follows:
 - 1. Bond Paper: As generally found in the construction offices and used for specifications, correspondence, copiers, printers and FAX machines. Collect in a separate container at each workstation and deposit loose in the appropriate recycle container daily.
 - 2. Newsprint: Newspapers and tabloid style advertising. Collect in a single location and deposit daily in the appropriate recycle container.
 - 3. Prints (drawings): Set up a single location for collection. Roll together to minimize space. Deposit daily in the appropriate recycle container.
- C. Packaging materials:
 - 1. Cardboard and paperboard cartons and boxes: Knock-down, fold flat and deposit in the appropriate recycle container.
 - 2. Paper packing materials (separators, stiffeners, etc.) shall be placed in the same container.

3. Newsprint, used as packing (shredded or whole), shall be deposited in the recyclable container for newsprint.
 4. Plastic (polystyrene peanuts and other shapes) shall be deposited in the recyclable container for plastics.
 5. Metal and plastic banding materials shall be deposited in the appropriate container.
- D. Metals: Cut all items to lengths and sizes to fit within the container provided, when necessary. Where there is sufficient quantity of a specific recyclable waste item (for example; salvaged metal roofing or duct work), make special arrangements for items to be bundled, banded or tied, and stack in a designated location for a special pick-up. Coordinate all special arrangements with the Owner.
- E. Plastics: Collect recyclable plastics (polystyrene and others specifically marked for recycling) daily from work areas and deposit in designated containers.
- F. Glass: Remove waste glass products (sheet, bottles, etc.) daily from the work area and deposit in designated containers. Glass containing imbedded wire (typical in some fire rated doors having glazed lights) is not recyclable.
- G. Gypsum Wallboard: Separate gypsum wallboard from other wastes. Dispose of waste gypsum wallboard off-site at a gypsum reclamation or recycling facility.
- H. Other Items: Where recyclability classification of any given waste material is unclear, verify with the Owner.

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SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Closeout procedures.
- B. Quality assurance.
- C. Maintenance service.
- D. Owner's Manuals
- E. Operations and maintenance manuals.
- F. Materials and finishes manuals.
- G. Equipment and systems manuals
- H. Spare parts and maintenance materials.
- I. Product warranties and product bonds.
- J. Project Record documents.
- K. Project close out inspections – Punch List

1.02 CLOSEOUT PROCEDURES

- A. Submit a written certification that the Contract Documents have been reviewed, the Work has been inspected, and that the Work is complete in accordance with the Contract Documents and is ready for the Owner's review.
- B. Provide submittals to Owner that are required by the governing or other authorities, including the following closeout documents:
 - 1. AIA Document G706 - Contractor's Affidavit of Payment of Debts and Claims, 1994 Edition.
 - 2. AIA Document G706A - Contractor's Affidavit of Release of Liens, 1994 Edition.
 - 3. AIA Document G707 - Consent of Surety to Final payment, 1994 Edition.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- D. The Owner will occupy all portions of the building as specified in Section 01 10 00.

- E. Provide submittals to Owner that are required by governing or other authorities, including abatement invoices correctly prepared as prescribed in Section 02 81 13. Failure to include correctly prepared abatement invoices will delay issuing of final payment.

1.03 QUALITY ASSURANCE

- A. Employ personnel assembling submittals experienced in the maintenance and the operation of the described products and systems.

1.04 MAINTENANCE SERVICE

- A. Submit a contract for furnishing service and maintenance of the components indicated in the specification Sections for one year from date of Substantial Completion, or during the warranty period, whichever period of time is the longest.
- B. Provide for an examination of the system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
- C. Include a systematic cleaning, examination, adjustment, and lubrication of the components. Repair or replace the parts whenever required. Use the parts produced by the manufacturer of the original component.
- D. Do not assign or transfer the maintenance service to an agent or Subcontractor without the prior written consent of the Owner.

1.05 OWNER'S MANUALS

- A. Submit the data for Operations and Maintenance, Materials and Finishes, and Equipment and Systems Manuals bound in 8-1/2 x 11 inch text pages, in maximum 2 inch size, D side three - ring commercial quality binders with durable cleanable plastic covers.
- B. Prepare binder covers with the printed title of the manual, title of the project, and the subject matter of binder when multiple binders are required.
- C. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Drawings: Provide with reinforced punched binder tab. Bind in with the text; fold the larger drawings to the size of the text pages.
- E. Submit one copy of the completed volumes for review. They will be reviewed and returned with the Owner's comments. Revise the content of the manuals as required prior to final submission.
- F. Submit one set of revised final volumes in final form.
- G. Submit one copy of all the manuals for Operations and Maintenance, Materials and Finishes, and Equipment and Systems in PDF electronic format on a Compact Disc or DVD.

1.06 OPERATIONS AND MAINTENANCE MANUALS

- A. Contents: Prepare the Table of Contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
 - 1. Part 1: Directory, listing the names, addresses, and telephone numbers of the Owner, Design/Builder, Subcontractors, and major equipment suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by the specification Section. For each category, identify the names, addresses, and telephone numbers of the Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
 - 3. Part 3: Project documents and certificates, including the following:
 - a. Shop drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Photocopies of warranties and bonds.
 - e. MSDS for applicable products.

1.07 MATERIALS AND FINISHES MANUALS

- A. Instruction for Care and Maintenance: include manufacturer's instructions for cleaning agents and methods, precautions against detrimental agents and methods, and a recommended schedule for cleaning and maintenance.
- B. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.
- C. Include Material Safety Data Sheets (MSDS) for all applicable products. These are required to provide both workers and emergency personnel with the proper procedures for handling or working with a particular substance. MSDS's include information such as physical data (melting point, boiling point, flash point etc.), toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill/leak procedures.
- D. Additional Requirements: As specified in the individual product specification Sections.
- E. Include a listing in the Table of Contents for design data, with a tabbed flysheet and a space for the insertion of data.

1.08 EQUIPMENT AND SYSTEMS MANUALS

- A. For equipment, or component parts of equipment put into service during construction and operated by the Owner, submit documents within 10 days after acceptance.
- B. Each Item of Equipment and Each System: Include a description of the unit or system, and the component parts. Identify the function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.
- C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; by label machine.
- D. Include color-coded wiring diagrams as installed.
- E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shutdown, and emergency instructions. Include summer, winter, and special operating instructions.
- F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and troubleshooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- G. Include a servicing and lubricating schedule, and a list of lubricants required.
- H. Include the manufacturer's printed operation and maintenance instructions.
- I. Include sequence of operation by the controls manufacturer.
- J. Include the original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- K. Include control diagrams by the controls manufacturer as installed.
- L. Include the Design/Builder's coordination drawings, with color-coded piping diagrams as installed.
- M. Include charts of valve tag numbers, with the location and function of each valve, keyed to the flow and control diagrams.
- N. Include a list of the original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- O. Include test and balancing reports as specified in Section 01 43 00.
- P. Additional Requirements: As specified in the individual product specification Sections.
- Q. Include a listing in the Table of Contents.

1.09 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Furnish spare parts, maintenance, and extra products in the quantities specified in the individual specification Sections.
- B. Deliver to the Project site and place in a location as directed by the Owner; obtain a receipt prior to final payment.

1.10 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in duplicate by the responsible subcontractors, suppliers, and manufacturers, within 10 days after the completion of the applicable item of work.
- B. Execute and assemble the transferable warranty documents and bonds from the subcontractors, suppliers, and manufacturers.
- C. Verify that the documents are in the proper form, contain full information, and are notarized.
- D. Co-execute the submittals when required.
- E. Submit two copies in D side three ring binders with a durable plastic cover.
- F. Submit prior to the final Application for Payment.
- G. Time of Submittals:
 - 1. For equipment or component parts of equipment put into service during construction with the Owner's permission, submit the documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after the Date of Substantial Completion, prior to the final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond the Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty or bond period.

1.11 PROJECT RECORD DOCUMENTS

- A. Maintain on the site one set of the following record documents; record actual revisions of the Work for all trades:
 - 1. Construction drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed Shop Drawings, Product Data, and Samples.
 - 6. Manufacturer's instructions for assembly, installation, and adjusting.
- B. Ensure the entries are complete and accurate, enabling future reference by the Owner.
- C. Store the record documents separate from the documents used for construction.

- D. Record information concurrent with the construction progress, not less than weekly.
- E. Specifications: Legibly mark and record at each product Section description of the actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.
- F. Construction Record Drawings and Shop Drawings: Legibly mark each item to record the actual construction including:
 - 1. Measured depths of foundations in relation to the first floor datum.
 - 2. Measured horizontal and vertical locations of the underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in the construction.
 - 4. Field changes of dimension and detail.
 - 5. Details not on the original contract construction drawings.
- G. Legibly marked Specifications, and legibly marked Record Construction Drawings and Shop Drawings shall constitute the Project Record Documents.
- H. Update the on-site Project Record Documents on a regular basis. Monthly payments will not be processed if Project Record Documents are not maintained up to date.
- I. At completion of the Work of the Contract, the Owner will furnish the Design/Builder with an electronic copy of the construction drawings in AutoCad format, and the Project Manual content in Adobe Acrobat PDF format.
- J. Transfer the information from the Project Record Documents onto the electronic documents (Drawings in AutoCad and Project Manual in Adobe Acrobat PDF format copied onto a CD or DVD ROM disc). These documents will constitute the As-Built Documents.
Deliver the As-Built Documents to the Owner on two copies of disc and paper. The two paper copies are to be bound and printed full size.
Also deliver the paper Project Record Documents to the Owner.
- K. The Owner will review the As-Built Documents and compare them with the Project Record Documents for accuracy, and if necessary return them to the Design/Builder for final correction.
At the time of final submission of the As-Built documents, submit the final Application for Payment.
- L. No review or receipt of record of As-Built Documents by the Owner shall be interpreted as a waiver of any deviation from the Contract Documents or Shop Drawings , or in any way relieve the Design/Builder from responsibility to perform the Work in accordance with the Contract Documents and the Shop Drawings to the extent they are in accordance with the Contract Documents
- M. Abatement Invoices: Application for Final Payment must be accompanied with shipping documents for disposal of the abated material as specified in Section 02 81 13.
- N. At completion of the Work of the Contract submit to the Owner a summary of waste materials, recycled, salvaged and disposed of as outlined in Section 01 74 19.

The Summary shall contain the following information:

For each material salvaged and recycled from the Project, include the amount (in cubic yards or tons or in the case of salvaged items state quantities by number, type and size of items) and the destination (i.e. recycling facility, used building materials yard). For each material land filled or incinerated from the Project, include the amount (in cubic yards or tons) of material and the identity of the landfill, incinerator or transfer station.

- O. At completion of the Work of the Contract submit to the Owner (as outlined in Section 01 74 19) delivery receipts for waste materials salvaged and sent to permitted waste materials processors or recyclers that indicate the location and name of firm accepting recyclable waste materials, types of materials, net weights of each type, date of delivery and value of materials.
- P. At completion of the Work of the Contract submit to the Owner a table indicating information pertaining to construction materials used on the project that includes the following:
 - Name of the material
 - Amount of low emissive VOC
 - Percentage of pre-consumer recycled content
 - Percentage of post consumer recycled content
 - Distance product was manufactured from construction site (Greater or less than 500 miles)

Also submit written documentation substantiating the information in the form of a manufacturer's cut sheet, material safety data sheet or letter from the manufacturer.

1.12 PROJECT CLOSE OUT INSPECTIONS - PUNCH LIST

- A. When the work has reached such a point of completion that the building or buildings, equipment, apparatus or phase of construction or any part thereof required by the Owner for occupancy or use can be so occupied and used for the purpose intended, the Design/Builder, prior to notification to the Owner, shall make a preliminary inspection of the Work to insure that all requirements of the Contract have been met and the Work is substantially complete and is acceptable. Upon such notification, the Owner shall make detailed inspection of the Work to insure that all requirements of the Contract have been met and the Work is complete and is acceptable.
- B. Within ten (10) calendar days of notification, the Owner will perform the inspection and a copy of the report of the inspection shall be furnished to the Design/Builder so that the Design/Builder may proceed without delay with any part of the Work found to be incomplete or defective. The Design/Builder shall complete the items listed within thirty (30) calendar days and notify the Owner.
- C. When the items appearing on the report of inspection have been completed or corrected, the Design/Builder shall so advise the Owner. After receipt of this notification, the Owner shall reinspect and inform the Design/Builder of any remaining items.

A copy of the report of the final inspection containing all remaining contract exceptions, omissions and incompletions shall be furnished to the Design/Builder within seven (7) calendar days of notification.

- D. The Design/Builder shall within fourteen (14) calendar days complete the items listed on the inspection report and provide notification of completion and all remaining contract exception,

omissions and incompletions from the Design/Builder, the Owner will reinspect the Work to verify completion of the exception items appearing on the report of final inspection.

Upon completion of reinspections, the Owner will prepare a certificate of final acceptance or will furnish to the Design/Builder a copy of the report of the Owner's reinspection detailing Work that is incomplete or obligations that have been fulfilled but are required for final acceptance.

The Design/Builder shall compensate the Owner for services performed on Punch List inspections beyond the original inspection and two reinspections of the same area through a credit change order reducing the total contract amount.

- E. Upon Substantial Completion of the Work, the Design/Builder will be paid all retainage, less one hundred fifty percent (150%) of the value attributable to "punch list" work. As items on the punch list are completed, the Design/Builder will be paid one hundred fifty percent (150%) of their value at the next progress payment.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01 81 10

ENVIRONMENTAL IMPACT OF MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to this section.

1.2 WORK INCLUDED:

- A. Objectives: To obtain acceptable Indoor Air Quality (IAQ) for the completed project and minimize the environmental impacts of the construction and operation, the Design/Builder during the construction phase of this project shall implement the following procedures singly or in combination:
 - 1. Select products that minimize consumption of non-renewable resources, consume reduced amounts of energy and minimize amounts of pollution to produce, and employ recycled and/or recyclable materials. Obtain Owner's approval of all materials listed in Part 2 prior to placing the order with the manufacturer of the material.
 - 2. Maintain a materials log book and verification that materials used have been reviewed for environmental considerations as outlined in this section.
 - 3. Control sources of potential IAQ pollutants by controlled selection of materials and processes used in project construction in order to attain acceptable IAQ as defined in this section.
- B. Products and processes that achieve the above objectives to the extent currently possible and practical have been selected and shown in the Contract Documents. The Design/Builder is responsible to maintain and support these objectives in developing means and methods for performing the work of this Contract and in proposing product substitutions and/or changes to specified processes.

1.3 RELATED WORK:

- A. Division 1 sections: "Indoor Air Quality Requirements", and "Waste Materials Management and Recycling".

1.4 SUBMITTALS:

- A. Submit the following in accordance with Conditions of the Contract and Division 1 specification sections.
 - 1. Submit as part of the Division 1 Project Closeout documents indicating for each material the VOC content, the recycled content, and the Manufacturer's Safety Data Sheet (MSDS).

1.5 QUALITY ASSURANCE:

- A. As part of the Preconstruction Meeting specified in Division 1 discuss the IAQ and environmental impact compliances required by this Contract. The purpose of this agenda item is to develop a

mutual understanding of the IAQ and environmental impact program requirements, and coordination of the Design/Builder's management of the program with the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS:

- A. General: The following special IAQ and environmental impact requirements apply to materials specified in their respective technical specification sections of this Project Manual. See Tables 2.1 and 2.2 for definitions of low VOC content and recycled content.

The following list are qualities requested to be attained to the best ability of the Design/Builder for each of the described materials in the pursuit to achieve a more environmentally compatible building.

- B. Division 02 - Sitework:
1. Aggregate Base Course: Aggregate base course for on-site paved areas shall maximize use of recycled ABC.
 2. Asphaltic Concrete Paving: Asphalt paving shall maximize use of recycled asphalt paving.
 3. Portland Cement Concrete Paving: Per Federal Acquisition Regulations (FAR) requirements, there will be a minimum of 20% fly ash content in cement.
- C. Division 03 - Concrete:
1. Cast-in-Place Concrete:
 - a. Per FAR, cement must include 20% fly ash.
 - b. Reinforcing steel shall maximize recycled scrap steel content.
 - c. Form release agents shall be low VOC content.
 - d. Liquid membrane-forming curing and sealing compound shall be low VOC content.
- D. Division 04 - Masonry:
1. Concrete Unit Masonry:
 - a. Concrete Unit Masonry shall maximize the use of recycled materials.
 - b. Reinforcing bars shall maximize the use of recycled steel.
- E. Division 05 - Metals:
1. Structural Steel: Framing steel shall maximize the use of recycled steel.
- F. Division 06 - Wood and Plastics: Wood products:
1. Each specified solid and veneer wood species must originate from a sustainably managed forest certified by a Forest Stewardship Council (FSC) accredited certification group such as Smartwood or Scientific Certification Systems (SCS).
 2. Fiberboard used as blocking, millwork, casework substrate, underlay and door cores must be urea-formaldehyde free, and not exceed ANSI A208.1-1993 emission standard of 0.20 ppm of formaldehyde.
 3. Structural fiberboard (OSB, MDF, and particleboard) shall maximize post-consumer waste material.
 4. Plastic laminates will be installed with water-based, formaldehyde free, low VOC (volatile organic compound) adhesives.

5. Millwork and casework adhesives will be water-based, formaldehyde free, low VOC adhesives.
 6. Transparent wood finish systems shall utilize only waterborne acrylic sealers and finish coats.
- G. Division 07 - Thermal and Moisture Protection:
1. Building Insulation:
 - a. Insulation materials manufactured using chlorofluorocarbons (CFCs) shall not be used. (CFCs have been completely phased out of U. S. manufactured insulation products.)
 - b. Extruded polystyrene insulation shall not be manufactured with chlorofluorocarbon (CFC) blowing agent and shall maximize recycled content.
 - c. Fiberglass batt insulation, fiberglass board insulation, and mineral wool insulation shall maximize use of recycled material.
 - d. Mineral wool fire safing insulation shall maximize recycled material.
 2. Single-Ply Membrane Roofing: Rigid insulation manufactured with chlorofluorocarbon (CFC) blowing agents shall not be used.
 3. Joint Sealants:
 - a. Interior sealants shall not contain: mercury, butyl rubber, neoprene, SBR (styrene butadiene rubber), or nitrile.
 - b. Silicone sealants shall be low VOC content.
 - c. Polyurethane sealants containing mercury shall not be used.
 - d. Compressible foam joint fillers, polyester polyurethane foam impregnated with neoprene rubber or acrylic ester styrene copolymer used in this facility shall not be manufactured with CFC blowing agents.
 - e. Sealants formulated with aromatic solvents (organic solvent with a benzene ring in its molecular structure) fibrous talc or asbestos, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium, or their components shall not be used.
- H. Division 08 - Doors and Windows:
1. Flush Wood Doors: Fiberboard used as door cores shall meet the requirements of ANSI A208.1-1993 for particleboard, including the requirement to meet a threshold of less than 0.30 ppm of formaldehyde using test method ASTM 1333.
 2. Glass and Glazing:
 - a. Sealants and glazing compounds shall be low VOC content.
 - b. Sealants and glazing compounds formulated with aromatic solvents (organic solvent with a benzene ring in its molecular structure), fibrous talc or asbestos, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium, or their components will not be used.
- I. Division 09 - Finishes:
1. Portland Cement Plaster:
 - a. Plaster including additives such as epoxy or other resins shall be low VOC content.
 - b. Steel lath shall maximize recycled steel.
 2. Gypsum Drywall:
 - a. Gypsum board must contain recycled or synthetic gypsum. Facing paper shall be manufactured from recycled newsprint including post-consumer waste.
 - b. Glass fiber sound attenuation blanket insulation shall maximize recycled material.
 - c. Joint compound shall be low VOC content.

- d. Multi-layer gypsum board applications shall be screw attached and not laminated with adhesives.
- e. Provide for thorough cleaning and removal of all silica/gypsum dust upon completion of gypsum drywall installations, including, but not necessarily limited to, all components in plenum spaces, including tops of pipes and sills, and insides and outsides of ducts.
- f. Only paper joint tape (no fiberglass tape) will be used.
- g. Mineral fiber sound attenuation blankets shall maximize recovered material.
- h. Steel studs, runners, and channels for framing shall maximize recycled steel content.
- 4. Acoustic Panel Ceilings:
 - a. Ceiling panels shall maximize use of recycled material, and be finished with water-based low VOC paint.
 - b. Suspension systems shall maximize recycled material.
- 5. Resilient Tile Flooring:
 - a. Rubber floor tiles shall maximize recycled materials.
 - b. Adhesives shall be low VOC content.
- 6. Carpet/Carpet Tile:
 - a. Carpet shall be one that is accepted in an operating recycling program which extracts component materials for reuse and/or reclaims inherent energy, and does not contribute significantly to land fill.
 - b. If an adhesive is required for installation, use low VOC carpet manufacturer recommended adhesive and install per manufacturer's recommended frame or perimeter adhesive pattern method. (Full field glue-down is not acceptable except for carpet with an integral dry film adhesive back.)
 - c. If a seam sealer is required for installation, use carpet manufacturer recommended low VOC seam sealer or recommend heat welded seaming.
- 7. Paint and Polychromatic Finish Coating:
 - a. Do not use water based paints formulated with aromatic hydrocarbons (organic solvent with a benzene ring in its molecular structure), formaldehyde, halogenated solvents, mercury or mercury compounds, or tinted with pigments of lead, cadmium, chromium VI and their oxides. Water based paints shall be low VOC and shall have a flash point of 61 degrees C or greater.
 - b. Where it is necessary to use solvent-based paints, they shall be formulated for low VOC emissions and shall not be formulated with formaldehyde, halogenated solvents, mercury or mercury compounds, or tinted with pigments of lead, cadmium, chromium VI and their oxides, nor formulated with more than 10% aromatic hydrocarbons by weight.
 - c. The following shall be low VOC and not be formulated with aromatic hydrocarbons (organic solvent with a benzene ring in its molecular structure) formaldehyde, halogenated solvents, mercury or mercury compounds, or tinted with pigments of lead, cadmium, chromium VI and their oxides.
 - High performance water based acrylic coatings.
 - Pigmented acrylic sealers.
 - Catalyzed epoxy coatings.
 - High performance silicone grafted epoxy coatings.
- J. Division 12 - Furnishings:
 - 1. Casework: Silicone sealant shall be water-based silicone sealant with low VOC content.

- K. Division 23 - Mechanical:
1. Basic Mechanical Materials and Methods: Use low VOC joint sealers.
 2. Basic Piping Materials and Methods: Use solder that does not contain lead.
 3. Underground Utilities - Basic Piping Materials and Methods: Use solder that does not contain lead.
 4. Pipes and Pipe Fittings: Use solder that does not contain lead.
 5. Mechanical Insulation: Mechanical sound insulation materials within the duct shall include a impervious, non-porous coating that prevents dust from accumulating in the insulating materials.
 6. Plumbing Fixtures: Plumbing fixtures must meet water conservation requirements of the Energy Policy Act.
 7. Metal Ductwork: Use low VOC joint and seam sealants.

Table 2.1 Definition of Low VOC Content Levels

<u>Material or Product</u>	<u>Low VOC Content Level</u>
Form Release Agents	350 g/L VOC content
Plastic Laminate Adhesive	20 g/L VOC content
Casework and Millwork Adhesives	20 g/L VOC content
Transparent Wood Finish Systems	350 g/L VOC content
Water based Joint Sealants	50 g/L VOC content
Non-water based Joint Sealants	350 g/L VOC content
Portland Cement Plaster	20 g/L VOC content
Gypsum Drywall Joint Compound	20 g/L VOC content
Terrazzo Sealer	250 g/L VOC content
Acoustic Panel Ceiling Finish	50 g/L VOC content
Resilient Tile Flooring Adhesive	100 g/L VOC content
Vinyl Flooring Adhesives	100 g/L VOC content
Carpet Adhesive	50 g/L VOC content
Carpet Seam Sealer	50 g/L VOC content
Water-based Paint & Polychromatic finish coatings	150 g/L VOC content
Solvent -based Paint	380 g/L VOC content
High Performance Water-Based Acrylic coatings	250 g/L VOC content
Pigmented Acrylic Sealers	250 g/L VOC content
Catalyzed Epoxy coatings	250 g/L VOC content
High Performance Silicone	250 g/L VOC content
Casework Sealant	50 g/L VOC content
Liquid membrane-forming curing & sealing compound	350 g/L VOC content

Table 2.2 Required Minimum Recycled Content of Materials

<u>Material or Product</u>	<u>Recommended Recycle Content</u>
Asphaltic Concrete Paving	25% by weight
Reinforcing Steel in Concrete	60% recycled scrap steel 1
Reinforcing Bars in Precast Concrete	60% recycled steel 1
Concrete Unit Masonry	50% recycled content
Reinforcing Bars in Concrete Unit Masonry	60% recycled steel 1
Framing steel	30% recycled steel 1
Fiberglass batt insulation	20% recycled glass cullet ²
Fiberglass board insulation	20% recycled glass cullet ²
Mineral wool insulation	75% recycled material (slag) ²
Mineral wool fire safing insulation	75% recycled material by weight (slag) ²
Gypsum board	10% recycled or synthetic gypsum
Facing paper of Gypsum Board	100% recycled newsprint including post consumer waste ²
Mineral Fiber Sound Attenuation Blankets	75% recovered material by weight (slag) ²
Steel studs, runners, and channels	60% recycled steel 1
Acoustic Panel Ceilings	60% recycled material by weight
Ceiling Suspension Systems	60% recycled material 1
Rubber floor tiles	90-100% recycled materials ²
Structural fiberboard	80-100% recycled content ²

Notes for Table 2.2:

1. 60% represents the average recycled content for the U. S. steel industry. Use of U. S. manufactured steel will meet this requirement.
2. As per EPA Comprehensive Guideline for Procurement of Products Containing Recovered Materials (60 FR 21370, effective May 1, 1996).

PART 3 - EXECUTION

3.1 GENERAL:

- A. Submit to the Owner for review and approval product data such as MSDS and environmental impact data prior to ordering project materials.
- B. Prepare and maintain a Materials Log, providing information on content of materials, where specific materials are to be used, MSDS, and environmental specifications of the material. Maintain the log book weekly as materials are ordered.

3.2 FIELD QUALITY CONTROL:

- A. The Owner reserves the right to take samples and perform, at random, tests of approved materials delivered to the job site to verify compliance of actual materials with specifications.

END OF SECTION

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SECTION 01 81 22

INDOOR AIR QUALITY REQUIREMENTS

PART 1- GENERAL

1.01 SUMMARY

- A. IAQ Management during Construction
 - 1. Develop and implement an Indoor Air Quality (IAQ) Management Plan for the construction and pre-occupancy phases of the building as follows:
 - a. During construction meet or exceed the recommended Control Measures of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, latest edition, Chapter 3.
 - b. Protect stored on-site or installed absorptive materials from moisture damage.
 - c. Replace all filtration media immediately prior to occupancy with MERV 8 filters or higher.

1.02 OVERVIEW

- A. The intent of this IAQ Plan is to:
 - 1. Minimize exposure of construction workers to air pollutants;
 - 2. Prevent air pollutants from collecting in building systems and on building materials; and
 - 3. Prevent air pollutants caused by construction from migrating into occupied spaces.
- B. For the purposes of this plan, air pollutants are defined as: Particulates, Volatile organic compounds, Formaldehyde, Combustion emissions, Airborne bacteria and micro-organisms and Airborne inorganic compounds, such as ozone (from electric motors), metal fumes (from smoldering and welding), and ammonia and chlorine (from cleaning products).

PART 2- PRODUCTS

Not used

PART 3-EXECUTION

3.01 HVAC EQUIPMENT AND DUCT WORK

- A. HVAC equipment and ductwork will be protected from dust and other pollutants via the following procedures:
 - 1. Sealing Ductwork and Air Handling Equipment
 - a. Openings into installed or existing ductwork and air-handling equipment not in active use will be sealed using taped plastic, taped cardboard, or other reasonably air-tight coverings. Sealing will occur prior to, or immediately upon installation of the new ductwork or equipment. Regular walk-throughs will be conducted by the Design/Builder to check for damaged or displaced coverings. Repair or replacement of damaged or displaced coverings will occur immediately upon discovery, at the direction of the Design/Builder.
 - b. Construction work that generates air pollution will be avoided where ductwork or

- air handling equipment is being installed. If visible air pollutants are present in a space where ductwork is to be installed, spot cleaning or other measures will be used to prevent ductwork or equipment contamination.
2. Use of Mechanical Systems during Construction
 - a. Exhaust and makeup air supply systems:
When a system is operated during construction, its filters will be replaced upon completion of construction with MERV 13 filters.
 - b. Air handling systems will be subject to these provisions when operated during construction:
 1. The AHU will be protected with a temporary filter having a minimum rating of MERV 8, per ASHRAE 52.2.
 2. Distribution elements needing filters, including all return air ductwork, will be protected with temporary filters having a minimum rating of MERV 8 per ASHRAE 52.2 unless otherwise noted below.
 - c. All components of the distribution on the return side will be protected, including but not limited to:
 1. The portion of the air handler upstream of the central fan;
 2. Return vents, ducts and shafts;
 3. VAV box intakes; and
 4. Transfer ducts.
 - d. Components of the distribution system on the supply side will typically not need protection except if portions of the supply system become contaminated, coarse filters will be applied to completely cover supply outlets, to prevent the distribution of particulates into building spaces.
 3. Filter Replacement and Tracking
 - a. MERV 8 filters used for ductwork protection will be replaced on an as-needed basis, as determined by the Design/Builder.
 - b. Upon completion, the MERV 8 filters used for ductwork protection will be discarded. New filters will be installed at all air handlers.

3.02 TEMPORARY LOCAL EXHAUST

- A. Where available, operable vents and windows will be opened to ventilate the building during application of interior finishes when weather conditions are suitable. Spaces with fixed glazing or no windows will be ventilated by localized temporary exhaust, as described below, or by using building mechanical systems (described above).
 1. Local temporary exhaust will be accomplished using fans, duct extensions, and filters.
 2. Local temporary exhaust will not discharge near air intakes or other openings that lead into the building.

3.03 COVERING OR SEALING SOURCES OF POLLUTION

- A. The following are rules that apply to materials that emit air pollution or odors:
 1. Containers containing wet materials will be covered whenever they are not in active use.
 2. Waste materials will be covered or sealed and regularly removed from the building.
 3. Absorptive materials or materials with an odor will be covered while moved through the building.
 4. Whenever possible, material containers will be disposed of with the covers on.
 5. Materials that require a surface coating to control pollutants or odors will be coated promptly.

3.04 CONTROLLING POLLUTION AT ENTRANCES

- A. Measures will be taken to prevent pollutants from being tracked into interior spaces by workers or equipment. These will include temporary walk-off mats and floor protection.

3.05 PROTECTION OF STORED MATERIALS

- A. Measures will be taken to minimize dust accumulation on material surfaces and the absorption of other pollutants by absorbent materials. The measures will include the following:
 - 1. Materials will be handled and stored according to the manufacturer's recommendations.
 - 2. Unwrapped absorbent materials will be shrink-wrapped if necessary.
 - 3. Highly absorbent materials like duct liner, acoustic tile, carpeting, or insulation will be stored indoors in the original packaging, or covered and sealed.
 - 4. Moderately porous materials like gypsum board will be stored indoors, wrapped or away from dust and materials prone to off-gas VOC's.
 - 5. Framing lumber will be stored indoors whenever possible. If stored outdoors, the lumber will be covered with a water proof covering, stored off the ground, and located away from standing water.
 - 6. Dense material like glass, metal framing, ductwork and equipment will be covered and kept dry.
 - 7. If condensation forms on cold material, care will be taken not to expose it to dust or other particles. If exposed to pollution, housekeeping measures will be used promptly to clean the material before installation.

3.06 PREVENTING CONTAMINATION OF COMPLETED AREAS FROM WORK UNDER CONSTRUCTION

- A. When work is completed in an area, the area will be protected from pollutants generated in other parts of the building still under construction. One or more of the following methods of pathway interruption will be used:
 - 1. Erecting barriers between completed areas and areas still under construction
 - 2. Where present, doors and windows will be closed and locked between completed portions of the building and portions of the building still under construction.

3.07 HOUSEKEEPING

- A. The following housekeeping measures will be employed throughout construction:
 - 1. A regular housekeeping schedule will be instituted. Cleaning measures and frequency will be selected according to the pollutants generated in a space.
 - 2. Low-odor cleaning agents will be used.
 - 3. Spills of water or solvent will be cleaned up immediately.
 - 4. Attention will be given to cleaning hidden or hard-to-reach surfaces, such as wall cavities, tops of door, ledges, and behind water closets.

3.08 SCHEDULING

- A. Construction activities shall be scheduled such that construction and occupancy do not overlap in time. Provide adequate time for carpet, paint and other finishes time to off-gas prior to occupancy.

END OF SECTION

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SECTION 02 82 13

ASBESTOS MATERIAL REMEDIATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Abatement procedures.
- B. Abatement plan.

1.2 RELATED SECTIONS

- A. Section 02 41 19 - Selective Demolition.

1.3 ABATEMENT PROCEDURES

- A. The Owner has determined there is asbestos containing material to be encountered in the Work of this Project.
- B. Contractor's authorization to contract for the specified abatement work is enabled by an abatement plan prepared by Emery Environmental Associates.
The plan is being submitted by the Owner to be reviewed by the Rhode Island Department of Health, for performance of the Work described in the plan.
The asbestos testing report and abatement plan is not included with these proposal documents but is forthcoming in an Addendum.
- C. Obtain the services of a State Certified Abatement Contractor to remove and dispose of the asbestos containing material in accordance with the approved plan and with requirements of the Rhode Island Department of Health, Division of Occupational & Radiological Health.
- D. Retain abatement invoices for submittal with required closeout record documents. Invoices must be accompanied by complete shipping documents showing final disposal location.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.01 EXECUTION

- A. Perform the Work in accordance with the approved abatement plan.

END OF SECTION

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SECTION 03 01 30

FLOOR PATCH AND SKIMCOAT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provision and installation of floor patch and skimcoat in all areas where necessary under new flooring, at damaged existing flooring and at demolished existing partitions to create a level subfloor in accordance with these specifications.

1.02 PERFORMANCE REQUIREMENTS

- A. ASTM C-109 - Compressive strength = more than 4000 PSI after 28 days.
- B. VOC: 0 g/L, calculated SCAQMD 1168

1.03 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.
- B. Shop Drawings: Plans indicating substrates, and locations.

1.04 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum 5 years of experience.
- B. Installer: Company specializing in performing the work of this section with minimum five years documented experience.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.

1.06 SAFETY PRECAUTIONS

- A. Follow all safety precautions by the manufacturer and required all Federal, State and Local Codes.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Do not install material in interior air temperature below 50 degrees. This temperature must be maintained two days prior and two days after installation.
- B. Comply with manufacturer's written instructions for substrate temperature, ambient temperature and humidity, ventilation, and other conditions affecting underlayment performance.

1.08 COORDINATION

- A. Verify that the floor patch and skimcoat material specified in this section is compatible with the existing substrate it is covering and the floor finish that will be installed to its surface.
- B. If any inconsistencies exist, inform the Owner prior to installation.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Ardex Engineered Cements
ARDEX GPS™ General Patch & Skimcoat
- B. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS

- A. The material is a trowelable patch and skim coat for use over interior concrete and wood subfloors.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify the existing substrate is in satisfactory condition and properly cleaned to meet the manufacturer's recommendations.

3.02 INSTALLATION

- A. Install the floor patch and skimcoat material in accordance with the manufacturer's requirements, instructions and recommendations.
- B. Cure according to manufacturer's written instructions. Prevent contamination during application and curing processes.
- C. Do not install floor coverings over floor patch and skimcoat material until after time period recommended in writing by manufacturer.
- D. Remove and replace areas of floor patch and skimcoat material that show evidence of lack of bond with substrate, including areas that emit a "hollow" sound when tapped.
- E. Install under all areas receiving new vinyl tile, sheet vinyl and carpet flooring as required to provide a level subfloor meeting the minimum requirements of the flooring manufacturer.

3.03 CLEANING

- A. Clean work under provisions of Section 01 70 00.

END OF SECTION

SECTION 03 31 00

CONCRETE CONSTRUCTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Description for the complete installation of standard concrete construction.

1.02 REFERENCES

- A. ASTM C150 - Specification for Portland Cement
- B. ASTM C33 - Specification for concrete aggregates
- C. ASTM A-15 - Standard metal reinforcement
- D. ASTM A-305 - Minimum requirements for the deformation of deformed steel bars for concrete reinforcement
- E. ASTM A-185 - Standard specifications for welded steel wire fabric for concrete reinforcement.
- F. ASTM C-192 - Method of making and curing concrete compression and flexure test specimens in the laboratory.
- G. ASTM C-31 - Method of making and curing concrete compression and flexure test specimens in the field.
- H. ASTM C-39 - Test for compressive strength of cylindrical strength of cylindrical concrete specimens.
- I. ASTM C-143 - Test for slump of Portland Cement Concrete
- J. ASTM C-42 - Method of obtaining and testing drilled cores and sawed beams of concrete
- K. ASTM C-94 - Standard Specifications for Ready-Mix concrete.

1.03 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Test reports shall be submitted for approval and the results distributed as follows: Copy to field office, 1 copy to Design/Builder's office and 4 copies to Owner's office
- C. Shop drawings shall indicate dimensions, bar schedules, bending details and placing diagrams and details for all reinforcement.

- D. Design data shall be reviewed by the Owner 30 days prior to commencing any concrete operations.
- E. Record documents regarding concrete pours shall be kept by the Design/Builder and submitted to the Owner, upon request including the following data: date of pour, starting time, mean temperature, total yardage pour location, time of finish and curing duration.

1.04 QUALITY ASSURANCE

- A. Concrete Quality: When there is any question as to the quality of the concrete of the structure, the Owner may require the Design/Builder, at the Design/Builder's expense, to have tests made in an approved independent testing and inspection laboratory. Such tests shall be in accordance with ASTM C-42 or Section 201 and 202 of the current A.C.I. Building code for Reinforced Concrete (A.C.I. 318) as may be required. The criteria for acceptability of the concrete under the latter shall be that given therein. If tested concrete is below contract requirements, the Owner may condemn such concrete already installed. Remove such condemned concrete and replace with new concrete that meets the proper criteria.

1.05 QUALIFICATIONS

- A. All companies involved in performing the work of this section shall have documented experience specializing in such work for a minimum of five years.

1.06 REGULATORY REQUIREMENTS

- A. All concrete construction shall meet state and local code requirements.

1.07 MEASUREMENT OF MATERIALS

- A. Measurement shall be by weight by weighing devices accurate within 1% except that water may be measured by either weight or volume and the water measuring device shall be controllable to one-half of one percent.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Cement: Cement shall be Portland cement Type I, conforming to ASTM Specification C-150. Type III High Early Cement shall be used between December 1st and April 1st.
- B. Only one brand of cement shall be used for all structural concrete to be left exposed, so that even coloring is assured for all such surfaces.
- C. Fine Aggregate: Sand for concrete work shall conform to ASTM Specification C-33, and shall be composed of clean, hard, durable, uncoated grains free from silt, loam and clay.
- D. Coarse Aggregate: Coarse aggregate shall be gravel or crushed stone conforming to ASTM Specification C-33 and shall be composed of clean, hard, durable, uncoated grains of strong material. Maximum size of aggregate shall be 1 inch.

- E. Water: Water used in mixing concrete shall be clean and free from injurious amounts of oils, acids, alkalis, organic materials, or other deleterious substances.
- F. Metal Reinforcement: Reinforcing bars shall conform to (ASTM Designation: A 615/A 615M, Grade 60, deformed.
- G. Wire Fabric: Welded wire fabric for concrete reinforcement shall conform to ASTM Designation A-185.
- H. Metal Accessories: Include all spacers, chairs, ties and other devices necessary for properly placing, spacing, supporting and fastening reinforcement in place.
- I. Floor Hardener: Floor Hardener in all areas where floor finish is exposed concrete, not otherwise covered or given floor coating shall be Lapidolith as manufactured by L. Sonneborn Sons, Inc., Flintox Liquid manufactured by Toch Bros., Inc., Hornolith manufactured by A.C. Horn Products of Dewey and Almy Chemical Division, W.R. Grace & Co., or Agatex manufactured by Devco-Truscon. Number of coats and application procedure shall be in strict accordance with applicable manufacturers specification.
- J. Inserts: Inserts shall be either adjustable, threaded or wedge types depending on use as manufactured by Hohmann & Barnard, Inc., 205 East 53rd Street, New York, New York.
- K. Admixtures: The use of any admixtures other than those which may be specified, shall be used only when and as approved in writing by the Owner. Anti-freeze admixtures shall not be used. All exposed concrete shall have Pozzo-lith additive and Dorex air entraining additive.
- L. Aggregate for Exterior Ramps and Stairs: Concrete finish shall be made non-slip by using Coarse (C.F.) Alundum Aggregate (40 lbs. per 100 sq. ft.), as manufactured by the Norton Co., Worcester, Mass.
- M. Curing Material: Demicon with fugitive dye or approved equal as manufactured by McMillan Products Co., applied in accordance with manufacturer's instructions. Kraft paper for protection shall be similar to SE-30 as manufactured by American Sisalkraft Corp., properly lapped and secure in place.

2.02 MIXES

- A. Concrete details, plain or reinforced to conform to the current provisions of the A.C.I. Code. Design and strength of concrete 3000 lbs. per sq. inch at 28 days; minimum cement content 6 bags per cu. yd. of concrete and not more than 6-1/2 gallons of water per bag of cement shall be used to maintain proper strength, workability and consistency. Maximum slump shall be 5" however, exposed concrete shall have a maximum slump of 4" plus or minus 2".
- B. Design of Mixes: The testing laboratory, approved by the Owner shall prepare the designs of mixes for the strength of concrete specified to be used. For trial mixes, use identical proportions of cement and aggregate that will be used for job mix. Tests shall be in accordance with ASTM C-

192 and C-39. Laboratory trial mix shall develop concrete comprehensive strength 15% higher than required minimum. Prepare mix design for each type of cement.

2.03 MIXING OF CONCRETE:

- A. Equipment: The mixing equipment shall be capable of combining the aggregates, cement and water within the specified time into a thoroughly mixed and uniform mass and of discharging the mixture without separation.
- B. Truck Mixing: Truck mixers shall be of the revolving drum type, watertight, and so constructed that the concrete can be mixed to insure a uniform distribution of materials. All solid materials for the concrete shall be accurately measured in accordance with section on measuring and charged into the drum at the proportioning plant. The truck mixer shall be equipped with a tank for carrying water, and the tank equipped with a device by which the quantity of water added can be readily verified. Only the predetermined amount of water shall be added to the dry mixture at the site. Truck mixing shall be continued for not less than fifty revolutions after all ingredients, including the water, are in the drum and shall not continue for more than ten minutes before being used.
- C. Ready-mixed concrete shall be mixed and delivered in accordance with ASTM Designation C-94.
- D. Hand Mixing: When hand mixing is authorized, it shall be done on a watertight platform and in such a manner as to insure a uniform distribution of the materials throughout the mass. Mixing shall be continued until a homogeneous mixture of the required consistency is obtained.
- E. Retempering: The retempering of concrete or mortar which has partially hardened will not be permitted.

2.04 QUALITY CONTROL

- A. Concrete Tests: Tests of concrete shall be made by the testing laboratory. Not less than one test, or as may be directed by the Owner, for each 100 cu. yd. of concrete for each strength of concrete placed will be required with a minimum of one test for each day's pour. Not less than four specimens will be made and stored by the Design/Builder for each test. All specimen shall be cured and tested by the Laboratory. Specimen shall be made and tested in accordance with current ASTM Specifications C-39 and C-31. Slump tests shall be made on each batch tested in accordance with current ASTM Specification C-143.
- B. Each test shall consist of four specimens of which one cylinder shall be tested after 7 days; two cylinders shall be tested after 28 days; fourth cylinder shall be tested at 45 days only when 28 day tests are below specified strength. In all cases where strength of specimen falls below required minimum ultimate compressive strength, the Owner shall have the right to make whatever changes are necessary to secure the required strength.

2.05 CEMENT FINISHES:

- A. Concrete Floor Slab Finishes: Finished floor slab surfaces shall be true plane surfaces with a tolerance of 1/8" in 10' unless otherwise indicated. Surfaces shall be pitched to drains. The dusting of finished surfaces with dry materials will not be permitted.
- B. Monolithic Finish: Floor slabs shall be finished by tamping the concrete with special tools to force the coarse aggregate away from the surface then screeding and floating with straight edges to bring the surface to the required finish level. While the concrete is still green but sufficiently hardened to bear a man's weight without deep imprint, it shall be wood-floated to a true, even plane with no coarse aggregate visible. Sufficient pressure shall be used on the wood float to bring moisture to the surface. After surface moisture has disappeared, surfaces shall be steel-troweled to a smooth, even, impervious finish free from trowel marks.
- C. Wood Float Finish: shall be provided for exterior concrete slabs, ramps, stairs and platforms. The surfaces shall be finished by tamping the concrete to force coarse aggregate away from surface, screeding and floating to bring the surfaces to the required finish level and wood-floated to an even, smooth surface.
- D. Exterior Cement Finish: Tread surfaces of exterior platforms and steps shall have non-slip aggregate incorporated in the finish at the rate of 40 lbs. of abrasive to 100 sq. ft. of surface. Tread surfaces to receive a wood float finish. Keep covered with damp sand for 10 days. Vertical surfaces to be steel troweled smooth.
- E. Steel-Trowel Finish: shall be provided for floor slabs in rooms and spaces to have exposed concrete floor finish and floor slabs that are to receive vinyl tile floor finishes and where thin set quarry tile floors are indicated.
- F. General Finish: (Walls) Where concrete is not exposed to view, except footings, immediately after removing forms cut back all metal form ties. Wet concrete and fill all voids or honeycomb surfaces with 1:2 cement mortar.
- G. Standard Finish: (Walls) Where concrete is exposed to view, immediately after removing forms, remove all joint marks, projections and loose materials, cut back all metal form ties, point up all voids and 1:2 cement mortar, rub entire surface with carborundum to a smooth even surface.

PART 3 - EXECUTION

3.01 FORMS:

- A. Forms shall conform to the shape, lines, grades and dimensions of the concrete as called for on drawings. Forms for exposed surfaces shall be lined with new plywood or masonite. All joints to be filled with suitable form joint filler to produce a smooth surface. The inside of such forms shall be coated with non-staining mineral oil or other approved material before reinforcement is placed. Forms for exposed slabs and walls shall be new of materials specified.
- B. For unexposed surfaces and rough work, undressed lumber may be used. Lumber once used in forms shall have nails withdrawn and surfaces to be in contact thoroughly cleaned before being

used again. Forms shall be sufficiently tight to prevent leakage of mortar. They shall be properly braced or tied together so as to maintain the desired position and shape during and after placing concrete. Where ties cannot be used, adequate shore or truss supports shall be provided. All forms shall be thoroughly wetted before concrete is placed.

- C. Bolts and Rods: shall preferably be used for internal ties and shall be so arranged that when the forms are removed no metal shall be within 1" of any surface.
- D. Temporary Openings: shall be provided at the base of wall and column forms and at other points where necessary to facilitate cleaning and inspection immediately before placing of concrete. Suitable openings shall be provided in these forms for pouring concrete limiting the drop of concrete to a maximum of 6'. Elephant trunks or chutes on a 1 or 2 slope may be used to limit the drop of concrete.
- E. Removal of Forms: The minimum time elapse before stripping forms, when temperature is 70 degrees to 90 degrees shall be as follows:
 - a. Walls and footings - 1 1/2 days.
 - b. Columns and beam sides - 2 days.
 - c. Beam soffits and slabs - 5 days with immediate re-shoring.
 - d. When temperature is at a higher or lower range than indicated above, stripping shall be as directed by the Owner.
- F. All footing shall be poured between plank side forms. Remove only when concrete is determined to have developed ample strength to support superimposed loads. Design/Builder shall be fully responsible for obtaining depth of footing indicated on drawings. If nature of soil permits, forms may be eliminated upon written permission from the Owner.
- G. Install in forms all inserts, anchors, sleeves, hangers, floor clips and similar devices to carry out the intent of the drawings.
- H. Thoroughly clean pitch and repair in an approved manner, all form material before reusing.
- I. Forms for concrete to which cement finish is not applied shall be treated with a coating of oil, paraffin wax or other approved material.
- J. In the removal of forms from surface to be exposed, care shall be taken to avoid damage to arises and faces.

3.02 PLACING OF STEEL REINFORCEMENT:

- A. Metal reinforcement before placing shall be free from loose mill and rust scale and other coatings that destroy or reduce the bond. No concrete shall be placed before the placing and binding of reinforcement has been inspected and approved by the Owner. Metal reinforcement shall not be straightened or re-bent in a manner that will injure the material. All bars shall be bent cold.

- B. Steel reinforcement shall be accurately positioned and secured against displacement by using wire ties and shall be supported by metal supports.
- C. Concrete covering over steel reinforcement shall be the following thicknesses.
 - a. Footings and other principal structural members in which concrete is deposited against the ground, 3" between steel and ground.
 - b. Where concrete surfaces, after removal of forms, are exposed to weather or ground.
 - For bars more than 5/8" in diameter, 2"
 - For bars 5/8" or less in diameter, 1 1/2"

3.03 PLACING OF CONCRETE:

- A. Concrete shall be handled from the mixer and in the case of truck-mixed concrete, from the transporting vehicles to the place of final deposit as rapidly as practicable by methods which shall prevent the separation or loss of the ingredients. Under no circumstances shall concrete that has partly hardened be deposited in the work.
- B. Forms for walls or thin section of considerable height shall be provided with opening or other devices that will permit the placing of concrete without segregation. Concrete, during and immediately after deposit, shall be thoroughly compacted by spading, rodding, or by mechanical vibration.
- C. Concrete shall be deposited continuously or in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause a formation of seams and planes of weakness within the section. If a section cannot be placed continuously, construction joints may be located at points as provided for in the drawings, or approved by the Owner. Do not secure vibrator, to forms or reinforcement, operate in place not less than fifteen (15) seconds and of sufficient duration to produce concrete of uniform and maximum density with even distributing of ingredients and complete embedment of reinforcement. 1-1/2" head vibrators shall be provided for wall and column pours.
- D. Approved external mechanical vibrating equipment applied lightly to exterior studs and walls when such vibration is necessary to secure surfaces that are even, dense, free from aggregate pockets and honeycomb. Vibration shall be carried on continuously with the placing of concrete. Vibration shall not be used in partly set concrete.
- E. No concrete to be placed when temperatures are below 32 degrees F.
- F. Concrete shall not be deposited during rains unless adequately protected, and in any case shall be protected from rain until it has hardened sufficiently to resist the formation of seams and planes of weakness within the section. The top surface shall be generally level.

3.04 CONSTRUCTION JOINTS:

- A. Construction joints shall be located only as herein specified.
 - a. Floor Slab on Ground: Joints shall be as located on plans or a maximum of 20'-0" in all directions. Slabs can be poured in alternate panels, checkerboard fashion.
 - b. Grade Beams and Foundation Walls: Vertical joints shall be placed so that maximum continuous pour does not exceed approximately 80 feet in length. Joints shall be placed at points of minimum shear. Water stops of type specified shall be provided at all construction joints. Care shall be taken to thoroughly work concrete around water stop. Embedment of water stop shall be a minimum of 3" on each side of joint. See drawings for placement. Horizontal construction joints shall not be permitted except as approved in writing by the Owner.
- B. Exposed joints shall be straight and true.
- C. Bulkheads shall be keyed and doweled unless the thickness is less than 4 inches.
- D. At least 2 hours must elapse after depositing concrete in the columns or walls before deposited in beams, girders, or slabs supported thereon. Beams, girders, brackets, column capitals, and haunches shall be considered as part of the floor system and shall be placed monolithically therewith.
- E. Reinforcement shall be continuous through construction joints unless otherwise specified.
- F. Expansion joints shall be located as herein specified. Joint materials shall be full thickness indicated.

3.05 CURING AND PROTECTION:

- A. Protect all concrete work against injury from elements and defacement of any nature during construction operations, which included protection of mechanical rooms with plywood prior and during mechanical installation.
- B. When the temperature is below 30 degrees F., or is likely to fall below 35 degrees F., adequate equipment shall be provided for heating the concrete materials and maintaining the concrete at not less than 50 degrees F. for at least 72 hours for Type I, or for as much time as is necessary to insure proper rate of curing of the concrete. Temperature of the separate materials, including the mixing water, when placed in the mixer, shall not exceed 140 degrees F. When placed in forms, the concrete shall have a temperature between 60 degrees F., and 90 degrees F. The use of salts, chemicals to prevent freezing or accelerating agents shall not be permitted.
- C. Keep exposed surfaces of concrete moist for a period of at least seven (7) days after being placed. Protect all concrete except slabs on ground, placed during hot weather, from rays of sun and air currents, cover with two layers of wet burlap and keep wet for seven (7) days.
- D. Keep concrete, except slabs, as moist as practicable during curing period in temperatures below 40 degrees F.

- E. Curing of slabs shall be done by spraying Demicoin Cure-Hard in accordance with manufacturer's directions.

3.06 FOOTINGS:

- A. Footings under entire wall in areas not excavated shall run down to solid bearing to elevations indicated. Bottom of footing is to be located as required to meet minimum state building code requirements. The earth bottoms shall be undisturbed before concrete is placed. Footings shall not be poured on frost, ice or snow.
- B. Protect footings from the effects of frost, any concrete affected by frost action shall be removed and replaced at Design/Builder's expense. Do not load footings until they are completely set.

3.07 FLOOR SLABS:

- A. Slabs on Grade: concrete base slabs shall be installed over 8 inch bank run gravel fill and shall be reinforced with wire mesh lapped 6". Prior to starting the floor work, verify completion of all piping and any mechanical equipment occurring below the floor level. Electrical conduit, if occurring, shall be installed prior to installation of wire mesh.
- B. Provide depressions in slabs required to receive various floor finishes.
- C. Concrete shall be firmly tamped and the surface of slabs to be screeded and floated true and level, (the mixing water content in the concrete to be kept uniform to avoid slump irregularity in the slab surfaces). Pipe screeds shall be installed in ground or on forms, wet screeds prohibited.
- D. Slab surfaces shall be finished and steel troweled to receive specified finished floor material directly. Floor showing trowel marks, swirls, depressions, etc. will be rejected. All exposed slabs shall not have any deviations exceeding 1/8" in 16'. Finish shall have a hard surface without air pockets or other defects. In the event that finishing workmanship is deemed inadequate by the Owner, the Design/Builder shall modify his methods to improve the resulting finish.
- E. Floor slabs to be poured before interior partitions are erected.
- F. Perimeter Filler: Cleavage joints between vertical concrete or other surfaces and floor slabs on grade shall be 1/2" wide and shall extend the full depth of slab. The joints shall be filled with premoulded expansion joint filler to within 1/2" of top of slab. The top of the joint shall be filled with an approved joint sealer.
- G. INTEGRAL DAMPPROOFING: The Design/Builder shall use in slabs on grade "Anti-Hydro" dampproofing or an approved equal integral dampproofing done in strict accordance with manufacturer's printed instructions.

3.08 EXTERIOR PLATFORMS AND STEPS:

- A. Reinforced Concrete

B. Slope steps 1/8" per width of tread. Pitch all platforms to drain dry.

3.09 ANCHOR BOLTS: The structural steel subcontractor will furnish an approved anchor bolt location plan. The Design/Builder shall set anchor bolts and be responsible for position and height of bolt projection. Modification to steel due to incorrect position of anchor bolts will be borne by the Design/Builder.

3.10 CONCRETE WORK INCIDENTAL TO MECHANICAL AND ELECTRICAL INSTALLATIONS: Design/Builder shall provide foundations, bases, pads, tank pads with hold-down rods, concrete envelopes, etc., for all mechanical and electrical equipment as indicated and required. Foundations shall extend at least 6" above the finished floors and to such required heights so the shafts of machines are of an approved distance above finished floor. Foundations shall be constructed with beveled edges at all corners and finished with a smooth coat of cement-mortar. Necessary anchor bolts to be built into the foundation with proper size sleeves, shall be provided by the Design/Builder. Top surfaces shall be steel-troweled to true planes and shall be level unless otherwise indicated or directed.

3.11 CONCRETE SIDEWALKS:

- A. Sidewalks are to be 4" thick of 4000 psi concrete on an 8 inch thick compacted gravel base course. (Unless thicknesses are noted otherwise)
- B. Provide reinforcing of w.w.f. 6x6 – w4 x w4 with a 2 inch minimum cover.
- C. Surface to have a 1:50 pitch for drainage. Concrete shall be struck off with a wood screed and then floated with a wood float and broom to produce an even, gritty surface.
- D. The surface shall drain so that no water stands on the walks.
- E. Sidewalks shall be cut into equal strips not exceeding 6 feet in length by separation plates 1/8" to 3/16" in thickness for full depth of slab.
- F. Expansion joints of premoulded non-extruding filler 1/4" thick, 3-1/2" high, and its top 1/2" below sidewalk surface. Cover joint surface of P.M.J.F. with sealant equal to Tremco "Tremflex-S/L". Provide expansion joints at not more than 25' apart.
- G. All edges of slabs and all joints shall be edged with a 1/4" radius edging tool.
- H. Sidewalks shall be cured by covering with wetted burlap kept damp for 7 days or other approved method.

3.12 CONCRETE EQUIPMENT PADS:

- A. Pads are to be 1'-4" thick of 4000 psi concrete on a 12 inch thick compacted gravel base course. (Unless thicknesses are noted otherwise)
- B. Provide reinforcing as shown on drawings with a 3 inch minimum cover.
- C. Surface to have a 1:50 pitch for drainage. The surface shall drain so that no water stands on the surface.
- D. Concrete shall be struck off with a wood screed and then floated with a wood float and broom to produce an even, gritty surface.
- E. All exposed corners of slabs shall be edged with a 3/4" chamfer.
- F. Concrete pads shall be cured by covering with wetted burlap kept damp for 7 days or other approved method.

3.11 CONCRETE FLOOR SLAB INFILL:

- A. Following cutting and removing existing concrete floor slab and installation of under-slab utilities provide and install new reinforced concrete infill as follows.
- B. Concrete infill is to be 4" thick of 4000 psi concrete on an 8 inch thick compacted gravel base course. (Unless thicknesses of concrete and base are noted otherwise)
- C. Provide reinforcing of w.w.f. 6x6 – w4 x w4 with a 2 inch minimum cover.
- D. Provide new 15 mil vapor barrier above new gravel base.
- E. Pin new concrete infill to existing concrete floor slab using 5/8" diameter 12 inch long steel rods inserted into existing core-drilled slab minimum of 6 inches. Install maximum of 2 feet o.c. around perimeter of infilled area.
- F. Surface of new concrete infill to match level with existing surrounding concrete slab.
- G. New slab surface is to be finished and steel troweled to match finish of surrounding concrete slab or as required to accept new floor finish.
Floor showing trowel marks, swirls, depressions, etc. will be rejected.
All exposed slabs shall not have any deviations exceeding 1/8" in 10'.
Finish shall have a hard surface without air pockets or other defects.
In the event that finishing workmanship is deemed inadequate by the Owner, the Design/Builder shall modify his methods to improve the resulting finish.

END OF SECTION

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SECTION 03 54 13

SELF-LEVELING UNDERLAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.2 SUMMARY

- A. This Section includes a self-leveling underlayment that consists of a blend of high strength cements and powdered polymers used to level and smooth interior, above-grade concrete, wood, VCT, existing patching and leveling materials and non-water soluble adhesive residue on concrete.
- B. Related Sections include the following:
 - 1. Section 03 30 00 - Cast-In-Place Concrete
 - 2. Division 09 Flooring Sections

1.3 REFERENCES

- A. ASTM C109M, Compressive Strength Air-Cure Only
- B. ASTM C348, Flexural Strength of Hydraulic-Cement Mortars
- C. ASTM F2170, Relative Humidity in Concrete Floor Slabs Using in situ Probes
- D. ASTM F710, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
- E. ASTM D4263, Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method

1.4 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's product data and installation instructions for each material and product used. Include manufacturer's Safety Data Sheets.
- C. Shop Drawings: Plans indicating substrates, locations, and average depths of underlayment based on survey of substrate conditions.
- D. Qualification Data: For Installer

1.5 QUALITY ASSURANCE

- A. Installation of the gypsum cement-based, self-leveling underlayment must be by an applicator using mixing equipment and tools approved by the manufacturer and be a factory-trained applicator.

- B. Manufacturer Experience: Provide products of this section by companies which have successfully specialized in production of this type of work for not less than 5 years. Contact Manufacturer Representative prior to installation.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
- B. Deliver products in original packaging, labeled with product identification, manufacturer, batch number and shelf life.
- C. Store products in a dry area with temperature maintained between 50° and 85°F and protect from direct sunlight.
- D. Handle products in accordance with manufacturer's printed recommendations.

1.7 PROJECT CONDITIONS

- A. Do not install in applications on or below grade or in any areas subject to high moisture conditions. Do not install material below 50°F surface and air temperatures. These temperatures must also be maintained during and for 48 hours after the installation of products included in this section. Install quickly if substrate is warm and follow warm weather instructions available from the ARDEX Technical Service Department.

1.8 COORDINATION

- A. Verify that the self-leveling underlayment specified in this section is compatible with the existing substrate it is covering and the floor finish that will be installed to its surface.
- B. If any inconsistencies exist, inform the architect prior to installation.

1.9 WARRANTY

- A. Provide manufacturer's standard warranty.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements of this Specification Section, provide products listed herein from one of the following:
 - 1. ARDEX Americas
 - 2. Mapei Corporation
 - 3. Maxxon Corporation
- B. Basis of Design: ARDEX Americas
- C. Substitutions: Under provisions of Section 01 60 00.

2.02 GYPSUM CEMENT UNDERLAYMENT

- A. Self-leveling, gypsum-cement-based underlayment

1. Basis of Design:
 - a. Products as listed below manufactured by:
 1. ARDEX LU 100™ Self-Leveling Flooring Underlayment
 2. ARDEX P 51™ Primer
 3. ARDEX P 82 Ultra Prime
 4. ARDEX SD-F Feather Finish Self-Drying, Cement-Based Finishing Underlayment
 2. Performance and Physical Properties: Meet or exceed the following values for material cured at 73° F and 50 percent relative humidity:
 - a. Primer:
 - i. Standard Absorbent Concrete: ARDEX P 51™ Primer diluted 1:1 with water
 - ii. Extremely Absorbent Concrete: May require two applications of ARDEX P 51 to minimize the potential for pinholes forming in the ARDEX LU 100.
 - iii. Wood and Non-Water-Soluble Adhesive Residue on Concrete: ARDEX P 51™ Primer undiluted
 - iv. Other Non-Porous Substrates, such as burnished concrete, terrazzo, VCT, ceramic, quarry and porcelain tiles, epoxy coating systems and concrete treated with silicate compounds: ARDEX P 82™ Ultra Prime
 - b. Application: Barrel Mix or Pump
 - c. Compressive Strength: 5,000 psi (350 kg/cm²) at 28 days, ASTM C109M
 - d. Flexural Strength: 1,000 psi (70 kg/cm²) at 28 days, ASTM C348
 - e. Walkable: 2 – 3 hours
 - f. VOC: 0
- 2.2 Water: Water shall be clean, potable and sufficient cool (not warmer than 70°F).

PART 3 – EXECUTION

3.1 PREPARATION

- A. General: Prepare substrate in accordance with manufacturer's instructions.
 1. Concrete Subfloors: Prepare substrate in accordance with manufacturer's instructions.
 - a. Prior to proceeding please refer to ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring. All concrete subfloors must be sound, solid, clean, and free of all oil, grease, dirt, curing compounds and any substance that might act as a bond breaker before priming. Mechanically clean if necessary using shot blasting or other. Acid etching and the use of sweeping compounds and solvents are not acceptable.
- B. Crack and Joint Preparation
 1. Moving Joints and Moving Cracks – honor all moving joints such as expansion joints, isolation joints as well as all moving cracks up through the underlayment.
- C. Adhesive residues on concrete must first be tested to make certain they are not water-soluble. Water-soluble adhesives must be completely mechanically removed down to clean concrete. Non-water-soluble adhesives should be prepared to a thin, well-bonded residue using the wet-scraping technique as recommended by the Resilient Floor Covering Institute (www.rfci.com). The prepared residue should appear as nothing more than a transparent stain on the concrete

after scraping.

- D. Non-porous subfloors such as terrazzo, burnished concrete, epoxy coating systems, VCT, ceramic quarry and porcelain tiles must be clean and free of all waxes, sealers dust, dirt, debris and any other contaminant that may act as a bond breaker. If necessary, clean by mechanical methods such as shot blasting.
- E. Wood Subfloors: Prepare substrate in accordance with manufacturer's instructions.
 - 1. The wood subfloor either must be solid hardwood flooring; a minimum of 3/4" (19 mm) tongue-and-groove, APA-rated Type 1, exterior exposure plywood; or an approved OSB equivalent. The wood subfloor must be constructed according to prevailing building codes and must be solid and securely fixed to provide a rigid base free of undue flex. Any boards exhibiting movement must be properly fastened to create a sound, solid subfloor. The surface of the wood must be clean and free of oil, grease, wax, dirt, varnish, shellac and any contaminant that might act as a bond breaker. If necessary, sand down to bare wood. A commercial drum sander can be used to sand large areas. Do not use solvents, strippers or cleaners. Vacuum all dust and debris. Open joints should be filled with ARDEX FEATHER FINISH (or equal). It is the responsibility of the installation contractor to ensure that the wood subfloor is thoroughly clean and properly anchored prior to the installation of any ARDEX material.

3.2 APPLICATION OF ARDEX LU100™:

- A. Examine substrates and conditions under which materials will be installed. Do not proceed with installation until unsatisfactory conditions are corrected.
- B. Coordinate installation with adjacent work to ensure proper sequence of construction. Protect adjacent areas from contact due to mixing and handling of materials.
- C. Priming:
 - 1. Primer for standard absorbent concrete substrates: Dilute ARDEX P-51 1:1 with water and apply evenly with a soft bristled push broom. Do not leave any bare spots. Remove all puddles and excess primer. Allow to dry to a clear, thin film (min. 3 hours, max. 24 hours). Underlayment shall not be applied until the primer is dry. Primer coverage is approximately 400 to 600 sq. ft. per gallon.
 - 2. Primer for extremely absorbent concrete substrates: Make an initial application of ARDEX P-51 mixed with 3 parts water using a soft push broom. Do not leave any bare spots. Remove all puddles and excess primer. Allow to dry thoroughly (1 to 3 hours) before proceeding with the standard application of primer as described above for standard absorbent concrete.
 - 2. Primer for non-porous substrates such as burnished concrete, terrazzo, VCT, ceramic, quarry and porcelain tiles, epoxy coating systems and concrete treated with silicate compounds: Prime with ARDEX P 82 Ultra Prime. Follow the mixing instructions on the container and apply with a short-nap or sponge paint roller, leaving a thin coat of primer no heavier than a thin coat of paint. Do not leave any bare spots. Remove all puddles and excess primer. Allow to dry to a clear, slightly tack film (minimum 3 hours, maximum 24 hours). Underlayment shall not be installed until primer is dry. NOTE: If a suitable acrylic curing compound has been used on the concrete, test the surface for porosity. If the concrete is porous, prime with ARDEX P 51. If it is non-porous, prime with ARDEX P 82.
 - 3. Primer for wood and non-water-soluble adhesive residue on concrete: Prime with

undiluted ARDEX P 51. Apply directly to the prepared wood or non-water-soluble adhesive residue with a short-nap or sponge paint roller, leaving a thin coat of primer. Do not use a push broom. Do not leave any bare spots. Backroll with a dry roller to remove excess primer. Allow primer to dry to a clear, thin film (min. 3 hours, max. 24 hours).

D. Mixing: Comply with manufacturer's printed instructions and the following.

1. Add 4 quarts (3.8 L) of clean potable water per 50 lb. (22.7 kg) bag.
2. Mix using a 1/2" (12 mm, 650 rpm) low speed heavy-duty mixing drill with an ARDEX T-1 mixing paddle. Do not overwater.
3. Aggregate mix: For areas to be installed over 2" (5 cm) thick, aggregate may be added to reduce material costs. Mix ARDEX LU 100 with water first, then add 1 part aggregate by volume of washed, well graded 1/8" to 3/8" (3 – 9.5 mm) pea gravel. Please note that the aggregate size must not exceed 1/3 the depth of the pour. Do not use sand. Note: The addition of aggregate will diminish the workability of the make it necessary to install a finish coat to obtain a smooth surface. Ardex recommends a 1/4" application of ARDEX LU 100 neat to be installed as the finish coat.
4. For pump installations, ARDEX LU 100™ shall be mixed using the ARDEX ARDIFLO™ Automatic Mixing Pumps. Contact the ARDEX Technical Service Department (888) 512-7339 for complete pump operation instructions.

E. Application: Comply with manufacturer's printed instructions and the following.

1. When installing ARDEX LU 100 with the ARDEX T-5 Smoother, install at a minimum thickness of 1/8" (3 mm) over the highest point in the floor, which typically results in an average thickness of 1/4" (6 mm) or more over the entire floor. When installing ARDEX LU 100 with the ARDEX T-6 Spiked Roller, it is possible to install a minimum thickness of 1/16" (1.5 mm) over the highest point, which typically results in an average thickness of 1/8" (3 mm). ARDEX LU 100 can be installed up to 2" (5 cm) thick neat, and up to 5" (12.7 cm) with the addition of proper aggregate. To match existing elevations, ARDEX LU 100 can be tapered to as thin an application as the sand in the material will allow. If a true featheredge is needed, ARDEX recommends using ARDEX FEATHER FINISH for transitions.
2. Pour the mix onto the floor and spread with the ARDEX T-4 Spreader. Immediately smooth the material with the ARDEX T-5 Smoother, or spike roll the material with the ARDEX T-6 Spiked Roller. Work in a continuous manner during the entire self-leveling installation. Wear baseball or soccer shoes with non-metallic cleats to avoid leaving marks in the liquid ARDEX LU 100.

F. Curing

1. Floor coverings can be installed after the underlayment has dried thoroughly. Allow the installation to dry a minimum of 48 hours prior to mat testing in accordance with ASTM D4263. To do this, place a piece of heavy plastic or a smooth rubber mat down over a 2' X 2' area. After 24 hours, lift the barrier material and inspect for surface darkening. A darkened area indicates excessive moisture is still present, and further drying time is required. Repeat the above test at regular intervals until no darkening is observed.
2. Once the installation is deemed dry, prime the entire area with ARDEX P 51 mixed with 3 parts water by volume. Apply the primer as outlined in the Priming section. Allow drying to a clear, thin film (min. 3 hours, max. 24 hours) before applying the thin set mortar or adhesive and floor covering. The application of ARDEX P 51 will help ensure that the adhesive or setting material has sufficient open time prior to placing the floor covering.
3. Drying time is a function of jobsite temperature and humidity conditions. While a 1/4" (6 mm) thick installation may be dry enough for some types of floor covering after only a few days, additional drying time may be necessary for deeper installations or for the

installation of more moisture-sensitive flooring. Low substrate temperatures and/or high ambient humidity will extend the drying time. Adequate ventilation and heat will aid drying. Forced drying can dry the surface of the underlayment prematurely and is not recommended.

3.3 FIELD QUALITY CONTROL

- A. Where specified, field sampling of the underlayment is to be done by taking an entire unopened bag of the product being installed to an independent testing facility to perform compressive strength testing in accordance with ASTM C 109/modified: air-cure only. There are no in situ test procedures for the evaluation of compressive strength.

3.4 PROTECTION

- A. Prior to the installation of the finish flooring, the surface of the underlayment should be protected from abuse by other trades by the use of plywood, Masonite or other suitable protection course.

3.5 CLEANING

- A. Clean work under provisions of Section 01 70 00.
- B. Do not permit traffic over underlayment for 24 hours after the installation.

END OF SECTION

SECTION 04 03 05

MORTAR REPOINTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. All labor and materials for the repointing of the existing mortar.

1.02 REFERENCES

- A. American Society for testing materials (ASTM)

1.03 QUALIFICATIONS

- A. Company specializing in repointing of masonry.

1.04 QUALITY ASSURANCE

- A. Preconstruction Conference: A preconstruction conference to be attended by representatives of the Owner and all key personal of the Design/Builder including project managers, field supervisors and foreman will be held prior to the start of work for the purpose of reviewing existing conditions, organizing the start of field-constructed mock-ups, reviewing access to power and water, storage of materials and equipment, protection of the building and site, protection of the public, disposal of construction waste, the development of the Work Program submittal, and any other conditions of the work as considered relevant by the Owner and any Consultants.
- B. Field-Constructed Mock-Ups: Prior to start of general masonry restoration, prepare the following mock-ups where directed by Owner. Obtain Owner's acceptance of visual qualities before proceeding with the work. Mock-ups will be used to measure standards of workmanship, finish, texture, color and qualifications of workman. Repeat mock-up procedure as required until Owner's acceptance is obtained. Protect and mark acceptable mock-ups, retain in undisturbed condition during construction to be used as a standard for judging completed work.
 - 1. Cutting out mortar joints.
 - 2. Back filling mortar joints.
 - 3. Finish pointing of mortar joints.

1.05 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product data: Submit manufacturers' technical data and Materials Safety Data Sheet for each product specified or proposed for use including recommendations for their application and use.

- C. Samples of each type of lime, cement, aggregate, patching mortar and colorant proposed for use. Provide closed labeled container of original for inspection at the site by the Owner. Provide sample of each color and type proposed for use.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products to site under provisions of Section 01 60 00.
- B. Protect materials during storage and construction. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Protect persons, motor vehicles, site furniture and landscaping, all building surfaces (including but not limited to masonry, window glass and frames, roof and flashing, doors and related fixtures, all metals, fittings and equipment of the building and building site.
 - 1. In the event of damage, make all repairs and replacements necessary to restore items to their preconstruction condition and to the approval of the Owner at no additional cost to the Owner.
- B. Protect all intake vent and grills, windows and doors from dust, water spray, fumes or chemicals. Protect interior from dust.
- C. Mortar work may be carried out only when air temperatures are 45°F and above and will remain at that temperature or above for not less than 7 days after completion of clean-up. Prevent mortar, adhesives or grout from staining surrounding masonry. Remove any spill immediately. Protect sills, ledges and other protection from mortar droppings by coating with sand. No spills shall be permitted to remain at the end of each work day.
- D. No mortar work will be allowed in wet weather or when rain is predicted within two days unless work is protected within waterproof enclosures.
- E. Cover work at the end of each day and whenever work is not in progress. Extend waterproof covers securely over work area.

1.08 GUARANTEE

- A. Provide written warranty ensuring that all mortar joints that are determined to become cracked, spalled, hairlined, discolored or stained from construction materials, displaced, enlarged or otherwise unacceptable as well as stone that becomes cracked, stained from construction related materials, displaced or spalled within a period of five (5) years from the date of completion will be repaired or replaced in a manner conforming with the requirements of this specification at no additional cost to the Owner.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Naturally hydraulic lime, NHL 3.5. Imported by Virginia Lime Works and manufactured by St. Astier's lime, France or accepted equal.
- B. Mortar Aggregate. Well-graded sharp bagged mason's mortar sand, ASTM C 144, further modified by the requirement that the aggregate match to the sample of the original mortar aggregate. Original mortar shall be taken from within the wall, surface mortars are not original. Design/Builder shall be responsible for obtaining separated (extracted from mortar by acid digestion) aggregate sample from the mortar as part of the work of this contract.
- C. Water shall be clean and free from deleterious materials. Only potable water may be used.
- D. Mortar Pigments. Iron oxide pigments manufactured by SGS (Solomon Grind Chem) or Lander-Segal or approved equal. Pigments shall be used only if an acceptable mortar color match cannot be obtained without pigments.
- E. Excess Mortar solvent: Hydroclean 455, EaCo Chem NMD 80. SureKlean 600 is not acceptable. Concentration shall be minimum necessary to remove excess mortar at joint perimeters.

PART 3 - EXECUTION

3.01 REPOINTING MASONRY

- A. Rake out and repoint joints to the following extent:
 - 1. All joints in areas indicated.
 - 2. Joints where mortar is missing or where they contain holes.
 - 3. Cracked joints where cracks can be penetrated at least 1/4 inch by a knife blade 0.027 inch thick.
 - 4. Joints where they sound hollow when tapped by metal object.
 - 5. Joints where they are worn back 1/4 inch or more from surface.
 - 6. Joints where they are deteriorated to point that mortar can be easily removed by hand, without tools.
 - 7. Joints where they have been filled with substances other than mortar.
- B. Do not rake out and repoint joints where not required.
- C. Notify Owner of unforeseen detrimental conditions including voids in mortar joints, cracks, loose masonry units, rotted wood, rusted metal, and other deteriorated items.
- D. Joint preparation.
 - 1. Cut back to a depth of at least one (1) inch or to sound mortar, whichever is greater. All loose material shall be washed from the joints using a hose. Joints shall be wetted before the new mortar is applied.

2. Joint cutting: Single blade power operated rotary saws providing a single cut down the middle of the joint may be used upon written acceptance of the Owner of satisfactory completion of mock-up installation of joint cutting technique by each mechanic who will be cutting joints. Power cutting will not be permitted at ends of head joints, inside corners, around quoins and keystones and at other locations where it is determined that power cutting is likely to result in damage to the stone due to overcutting.
- E. Mortar preparation and mixing.
1. The hydraulic lime and sand shall be carefully measured and well mixed together dry. Any pigment should be added in measured quantities and well dispersed into the other materials. Mortar shall be mixed in small batches so that it will be used within one hour after preparation. Prehydrate pointing mortar as follows: thoroughly mix together all ingredients except water, then mix again adding only enough water to produce a damp unworkable mix which will retain its form when pressed in a ball. After 1-2 hours, add sufficient water to bring mortar to proper consistency, somewhat drier than conventional setting mortar. Additionally follow all recommendations of lime supplier; in event of conflict between specification and manufacturer's written recommendations, manufacturer's recommendation shall prevail.
Color to match existing clean mortar to the satisfaction of the Owner.
- F. Mortar Proportions
1. Repointing and Setting mortar:

1 Part by volume Moderately Hydraulic Lime, NHL 3.5.
2.5 Parts volume mortar sand, measured as damp, loose sand. If bagged sand is used diminish sand volume by equivalent proportion.
- G. Joint filling. Mortar should be packed in thin layers, not exceeding 1/2". Compact and allow each layer to become thumbprint hard before installation of new lift. No mortar shall extend onto the face of the units. Joint finish detail to be determined to blend/match surround work. All joints shall be kept as narrow as possible.
- H. Damp Cure mortar. Mist face mortar for at least 24 hours after tooling. In windy or hot weather, review cure procedures with the Owner to ensure that more that does not excessively fast.
- I. Clean-up. Excess mortar should be removed from the surface before it sets using a bristle brush or by rubbing the surface with burlap or clean sand. Dried mortar may be removed with chemical mortar remover by written Permission of the Owner.
- J. Any joints that develop hairline cracking, become unbonded, are friable after seven day cure period, or are otherwise defective in the opinion of the Owner, shall be cut out and repointed at no cost to the Owner.

3.02 FINAL CLEANING

- A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure.
 - 1. Do not use metal scrapers or brushes.
 - 2. Do not use acidic or alkaline cleaners.
- B. Wash adjacent woodwork and other nonmasonry surfaces. Use detergent and soft brushes or cloths.
- C. Sweep and rake adjacent pavement and grounds to remove mortar and debris. Where necessary, pressure wash pavement surfaces to remove mortar, dust, dirt, and stains.

END OF SECTION

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SECTION 04 22 24

REINFORCED MASONRY
INTERIOR

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes unit masonry assemblies consisting of the following:

- 1. Concrete masonry units.
- 2. Mortar and grout.
- 3. Reinforcing steel.
- 4. Masonry joint reinforcement.
- 5. Ties and anchors.
- 6. Miscellaneous masonry accessories.

1.03 PERFORMANCE REQUIREMENTS

- A. Provide unit masonry that develops the following net-area compressive strengths (f'm) at 28 days. Determine compressive strength of masonry by testing masonry prisms according to ASTM C 1314.
 - 1. For Concrete Unit Masonry: f'm = 1500 psi.
- B. Masonry Grout: 3000 psi compressive strength at 28 days.

1.04 SUBMITTALS

- A. Comply with provisions of Section 01 33 00.
- B. Product Data: For each different masonry unit, accessory, and other manufactured product specified.
- C. Shop Drawings: Show fabrication and installation details for the following:
 - 1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement." Show elevations of reinforced walls.
- D. Samples for Verification: For the following:
 - 1. Full-size units for each different exposed masonry unit required, showing the full range of exposed colors, textures, and dimensions to be expected in the completed construction.
 - 2. Colored mortar Samples for each color required, showing the full range of colors expected in the finished construction. Make samples using the same sand and mortar ingredients to be used on Project. Label Samples to indicate types and amounts of pigments used.
 - 3. Accessories embedded in the masonry.
- E. Qualification Data: For firms and persons specified in "Quality Assurance" Article.
- F. Material Test Reports: From a qualified testing agency indicating and interpreting test results of the following for compliance with requirements indicated:
 - 1. Each type of masonry unit required.
 - a. Include size-variation data for cmu, verifying that actual range of sizes falls within specified tolerances.
 - b. Include test results, measurements, and calculations establishing net-area compressive strength of masonry units.
 - 2. Mortar complying with property requirements of ASTM C 270.
 - 3. Grout mixes complying with compressive strength requirements of ASTM C 476. Include description of type and proportions of grout ingredients.

- G. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
1. Each type of masonry unit required.
 - a. Include size-variation data for cmu, verifying that actual range of sizes falls within specified tolerances.
 - b. Include test data, measurements, and calculations establishing net-area compressive strength of masonry units.
 2. Each cement product required for mortar and grout, including name of manufacturer, brand, type, and weight slips at time of delivery.
 3. Each combination of masonry unit type and mortar type. Include statement of net-area compressive strength of masonry units, mortar type, and net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.
 4. Each material and grade indicated for reinforcing bars.
 5. Each type and size of joint reinforcement.
 6. Each type and size of anchor, tie, and metal accessory.

1.05 QUALITY ASSURANCE

- A. Comply with provisions of Section 01 45 00.
- B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1093 to conduct the testing indicated, as documented according to ASTM E 548.
- C. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.
- D. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.
- E. Preconstruction Testing Service: Engage a qualified independent testing agency to perform the following preconstruction testing:
1. Concrete Masonry Unit Test: For each concrete masonry unit indicated, per ASTM C 140.
 2. Prism Test: For each type of wall construction indicated, per ASTM C 1314.
 3. Mortar Test: For mortar properties per ASTM C 270.
 4. Grout Test: For compressive strength per ASTM C 1019.
- 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.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Comply with Section 01 60 00.
- B. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
1. Protect Type I concrete masonry units from moisture absorption so that, at the time of installation, the moisture content is not more than the maximum allowed at the time of delivery.
- C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

- E. Deliver preblended, dry mortar mix in moisture-resistant containers designed for lifting and emptying into dispensing silo. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in a metal dispensing silo with weatherproof cover.
- F. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.07 PROJECT CONDITIONS

- A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and from mortar splatter by coverings spread on ground and over 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 onto completed masonry.
- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
 - 1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.
- E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
 - 1. When ambient temperature exceeds 100 deg F, or 90 deg F with a wind velocity greater than 8 mph, do not spread mortar beds more than 48 inches ahead of masonry. Set masonry units within one minute of spreading mortar.

1.08 REFERENCE STANDARDS

- A. ACI 530/ASCE 5/TMS 402: Building Code Requirements for Masonry Structures
- B. ACI 530.1/ASCE 6/TMS 602: Specification for Masonry Structures
- C. ASTM A82: Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
- D. ASTM C90: Standard Specification for Load bearing Concrete Masonry Units
- E. ASTM C144: Standard Specification for Aggregate for Masonry Mortar
- F. ASTM C150: Standard Specification for Portland Cement
- G. ASTM C207: Standard Specification for Hydrated Lime for Masonry Purposes
- H. ASTM C270: Standard Specification for Mortar for Unit Masonry
- I. ASTM C404: Standard Specification for Aggregates for Masonry Grout
- J. ASTM C476: Standard Specification for Grout for Masonry
- K. ASTM C780: Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
- L. ASTM C1019: Standard Test Method for Sampling and Testing Grout

- M. ASTM C1314: Standard Test Method for Compressive Strength of Masonry Prisms
- N. AWS D1.4: American Welding Society Structural Welding Code – Reinforcing Steel

PART 2 - PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. General: Provide shapes indicated and as follows:
 - 1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
 - 2. Provide bullnose units for outside corners, unless otherwise indicated.
- B. Concrete Masonry Units (Decorative and Standard): ASTM C 90
 - 1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi.
 - 2. Weight Classification: Normal weight, unless otherwise indicated.
 - 3. Provide Type I, moisture-controlled units.
- C. Color
 - 1. Exposed concrete block to be painted as specified in Section 09900 – Painting. Color to be selected by Owner from manufacturer's standard colors.
- D. Finish
 - 1. Exposed faces are to be **[smooth faced] [smooth faced single score]**.

2.02 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.
- B. Hydrated Lime: ASTM C 207, Type S.
- C. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207.
- D. Mortar Cement: ASTM C 1329.
- E. Masonry Cement: ASTM C 91.
- F. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch thick, use aggregate graded with 100 percent passing the No. 16 sieve.
- G. Aggregate for Grout: ASTM C 404.
- H. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar.
- I. Water: Potable.

2.03 REINFORCING STEEL

- A. Comply with reinforcing requirements in Section 03300, Cast-in-Place Concrete.
- B. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; Grade 60.
- C. Epoxy-Coated Reinforcing Steel: ASTM A 615/A 615M, Grade 60; epoxy coated to comply with ASTM A 775/A 775M.

2.04 MASONRY JOINT REINFORCEMENT

- A. General: ASTM A 951 and as follows:
 - 1. Hot-dip galvanized, carbon-steel wire.
 - 2. Wire Size for Side Rods: W2.8 or 0.188-inch diameter.
 - 3. Wire Size for Cross Rods: W2.8 or 0.188-inch diameter.
 - 4. Provide in lengths of not less than 10 feet, with prefabricated corner and tee units where indicated.
- B. For single-wythe masonry, provide either ladder or truss type with single pair of side rods and cross rods spaced not more than 16 inches o.c.

2.05 TIES AND ANCHORS, GENERAL

- A. General: Provide ties and anchors, made from materials that comply with this Article, unless otherwise indicated.
- B. Hot-Dip Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.
- C. Steel Sheet, Galvanized after Fabrication: ASTM A 366/A 366M cold-rolled, carbon-steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153.
- D. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.06 MISCELLANEOUS ANCHORS

- A. Anchor Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations:
 - 1. Headed bolts.
 - 2. Nonheaded bolts, bent in manner indicated.
- B. Postinstalled Anchors: Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
 - 1. Type: Chemical anchors.
 - 2. Type: Expansion anchors only as noted on drawings.
 - 3. For Post installed Anchors in Concrete: Capability to sustain, without failure, a load equal to four times the loads imposed.

2.07 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from PVC.
- B. Preformed Control-Joint Gaskets: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.
- C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).
- D. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells. Units are formed from 0.142-inch steel wire, hot-dip galvanized after fabrication.

2.08 MASONRY CLEANERS

- A. Job-Mixed Detergent Solution: Solution of 1/2-cup dry measure tetrasodium polyphosphate and 1/2-cup dry measure laundry detergent dissolved in 1 gal. of water.
- B. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

2.09 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in the form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site.
- C. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification.
 - 1. For masonry below grade, in contact with earth, and where indicated, use Type M.
 - 2. For reinforced masonry and where indicated, use Type S.

- D. Grout for Unit Masonry: Comply with ASTM C 476.
 - 1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 5 of ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
 - 2. Provide grout with a slump of 8 to 10 inches as measured according to ASTM C 143.

2.10 SOURCE QUALITY CONTROL

- A. Concrete Masonry Unit Tests: For each type of concrete masonry unit indicated, units will be tested according to ASTM C 140.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance.
 - 2. Verify that reinforcing dowels are properly placed.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Before installation, examine rough-in and built-in construction to verify actual locations of piping connections.

3.02 INSTALLATION, GENERAL

- A. Build single-wythe walls to the actual widths of masonry units, using units of widths indicated.
- B. Build chases and recesses to accommodate items specified in this Section and in other Sections of the Specifications.
- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to the opening.
- D. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

3.03 CONSTRUCTION TOLERANCES

- A. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:
- B. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet, nor 1/2 inch maximum.
- C. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, nor 1/2 inch maximum.
- D. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4 inch in 20 feet, nor 1/2 inch maximum.
- E. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.

3.04 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.
- B. Bond Pattern for Exposed Masonry: Lay exposed masonry in a running bond pattern unless noted otherwise. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

- C. Stopping and Resuming Work: In each course, rack back one-half-unit length for one-half running bond or one-third-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar before laying fresh masonry.
- D. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
- E. Fill space between hollow-metal frames and masonry solidly with mortar, unless otherwise indicated.
- F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
- G. Fill cores in hollow concrete masonry units with grout 24 inches under anchor bolt locations unless otherwise indicated.

3.05 MORTAR BEDDING AND JOINTING

- A. Lay hollow masonry units as follows:
 - 1. With full mortar coverage on horizontal and vertical face shells.
 - 2. Bed webs in mortar.
 - 3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.

3.06 CAVITIES

- A. Keep cavities clean of mortar droppings, debris, and other materials during construction. Strike joints facing cavities flush.
 - 1. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.

3.07 MASONRY JOINT REINFORCEMENT

- A. General: Provide continuous masonry joint reinforcement as indicated. Install entire length of longitudinal side rods 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. Space reinforcing a maximum of 16" on center.
- B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.
- C. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.08 ANCHORING MASONRY TO STRUCTURAL MEMBERS

- A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:
 - 1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
 - 2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.
 - 3. Space anchors as indicated, but not more than 16 inches o.c.

3.09 CONTROL AND EXPANSION JOINTS

- A. General: Install control and expansion joints in unit masonry where indicated or a maximum of 25 feet on center. Build-in related items as masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.
- B. Form control joints in concrete masonry as follows:
 - 1. Fit bond-breaker strips into hollow contour in ends of concrete masonry units on one side of control joint. Fill resultant core with grout and rake joints in exposed faces.

2. Install preformed control-joint gaskets designed to fit standard sash block.
3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar or rake joint.

3.10 LINTELS

- A. Install steel lintels where indicated or as required for masonry openings shown on drawings. Lintel sizes to be sufficient to support weight of masonry and deflection requirements.
- B. Provide masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.
 1. Provide prefabricated or built-in-place masonry lintels. Use specially formed bond beam units with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.
- C. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

3.11 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.
 1. Construct formwork to conform to shape, line, and dimensions shown. Make it 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.
 2. 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.
- B. Placing Reinforcement: Comply with requirements of ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.
 1. Comply with requirements of ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

3.12 FIELD QUALITY CONTROL

- A. Testing Frequency: Tests and Evaluations listed in this Article will be performed during construction for each 5000 sq. ft. of wall area or portion thereof.
- B. Mortar properties will be tested per ASTM C 780.
- C. Grout will be sampled and tested for compressive strength per ASTM C 1019.
- D. Concrete Masonry Unit Tests: For each type of concrete masonry unit indicated, units will be tested according to ASTM C 140.
- E. Prism-Test Method: For each type of wall construction indicated, masonry prisms will be tested per ASTM C 1314, and as follows:
 1. Two prisms for each type of masonry.

3.13 REPAIRING, POINTING, AND CLEANING

- A. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- B. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Owner's approval of sample cleaning before proceeding with cleaning of masonry.
 3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.

4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing the surfaces thoroughly with clear water.
5. Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.

3.14 MASONRY WASTE DISPOSAL

- A. Recycling: Unless otherwise indicated, excess masonry materials are Design/Builder's property. At completion of unit masonry work, remove from Project site.
- B. Excess Masonry Waste: Remove excess, clean masonry waste that cannot be used as fill, as described above, and other masonry waste, and legally dispose of off Owner's property.

END OF SECTION

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SECTION 05 12 00

STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Structural steel framing members with required welds and fasteners,
- B. Baseplates.
- C. Shear stud connectors.

1.02 WORK FURNISHED BUT INSTALLED BY OTHERS

- A. Division 3: Anchorages cast in concrete.
- B. Division 4: Lintels installed in masonry.

1.03 TESTING AGENCY

- A. Inspection and testing will be performed by a firm hired by the Design/Builder and approved by the Owner.
Cost is to be deducted from the Testing and Inspection Allowance.
- B. Provide free access to work and cooperate with testing firm.

1.04 QUALITY ASSURANCE

- A. Qualify welding processes and welding operators in accordance with AWS Standards.

1.05 REFERENCES

- A. AISC Publications:
 - 1. Code of Standard Practice.
 - 2. Specification for the Design, Fabrication and Erection of Structural Steel for Building including all supplements.
 - 3. Specification for Structural Joints using ASTM |A325 or A490 Bolts, including Errata.
- B. ASTM Standards:
 - 1. A6: General Requirements for Rolled Steel Plates, Shapes, Sheet Piling and Bars for structural use.
 - 2. A36: Structural Steel.
 - 3. A53: Welded and Seamless Steel Pipe.
 - 4. A123: Zinc Hot Galvanized Coatings.
 - 5. A434: Steel Bars, Alloy, Quenched and Tempered.
 - 6. A307: Carbon Steel Externally and Internally Threaded Standard Fasteners.
 - 7. A325: High Strength Bolts for Structural Steel Joints, including Suitable Nuts and Plain Hardened Washers.
 - 8. A490: Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints.
 - 9. A500: Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

- C. AWS Standards:
 - 1. Standard Qualification Procedure.
 - 2. D1.1: Structural Welding Code.
- D. SSPC: SP-2 Power Tool Cleaning.

1.06 SUBMITTALS

- A. Submit shop drawings under provisions of Section 01 33 00.
- C. Indicate profiles, sizes, spacing and locations of structural members, connections, attachments, cuts, fasteners, cambers and loads.
- D. Indicate welded connections using standard AWS welding symbols and not weld lengths.
- E. Provide details and schedules indicating fabrication and shop assembly of members and sequence of erection including procedures and diagrams.
- F. Provide setting drawings, templates and directions for the installation of anchor bolts and other anchorages to be installed by others.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle materials under provisions of Section 01 60 00.
- B. Deliver materials to the site at such intervals to ensure uninterrupted progress of the work.
 - 1. Deliver anchor bolts, anchorage devices and lintels which are to be embedded in cast-in-place concrete or masonry, in ample time to not delay that work.
 - 2. Accompany with Owner-reviewed setting drawings templates and directions for the installation of embedded items.
- C. Store materials to permit easy access for inspection and identification. Keep steel members off the ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.
- D. Do not store materials on the structure in a manner that might cause distortion or damage to the members of the supporting structures.

1.08 DESIGN OF MEMBERS AND CONNECTIONS

- A. All details shown are typical; similar details apply to similar conditions, unless otherwise indicated. Verify dimensions at the site whenever possible without causing delay in the work.
- B. Promptly notify the Owner whenever design of members and connections for any portion of the structure are not clearly indicated.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Rolled Steel Plates, Shapes and Bars: ASTM A-36, except where other type steel is shown.
- B. Cold-Formed Steel Tubing: ASTM A-500, Grade B.
- C. Steel Pipe: ASTM A-53, Type E or S, Grade B.
- D. Anchor Bolts: ASTM A-307, nonheaded type unless otherwise indicated.
 - 1. Provide hexagonal heads and nuts for all connections.
- E. High Strength Threaded Fasteners: heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers to be of quenched and tempered medium carbon steel complying with ASTM A-325 or ASTM A-490.
- F. Electrodes for Welding: comply with AWS Code.
- G. Structural Steel Primer Paint: TNENEC 99 or Fabricator's Standard.
- H. Non-metallic Non-shrink Grout: pre-mixed, non-metallic, non-corrosive, non-shrink, and non-staining product containing selected silica sands, portland cement, shrinkage compensating agents, plasticizing and water reducing agents.

2.02 FABRICATION

- A. Shop Fabrication and Assembly:
 - 1. Fabricate and assemble structural assemblies in the shop to the greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on the final shop drawings. Provide camber in structural members as required.
 - 2. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
 - 3. Where finishing is required, complete the assembly, including welding of units, before start of finished operations. Provide finish surfaces of members exposed in the final structure free of markings, burrs and other defects.
- B. Connections:
 - 1. Weld or bolt shop connections.
 - 2. Bolt field connections, except where welded connections or other connections are required.
 - 3. Provide high-strength threaded fasteners for all principal bolted connections.
 - 4. High Strength Bolted Construction: install high-strength threaded fasteners in accordance with AISC "Specifications for Structural Joints using ASTM A-325 or A-490 Bolts".
 - 5. Welded Construction: comply with AWS Code for procedures, appearance and quality of welds and method used in correcting welding work.
 - 6. Assemble and weld built-up sections by methods which will produce true alignment of axes without warp.
- C. Holes for Other Work:
 - 1. Provide holes required for securing other work to structural steel framing and for the passage of other work through steel framing members as shown on the final shop drawings. Provide threaded nuts welded to framing and other specialty items to receive other work.

2. Cut, drill or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

D. Shop Painting:

1. General:
 - a. Shop paint all structural steel work, except those members or portions of members to be embedded in concrete or mortar. Paint embedded steel which is partially exposed on the exposed portions and the initial 2" of embedded areas only.
 - b. Do not paint surfaces which are to be welded.
 - c. Apply two coats of paint to surfaces which are inaccessible after assembly or erection. Change color of second coat to distinguish it from the first.
2. Surface Preparation: after inspection and before shipping, clean steelwork to be painted. Remove loose rust, loose mill scale and spatter, slag or flux deposits. Clean steel in accordance with Steel Structures Painting Council (SSPC) SP-3 "Power Tool Cleaning".
3. Painting: immediately after surface preparation, apply structural steel primer paint in accordance with the manufacturer's instructions and at a rate to provide a uniform dry film thickness of 2.0 mils. Use painting method which will result in full coverage of 2.0 mils. Use painting method which will result in full coverage of joints, corners, edges and all exposed surfaces.

E. Galvanized Steel:

1. Where required, hot-dip galvanizing shall conform to ASTM A-123. Galvanized coatings shall successfully withstand the Preece test referred to in the foregoing standard. Hot-dip galvanizing on assembled steel products shall conform to ASTM A-434. All galvanizing shall be done after fabrication.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Erector must examine the areas and conditions under which structural steel work is to be installed and notify the Design/Builder in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the erector.

3.02 ERECTION

- A. General: comply with the AISC Specifications and Code of Standard Practice and as herein specified.
- B. Temporary Shoring and Bracing: provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of the structures as erection proceeds.
- C. Temporary Planking: provide temporary planking and working platforms as necessary to complete the work effectively.
- D. Anchor Bolts:
 1. Furnish anchor bolts and other connectors required for securing structural steel to foundations and other in place work.
 2. Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations.

3. Refer to Division 3 for anchor bolt installation requirements in concrete and Division 4 masonry installations.

E. Setting Bases and Bearing Plates:

1. Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean the bottom surfaces of base and bearing plates.
2. Set loose and attached base plates and bearing plates for structural members on wedges or other adjusting devices.
3. Tighten the anchor bolts after the supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with the edge of the base or bearing plate prior to packing with grout.
4. Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials and allow to cure in strict compliance with the manufacturer's instructions or as otherwise required.

F. Field Assembly:

1. Set structural frames accurately to the lines and elevations required. Align and adjust the various members forming a part of a complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
2. Level and plumb individual members of the structure within specified AISC tolerances.
3. Splice members only where necessary.
4. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment and the removal of paint on surfaces adjacent to field welds.
5. Do not enlarge holes in members by burning or by the use of drift pins, except in secondary members. Ream holes that must be enlarged to admit bolts.

- G. Gas Cutting: do not use gas cutting torches in the field for correcting fabrication errors in the structural framing. Cutting will be permitted only on secondary members which are not under stress.

- H. Touch-up Painting: immediately after erection, clean field welds, bolted connections, and abraded areas of the shop paint. Apply paint to exposed areas with the same material as used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils. Use galvanizing repair paint to correct damaged or abraded areas of galvanized members and to cover and protect field welds in galvanized members.

3.02 FIELD QUALITY CONTROL

A. Testing Agency shall perform the following:

1. Inspection of connections and assemblages of erected structural steel for conformance with the requirements specified.
 - a. Inspection of field welds shall be in accordance with AWS "Structural Welding Code".
 - b. Inspection of field assembled High Strength Bolted construction shall be in accordance with Section 6, AISC Specification for Structural Joints.

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SECTION 05 50 00

MISCELLANEOUS METAL WORK

PART 1 - GENERAL

1.01 SUMMARY

A. Related Documents:

The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.02 SECTION INCLUDES

A. Miscellaneous metal work items as described in this Specification Section.

B. Section includes, without limitation, providing and installing:

1. Shop applied ferrous metals priming paint for miscellaneous metals.
2. Anchorages, brackets, supports, inserts and backing required for a complete job but not included in other sections.
3. All other ferrous or non-ferrous metal work not specifically given to other Sections and necessary for a complete job, but including:
 - b. Galvanized steel framing, lintels and supports for overhead doors. (Structural HSS tube, structural steel bent plate door jambs.
 - c. Galvanized steel framing and supports for mechanical and electrical equipment.

C. Items To Be Furnished Only: Furnish the following items for installation by the designated Sections

1. Section 03 30 00 - Cast-in-place Concrete:
 - a. Sleeves, anchors, inserts, plates and similar items.
2. Section 04 22 23 – Masonry:

Miscellaneous metal and iron sleeves, anchors, inserts, plates and lintels to be built into masonry walls, including:

 - a. Furnishing loose bearing plates with headed anchors to support steel beams and metal deck on masonry.
 - b. Loose steel bearing and leveling plates, including bearing plates for steel joists, beams and purlins, galvanized at exterior locations and in exterior walls.
 - c. Epoxy anchors to fasten seismic clips to masonry.
 - d. Anchor bolts to fasten spandrel beams to masonry.
 - e. Galvanized steel lintels at exterior locations.
 - f. Steel lintels with shop applied zinc-rich primer at interior locations.

3. Miscellaneous items
 - a. Miscellaneous steel trim, galvanized at exterior locations.
 - b. Pipe Railings. See additional information below.
 - c. Metal Ladder: See additional information below.
 - d. Wrought Iron Railing: See additional information below.
 - e. All plates, threaded rods and angles required to support suspended HVAC units from building structure.

1.03 RELATED SECTIONS

- A. Section 03 30 00 – Cast-in-place Concrete
- B. Section 04 22 23 - Concrete Unit Masonry
- C. Section 09 90 10 – Painting

1.03 SUBMITTALS

- A. Submit shop drawings, product data under provisions of Section 01 33 00. Include plans, elevations, sections, details, and attachments to other work. Show anchorage and accessory items.
- B. Submit samples of product as requested by the architect. Submit 8" square samples of each metal shop or factory finish (final surface treatment) required. Prepare samples on metal of same alloy and gauge to be used for the work. Label each sample to identify substrate material and finish. Provide hardware samples.
- C. Manufacturer's Data: Submit manufacturer's specifications, anchor details and installation instructions for any prefabricated products to be used in the work of this section

1.04 REGULATORY REQUIREMENTS

- A. Conform to all federal, state, and local codes.

1.05 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Engineering Calculations: Calculations stamped by a registered professional engineer are required for load bearing fabrications. The Structural Engineer's written approval of such calculations shall be obtained before commencing fabrication

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.

1.07 FIELD MEASUREMENTS

- A. Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.01 GENERAL FABRICATION REQUIREMENTS

- A. Welding shall conform to the applicable requirements of the American Welding Society. Welding shall be done in a manner that will prevent permanent buckling and all welds exposed in the finished work shall be ground to an architectural quality smooth appearance approved by the Architect.
- B. Exposed surfaces shall have a smooth finish and sharp, well defined lines. Sections shall be formed to shape and size with sharp lines and angles. Curved work shall be sprung evenly.
- C. Necessary rabbets, lugs and brackets shall be provided so that work can be assembled and anchored in a neat and substantial manner. Holes for bolts and screws shall be drilled. Fastenings shall be concealed where practicable.
- D. Work shall be fabricated and installed in a manner that will provide for expansion and contraction, prevent the shearing of bolts, screws and other fastenings, insure rigidity and provide close fitting of sections. Joints exposed to the weather shall be formed to exclude water.
- E. All galvanized metal shall bear a stamp indicating ASTM number and weight of zinc coating in ounces per square foot.

2.02 MATERIALS

- A. Materials shall conform to the latest edition of the specifications or manufacturer's standards.
 - 1. Steel Shapes ASTM A-36 Bars & Plates
 - 2. Anchor Bolts ASTM A-307 Grade A
 - 3. Structural Bolts ASTM A-325 (unless shown or indicated otherwise)
 - 4. Weld Material E70XX Welding Electrodes For manual shielded metal-arc welding, AWS A5.1 or A5.5, E60 or E70 series
 - 5. Galvanizing ASTM A-123, , or A-153 as applicable; 2.0 ounces zinc per square foot, unless otherwise indicated; provide under its section.
 - 6. Bitumastic Preservative Mil-P-15230 [Where shown and all embedded steel]
 - 7. Galvanized Sheet Steel ASTM A-526 or A-526, G-90
 - 8. Hot-Rolled Carbon Steel Bars (and Bar-Size Shapes): ASTM A-36 or A-529, grade as selected by fabricator.
 - 9. Brackets, flanges and exposed fastenings: Shall be of the same materials, color and finish as the metal to which they are applied, unless shown or specified otherwise.
 - 10. Expansion bolts at concrete: "Redhead" wedge anchors.
 - 11. Expansion bolts at CMU: Hilti epoxy/masonry anchors
- B. Hangers and suspension: Where required, provide "Uni-strut" A1000 or assemblies of types recommended by manufacturer for application.
- C. Galvanizing Repair Paint: High zinc dust content paint, "ZRC", having 95% zinc. by weight. Two coats always are required.

2.03 SHOP PAINTING

- A. All surfaces of ferrous metal except galvanized steel shall be given a shop coat of red lead, zinc-chromate paint or other approved rust-inhibitive primer unless otherwise specified. All surfaces which will be inaccessible for painting after erection, except contact surfaces of riveted or welded connections, shall be given two coats of paint before being assembled or erected. All marred surfaces of shop coats shall be thoroughly recoated. Field painting is specified under Section 09 91 00.

2.04 ANCHORING CEMENT:

- A. Anchoring non-shrink grout shall be Hallemite "Por-rok" or equal.

2.05 CLEANING:

- A. Clean under provisions of Section 01 70 00.
- B. The Contractor shall clean the miscellaneous metal work by removing all excess sealants, dirt and foreign materials, restoring finishes, leaving work in a good and satisfactory condition. The Contractor shall perform the work of cleaning using methods and materials as recommended by the manufacturers of the materials used and as approved.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Review existing field conditions of areas to receive the work of this Section before proceeding with fabrication. Do not proceed with installation of metal fabrications until all unsatisfactory conditions which would impair the strength or appearance of the work have been corrected.

3.02 INSTALLATION OF METAL FABRICATIONS

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners and furnish all necessary setting drawings, diagrams, and templates where necessary for securing miscellaneous metal items to in-place construction including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws and other connectors as required. Use galvanized bolts at exterior. Coordinate delivery of such items to project site.
- B. Cutting: Perform cutting, drilling and fitting required for installation of miscellaneous metal items. Do not cut structural members in field to facilitate fitting without written permission of the Architect for each specific condition.
- C. Fitting: Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Grind joints smooth. Do not weld, cut or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

- D. Placement: Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry or similar construction.
- E. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, and methods used in correcting welding work. Do not field weld stainless steel or aluminum.
- F. Grouting: Set bearing plates required for support of the work of this Section level and to correct elevation using steel shims or wedges and grout solid using specified non-shrink grout.
- G. Touch-Up of Shop Primers: Touch up field welds and unprimed steel using specified shop primers and following procedures specified for shop work.
- H. Existing work: Remove and re-install or re-locate existing metal fabrications as required to complete the work. Drill, tap, or weld existing assemblies as required to complete the work and to attach existing work to new work.

3.03 PRODUCTS

- A. Anchors and Bolts:
Anchors and bolts shall be provided where necessary for fastening work in place. They shall be embedded in concrete and masonry as the work progresses. Sizes, kinds and spacing of anchors not indicated or specified shall be as necessary for their purpose.
- B. Steel:
Steel for the support of piping and appurtenances shall be provided to the details indicated and as necessary for the complete installation.
- C. Pipe Hangers and Miscellaneous Supports:
Pipe hangers and miscellaneous supports shall be provided as required.
- D. Miscellaneous Framing and Supports:
 - 1. Provide miscellaneous steel framing and supports which are not a part of structural steel framework, as required.
 - 2. Fabricate miscellaneous units to sizes, shapes and profiles shown or, if not shown, of required dimensions to receive work to be supported by framing. Except as otherwise shown, fabricate from structural steel shapes and plates and steel bars, of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.
 - 3. Equip units with integrally welded anchor straps for casting into poured concrete or building into masonry wherever required. Furnish concrete inserts if units must be installed after concrete is placed.

E. Pipe Rails

1. Pipe rails for exterior stairs, ramps, platforms, and landings shall be constructed of standard galvanized steel pipe unless noted otherwise. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.
3. Railing posts set in concrete shall be installed in pipe sleeves, securely anchored using non-shrink grout to minimum 4" depth. Inside dimensions of sleeve is to be not less than 1/2 inch greater than the outside dimensions of post with metal plate forming bottom closure.
4. Railings shall meet all state building, fire and accessibility code requirements for height, openings, end extensions, etc.
5. Rails attached to walls shall be anchored securely and all ends shall return to terminate against wall. Close ends of returns with prefabricated end fittings unless clearance between end of rail and wall is 1/4 inch or less.
6. Provide metal materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
7. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.
8. Fabrication
 - a. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
 - b. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
 - c. Form work true to line and level with accurate angles and surfaces.
 - d. Cut, reinforce, drill, and tap as indicated to receive any finish hardware, screws, and similar items.
 - e. Connections: Fabricate railings with welded connections unless otherwise indicated.
 - f. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove flux immediately.
 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces. Grind butt welds flush and grind or fill exposed fillet welds to smooth profile. All exposed welds are to be continuous, level and smooth to an Architectural quality finish to the satisfaction of the Architect.
 - g. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

9. Finishes
 - a. All exterior railings and associated components are to be galvanized, primed & painted in accordance with Specification Section 09 91 00 – Painting.
 - b. All interior railings and its associated components are to be primed and painted in accordance with Specification Section 09 91 00 – Painting.

F. Metal Ladder

1. Ladder for elevator pit.
2. Pipe components for ladders shall be constructed of standard steel pipe unless noted otherwise.
3. Ladders shall meet all state code and OSHA requirements.
4. Pipe components attached to walls shall be anchored securely.
5. Provide metal materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
6. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.
7. Fabrication
 - a. Assemble ladder in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
 - b. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
 - c. Form work true to line and level with accurate angles and surfaces.
 - d. Cut, reinforce, drill, and tap as indicated to receive any finish hardware, screws, and similar items.
 - e. Connections: Fabricate ladder with welded connections unless otherwise indicated.
 - f. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - g. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - h. Obtain fusion without undercut or overlap.
 - i. Remove flux immediately.
 - j. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces. Grind butt welds flush and grind or fill exposed fillet welds to smooth profile. All exposed welds are to be continuous, level and smooth to the satisfaction of the Architect.
 - k. Bend members in jigs to produce uniform curvature for each configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
8. Finishes: The ladder and its associated components are to be primed and painted in accordance with Specification Section 09 91 00 – Painting.

G. Wrought Iron Railing

1. Paint all metal components in accordance to Section 09 91 00 - Paint color shall be satin black.
2. Railings shall meet all state building, fire and accessibility code requirements for height, openings, end extensions, etc.

3.04 REPAIR OF ZINC COATINGS:

- A. All zinc coatings that have been damaged in handling or transporting or in welding, riveting or bolting shall be repaired by the application of a thick paste made from galvanizing repair compound conforming to Federal Specification 0-G-93 and water. Areas to be repaired shall be cleaned thoroughly, including removal of slag on welds, before the paste is applied. Surfaces to be coated with paste shall be heated with a torch so that all metallics in the paste will be melted when applied to the heated surfaces. Extreme care shall be taken to see that adjacent zinc-coated surfaces are not damaged by torch. Molten metal shall spread uniformly over all surfaces to be coated and the excess metal wiped off.

3.05 FIELD PAINTING

- A. Specified as scheduled under Section 09 91 00 - Painting.

3.06 DISSIMILAR MATERIAL

- A. Where aluminum comes in contact with metals other than stainless steel, zinc, white bronze or other metals compatible with aluminum, then those surfaces shall be kept from direct contact by painting the dissimilar metal with a coating of heavy-bodied bituminous paint, a good quality caulking placed between the metals, non-absorptive tape or gasket.

END OF SECTION

SECTION 06 20 10

CARPENTRY AND MILLWORK

PART 1 - GENERAL

1.01 SUMMARY

- A. Related Documents:
The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.02 SECTION INCLUDES

- A. All labor and materials, equipment and installation of all work required to complete the construction and installation of all work required to this trade as indicated on the drawings and as herein specified.

1.03 RELATED SECTIONS

- A. Section 07 31 13 - Architectural Roof Shingles
- B. Section 09 91 00 – Painting
- C. Section 12 32 16 – Plastic Laminate Casework

1.04 REFERENCES

- A. American Plywood Association
- B. American Woodwork Institute

1.05 SUBMITTALS

- A. Submit shop drawings, product data and samples under provisions of Section 01 33 00.

1.06 QUALITY ASSURANCE

- A. Work shall comply with all local and state building and fire codes.
- B. Material and workmanship of all woodwork shall conform to the Premium grade requirements of the AWI Quality Standards.

1.07 REGULATORY REQUIREMENTS

- A. All materials are to conform to the minimum requirements of the State Building Code or as indicated in this specification, whichever is stronger or stricter.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
- B. Protect all materials from weather. Do not store in damp or wet areas. Stack lumber and plywood, and provide air circulation within stacks.

1.09 FIELD MEASUREMENTS

- A. Verify all field dimensions at the site prior to fabrication.

1.10 COORDINATION

- A. Coordinate work with other trades and under provisions of Section 01 31 00.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Framing Lumber
 - 1. Moisture content when delivered to the project shall not exceed 19 percent.
 - 2. Wood studs, blocking, bridging, nailing pieces, shall be Douglas Fir, Coast Region construction grade "J" and "P" or Southern Pine No. 1. All structural load bearing lumber shall be of quality to provide 1200 psi units fiber stress.
 - 3. Mark of treating company certifying type of treatment applied on fire retardant treated and pressure preservative treated lumber.
- B. Plywood shall be of the types and grades listed below:
 - 1. Exposed exterior plywood to be American Plywood Association A-C, Group 1,
 - 2. Exposed interior plywood to be American Plywood Association A-C, Group 1,
 - 3. Each panel of plywood shall be identified with a stamp as to type, grade and species by the grade trademark of the American Plywood Association.
Mark of treating company certifying type of treatment applied on fire retardant treated and pressure preservative treated plywood.
- C. Interior and Exterior Woodwork for Paint Finish
 - 1. Quality: Wood shall be free from knots, pitch or sap streaks, molded.
 - 2. Species: Wood shall be clear, kiln-dried close-grained hardwood .
- D. Plastic Laminate
 - 1. Manufacturers
 - a. Subject to compliance with requirements of this Specification Section, provide products listed herein from one of the following:
 - 1. Wilsonart Corporation
 - 2. Formica

3. Arborite
 - b. Substitutions: Under provisions of Section 01 60 00.
 2. Counter tops and backsplashes:
 - a. Standard High Pressure Decorative Laminate - General Purpose Type: Wilsonart Type 107, having the following physical characteristics:
 1. Sheet thickness: 0.048 inch nominal.
 2. Exceeding performance requirements of NEMA LD 3 current revision Grade HGS.
 3. Surface burning characteristics in accordance with ASTM E 84; unbonded.
 3. Laminate on shelving and other surfaces:
 - a. Standard High Pressure Decorative Laminate - Vertical Surface Type: Wilsonart Type 335, having the following physical characteristics:
 1. Sheet thickness: 0.028 inch nominal.
 2. Exceeding performance requirements of NEMA LD 3 current revision Grade VGS and VGP.
 3. Surface burning characteristics in accordance with ASTM E 84; unbonded.
 4. Matte finish, unless otherwise indicated, verify with Owner.
 5. Colors as selected by Owner from standard manufacturer's colors and patterns.
 6. Adhesives: Do not use adhesives that contain urea formaldehyde.
- E. Counter Brackets – Surface Mounted
1. Manufacturer: Rangine Corporation
 2. Surface mounted Rakks models as follows:
 3. Provide the following models and sizes as required:
 - EH-1209: 12" x 9" (12" vertical) on counters between 11" and 13" deep
 - EH-1212: 12" x 12" on counters between 13 1/2" and 18" deep
 - EH-1818: 18" x 18" on counters between 18 1/2" and 25" deep
 - EH-1824: 18" x 24" (18" vertical) on counters between 25 1/2" to 30" deep
 4. Finish to be selected by Owner from manufacturer's standard colors.
 5. Fasteners in wall are to match color of bracket.
 6. Provide wood blocking in stud walls as required.
 7. Max distance between standards to be 48 inches.
 8. Size bracket as required to coordinate with shelf depth.
- F. Counter Brackets – In-wall Mounted
1. Manufacturer: Rangine Corporation
 2. Inside wall mount Rakks models as follows:
 3. Provide the following models and sizes as required:
 - EH-1209FM: 12" x 11" (12" vertical) on counters between 11" and 13" deep
 - EH-1212FM: 12" x 14" on counters between 13 1/2" and 18" deep
 - EH-1818FM: 18" x 20" on counters between 18 1/2" and 25" deep
 - EH-1824FM: 18" x 26" (18" vertical) on counters between 25 1/2" to 30" deep
 4. Finish to be selected by Owner from manufacturer's standard colors.
 5. Brackets are attached to the side of studs prior to the application of the gypsum board.
 6. Provide wood blocking inside the stud of metal stud walls to provide solid support for the

- fasteners. Provide through bolts through the wood stud per manufacturer's instructions.
Patch gap around opening through gypsum board for a finished installation.
7. Max distance between standards to be 32 inches.
 8. Size bracket as required to coordinate with shelf depth.
- G. Shelving Brackets and Standards – Adjustable
1. Manufacturer: Knap & Vogt (K&V)
 2. 187LL series brackets and 87 series standards.
 3. Finish to be selected by Owner from manufacturer's standard colors.
 4. Provide wood blocking in stud walls as required.
 5. Max distance between standards to be 32 inches.
 6. Size bracket as required to coordinate with shelf depth.
- H. Closet rod and bracket: Manufacturer to be Knap & Vogt
- a. Closet shelf/pole brackets to be Model 1195 with white or cream color finish.
 - b. Closet rod to be Model 750-5 heavy duty round steel with chrome finish, 1 5/16 inch outside diameter, 0.075 inch wall thickness.
 - c. Wall mount flanges to be Model 764 with chrome finish
 - d. Provide matching end cap at all exposed closet rod ends as necessary.
 - e. Provide support at maximum 48 inches o.c.
 - f. Provide painted 1 x 12 wood shelf full width of closet.
- I. Plastic Countertop Grommets
- a. All grommets to be Model XG3, 3" Diameter, Flip-Top Grommet Set as Manufactured by Doug Mockett & Company
 - b. Grommet cap and liner set includes liner and cap with cord slot. Cap features Flip-Top tab which closes and covers cord slot when grommet is not in use
 - c. Color selected by Owner from manufacturer's standard colors.

PART 3 - EXECUTION

3.01 CONSTRUCTION

- A. Rough Carpentry
1. General: Carefully lay out, cut, fit and rout all framing, blocking and other items of carpentry in such a manner as to minimize shrinkage and insure stability. Perform all carpentry work required for building in work of other trades and work to the details indicated and as required by field conditions.
 2. NOTE: The Carpenter is responsible to fill all nail holes in finish carpentry.
 3. Provide fire retardant treated wood products as shown and as follows:
At exposed or semi-exposed wood in fire rated assemblies and in spaces having limited flame spreads for exposed combustibles. Where blocking is concealed in fire rated assemblies and all areas as required by code.
 4. Includes: Rough carpentry shall consist of the installation of sleepers, blocking, nailers, curb nailers, furring, joists, studding, rafters, stringers, centers, rough flooring, grounds, screeds, and such other items of rough carpentry as may be required for proper construction and to complete the work. Absence of illustration, detail or specification will not relieve the Design/Builder from responsibility or carrying out the work.

5. Lumber and other rough work shall be properly framed closely fitted, accurately set to the required lines and levels and rigidly secured in place.
Joists and rough stair stringers shall be set with the crown edge up, and the bottom edges shall be free from pronounced defects.
Leveling of sills, etc., on masonry or concrete shall be done, as required and grouted with cement mortar.
Studs and joists shall be sized to give true surfaces for finish.
Nailing and spiking shall be done in a thorough manner with nails of ample size, spikes larger than 20d being used where practicable.
6. Mechanical equipment clearances: Members shall be framed to allow for passage of pipes or ducts as required to avoid cutting of structural members. No members shall be cut, notched or bored for the passage of such pipes without permission of the Owner, and all members damaged by cutting shall be reinforced as directed by the Owner.
7. Pressure preservative treated lumber: All wood in direct contact with concrete, masonry, soil or gravel shall be pressure preservative treated wood, 0.40 lbs./cu.ft., ground contact grade with a 40 year warranty. Wood shall be free from large or loose knots, shakes, checks and warpage. Apply two coats of same preservative used in original treatment to all sawed or cut surfaces of treated lumber, in accordance with AWPA M4.
8. Studs: Studs shall be no less than 2"x4", spaced not over 16 inches on center, unless otherwise shown. Studs shall be doubled around all openings. Corners shall be thoroughly spiked together and made solid. All bearing partitions shall be provided with double top and bottom plates. Partitions shall have one row of horizontal bridging for the full width of studding, cut in and securely nailed. Studs shall be framed as required for the proper installation of trim, plumbing, and other work to be concealed. Studding shall be installed for the support of all fixtures and accessories as required.
9. Furring and Grounds: Shall be minimum 1" x 3" strips, spaced maximum 16" on center and continuous at all vertical edges of framed openings. Furring shall be secured to concrete, brick or masonry units by power driven fasteners. Face of furring and grounds shall form a true, even plane for installation of materials thereon. Species shall be Fir or Southern Pine, at Design/Builder's option.
10. Joists: All joists shall have bearings of not less than 4 inches. Where possible, joists shall be lapped and spiked together at bearings and spiked to studs where the same occurs. Openings shall be framed with headers and trimmers. Headers carrying more than one tail-joist shall be tripled. Metal double cross bridging shall be provided at the center of span of all floor and ceiling joists.
11. Subfloor is to be 7/8" Weyerhaeuser Edge Gold oriented strand board floor panels or equal with tongue and groove edge. Glue and nail the flooring to joists in accordance with manufacturer's instructions. Use solvent based glue. Leave 1/8" gap along all ends and edges to allow for expansion.
12. Trim
 - a. Trim shall be mitered and jointing shall be tight and formed to conceal shrinkage. All mortise, tongue-and-groove and shiplap joints shall be set in neutral white caulking compound. Interior woodwork shall be back primed and painted before installation.
 - b. Interior trim shall be milled, fabricated and erected as shown on the drawings. All finishes shall be machine-sanded at the mill and sand-papered and primed at the job.
Wood used for trim is to be any close-grained hardwood.

All interior trim including base, chair rails, ceiling mouldings, casings, window stools and aprons shall be of stock designs. All joints shall be made in an approved manner to conceal shrinkage and shall be tight, straight, plumb and level, in perfect alignment and closely fitted. Joints shall be secured with finish nails set for putty stopping. Window and door trim shall be in single lengths. Base shall be in long lengths. Mouldings shall be mitered at corners and coped at angles. These joints shall be made at the mill.

13. Plastic Laminate Countertops and Backsplash
 - a. Countertop in dry areas shall consist of a layer of plastic laminate adhered to 3/4" medium density fiberboard (MDF) with backer sheet.
 - b. Countertop in wet areas shall consist of a layer of plastic laminate adhered to 3/4" "Medex" or equal, water resistant medium density fiberboard (MDF) with backer sheet.
 - c. Provide backsplash where abutting wall.
 - d. Plastic laminate adhesive shall be selected in accordance with manufacturer's recommendations for specific substrate used.
 - e. Front edge and exposed side edges of countertop are to be 3 mm thick PVC unless noted otherwise on drawings. Solid, high-impact, purified, color-thru, acid resistant, machine-applied with hot melt adhesives, trimmed, inside/outside length-radiused for uniform appearance, buffed and corner-radiused for consistent design. Color and pattern of PVC is to match the color and pattern of the adjacent plastic laminate countertop & splash. Submit sample to be approved by Owner.
14. Plastic Laminate Shelving:

Plastic laminate is to be adhered to a MDF substrate, 3/4" thick. Laminate is to be on all six sides.
15. Temporary Enclosures and Protection: Temporary enclosures of doors, windows and other exterior openings shall be provided when necessary to meet conditions specified. Maintain in good repair and remove when no longer required. Door and window frames shall be protected from traffic and from mortar drippings.

B. Blocking

1. Blocking layout and size: Continuous and solid, fire retardant 3/4 inch plywood or fire retardant 2x4 or larger where additional support is required.
2. Provide blocking at a minimum in locations as follows:
 - a. Millwork attached to walls or ceilings.
 - b. All standing and running trim
 - c. Equipment attached to walls or ceilings.
 - d. At grab bars.
 - e. Toilet Room accessories.
 - f. Handrail brackets.
 - g. Wall hung lavatories.
 - h. At cabinets and casework.
 - i. At shelving and counter brackets.
 - j. Closet rod/shelf brackets.
 - k. At all door wall stops.
 - l. At window shades, blinds or drapes brackets or hardware and FF&E work.
 - m. Mid points of all walls.
 - n. Between joists at all points requiring support.

- o. As required to support light fixtures.
 - p. At exterior items or fixtures mounted or attached where insulating sheathing, or cement, vinyl, PVC, or wood-lapped board siding or trim is used.
 - q. Set in between studs parallel to and flush to top stair carriages.
 - r. Sheathing and flooring unsupported butt joints
 - 3. Attach blocking as follows:
 - a. In metal stud partitions: Screw attach through stud flanges.
 - b. At masonry: With oval head toggle bolts and washers or with epoxy tube and sleeve systems.
 - c. At concrete: With expansion shield bolts.
 - d. At steel: With flat head bolts/nuts or approved power actuated fasteners.
 - C. Provide wood firestopping as follows:
 - 1. At ceiling lines and at 8'-0" height if ceiling is higher.
 - 2. As required to close of all framing spaces connecting floors.
 - 3. As required by code.
 - D. Plywood backer panels:
 - 1. Material: APA C-D Plugged Exposure 1 with exterior glue
 - 2. Fire retardant.
 - 3. Coatings: Fire retardant paint, six sides, applied before installation.
 - 4. Coating color: As directed, if not, black.
 - 5. Thickness: As indicated, if not, 3/4 inch.
 - 6. Provide and install fire retardant plywood backer panels for surface mounted electric panel boards, meter mounts, protection cabinets, motor control panels and the like. Boards shall be rigidly built and securely fastened to wood-furred strapping at walls in approved manner. Provide plywood backings for Telephone and Protection (Security) panels.
 - E. Construction Hardware
 - 1. Furnish and install all bolts, nuts, expansion shields, lag screws, toggle bolts, wood screws, nails, flat cap metal nailing discs, staples, power driven anchors and other rough hardware as required.
 - 2. Rough hardware items shall be of appropriate type and proper capacity and size as required for each specific application.
 - 3. All fasteners used on exterior work shall be hot dip galvanized or stainless steel.
 - 4. Concrete and masonry anchors: Where anchors are not included in concrete or masonry construction sections, anchors shall be galvanized machine screws or bolts with standard expansion-shield type concrete anchors, Phillips "Red Head" Masonry Anchors or approved equal, of sizes and types as required.
 - 5. Fasteners used at treated wood: Fasteners meeting manufacturers approval and requirements if not listed use stainless steel.

3.02 CLEANING

- A. Clean work under provisions of 01 70 00.

3.03 PROTECTION OF FINISHED WORK

- A. Protect finished work under provisions of Section 01 70 00.

END OF SECTION

SECTION 07 11 13

BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Clean, patch and prepare surfaces to receive dampproofing specified herein.
- B. Provide dampproofing at perimeter of elevator pit foundation walls.

1.02 SUBMITTALS

- A. Submit product data and samples in accordance with Section 01 33 00.
- B. Submit manufacturer's surface preparation and installation instructions.

1.03 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply dampproofing on damp or frozen surfaces.
- B. Ensure temperatures are maintained at a minimum of 40 degrees F for 24 hours before application and continuously until dampproofing has cured.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Dampproofing: BASF Corporation– Masterseal 614
- B. Other acceptable manufacturers offering equivalent products.
 - 1. Karnak 920AF Fibered Emulsion Mastic
- C. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS

- A. Dampproofing System: Heavy Bodied, non-sag coating reinforced with long fibers; trowel application.

PART 3 - EXECUTION

3.01 SURFACE PREPARATION FOR DAMPPROOFING

- A. Clean and prepare surface to receive dampproofing in accordance with manufacturer's recommendations.
- B. Ensure surfaces are firm and free from frost, loose particles, cracks, pits, rough projections, grease, oil and other foreign matter detrimental to adhesion and monolithic application.

3.02 APPLICATION OF DAMPPROOFING

- A. Apply with brush or trowel in one coat, over dry, cured surface, to a dry film thickness of 1/16 inch.
- B. Protect adjacent surfaces from staining or migrating of mastic.

END OF SECTION

SECTION 07 26 16

UNDER-SLAB VAPOR BARRIER

PART 1 – GENERAL

1.01 SUMMARY

- A. Products Supplied Under This Section
 - 1. Vapor Barrier, seam tape, pipe boots, detail strip for installation under concrete slabs.

1.02 RELATED SECTIONS

- A. Division 3 - Concrete Construction

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM E 1745 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs
 - 2. ASTM E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs
 - 3. ASTM E 1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs
- B. American Concrete Institute (ACI)
 - 1. ACI 302.1R Vapor Barrier Component (plastic membrane).

1.04 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Quality Control / Assurance
 - 1. Independent laboratory test results showing compliance with ASTM & ACI Standards.
 - 2. Manufacturer's samples, literature
 - 3. Manufacturer's installation instructions for placement, seaming and pipe boot installation

PART 2 – PRODUCTS

2.01 MATERIALS

- A. 15 mil Vapor Barrier:
Extremely low permeance vapor barrier for critically sensitive, low permeance floor coverings.
 - 1. Vapor Barrier must have the following qualities
 - a. Thickness of Barrier (plastic) ACI 302.1R Not less than 15 mils
 - b. Water Vapor Barrier ASTM E-1745 Meets or exceeds Class A
 - c. Water Vapor Permeance ASTM F 1249 0.0086 Perms
 - d. Water Vapor Transmission Rate ASTM F 1249 0.0036
 - e. Puncture Resistance ASTM D 1709 2266 grams
 - f. Tensile Strength ASTM D 882 70.6 lbf/in

1. Acceptable 15 mil Vapor Barriers
 - a. Stego Wrap (15 mil) Vapor Barrier by Stego Industries LLC
 - b. Griffolyn 15-mil Green by Reef Industries, Inc.
 - c. Perminator 15-mil by W.R. Meadows

2.02 ACCESSORIES

- A. Seam Tape: High Density Polyethylene Tape with pressure sensitive adhesive. Minimum width 4 inches.
- B. Pipe Boots: Construct pipe boots from vapor barrier material and pressure sensitive tape per manufacturer's instructions around all penetrations through the vapor barrier.
- C. Perimeter / edge seal: Provide double sided tack tape to seal the vapor barrier around the entire perimeter wall or footing/grade beam. Ensure the concrete is clean and dry prior to adhering tape.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Ensure that subsoil is approved by architect
 1. Level and tamp or roll aggregate, sand or tamped earth base.
- B. Design/Builder shall use a screeding system that does not puncture the vapor barrier.

3.02 INSTALLATION

- A. Install Vapor Barrier:
 1. Installation shall be in accordance with manufacturer's instructions and ASTM E 1643–98.
 - a. Install a vapor barrier as specified herein under all new concrete slabs-on-grade.
 - b. Unroll Vapor Barrier with the longest dimension parallel with the direction of the pour.
 - c. Lap Vapor Barrier over footings and seal to foundation walls using tack tape.
 - d. Overlap joints 6 inches and seal with manufacturer's seal tape.
 - e. Seal all penetrations (including pipes) with manufacturer's pipe boot.
 - f. No penetration of the vapor barrier is allowed except for reinforcing steel and permanent utilities.
 - g. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 6 inches and taping all four sides with tape.

3.03 CLEANING

- A. Clean under provisions of Section 01 70 00.

END OF SECTION

SECTION 07 31 13

ARCHITECTURAL ROOF SHINGLES

PART 1 - GENERAL

1.01 SUMMARY

- A. Related Documents:
The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.01 SECTION INCLUDES

- A. Granular surfaced shingle roofing.
- B. Moisture shedding underlayment, eave, valley and ridge.
- C. Associated metal flashings.
- D. Snow Guards

1.02 RELATED SECTIONS

- A. Section 07 62 11 - Sheet metal flashing
- B. Section 07 71 23 - Gutters and Downspouts
- C. Section 07 92 13 - Joint Sealants

1.03 REFERENCES

- A. ANSI/ASTM B209 - Aluminum Alloy Sheet and Plate.
- B. ANSI/ASTM D226 - Roofing and waterproofing
- C. ANSI/ASTM E108 - Standard Test Method for Fire Resistance.
- D. ANSI/ASTM D1922 - Propagation tear resistance of plastic film and thin sheeting by pendulum method.
- E. ANSI/ASTM D3018 - Standard Specification for class A Asphalt Shingles.
- F. ANSI/ASTM D3161 - Standard Test Method for Wind Resistance of Asphalt Shingles (Organic or Fiberglass)
- G. ANSI/ASTM D3462 - Standard Specification for Asphalt Shingles. (Fiberglass)
- H. ANSI/ASTM D2822 - Asphalt Roof Cement.

- I. SMACNA MANUAL - Architectural Sheet Metal Manual.

1.04 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Indicate metal flashings, jointing methods and locations, fastening methods and locations, and installation details.
- C. Product Data: Provide data indicating material characteristics, performance criteria and limitations.
- D. Manufacturer's Certificate: Certify that roof shingles meet or exceed:
 - 1. Code and insurance requirements
 - 2. ASTM E108 Class A Fire Resistance
 - 3. ASTM D3161 Wind Resistance
 - 4. ASTM D1922 Tear Strength
 - 5. ASTM D3018 Type 1
 - 6. ASTM D3462 Standard for Asphalt Shingles. (Must have Independent certification)
 - 7. Minimum weight of 300 lb. per square
- E. Manufacturer's Installation Instructions
- F. Samples: Submit samples indicating the full color range from the manufacturer's standard colors.

1.05 QUALITY ASSURANCE

- A. Perform this work in accordance with the Asphalt Roofing Manufacturers Association Residential Asphalt Roofing Manual. Copies may be obtained at the:
Asphalt Roofing Manufacturers Assoc.
- B. Maintain one copy on site at all times.
- C. Manufacturer: Company specializing in manufacturing the products specified in this section with a minimum of five years of documented experience.
- D. Installer: Company specializing in performing the work of this section with a minimum of five years of verifiable documented experience. Installer must be a "Certainteed Master Shingle Applicator."
- E. Use only trained workmen skilled in the installation of this type of work. The foreman shall have a minimum of five years of verifiable documented experience.
- F. Upon request furnish the name, location and contact person of previous roofing installations to the Owner.

1.06 REGULATORY REQUIREMENTS

- A. Conform to Code for ASTM D3018 Class A, UL 790 Fire resistance and UL 58 Wind Uplift for shingle types specified.
- B. Conform to Code for ASTM D3462 Tear resistance.
- C. Conform to insurance requirements identified by owner or its representative.
- D. Provide certificate of compliance from ASTM and UL indicating approval of specified products.
- E. Submit evidence of applicable insurance requirements.
- F. Conform to all applicable Federal, State and local codes and laws.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products under the manufacturer's recommendation and under provisions of Section 01 60 00.
- B. Deliver materials in their original, unopened containers, dry, undamaged, sealed and labels intact.
- C. Stand roll materials on end.
- D. Store other materials flat, elevated from ground or roof deck, protected with waterproof covers as necessary to keep the materials dry.
- E. Protect materials from damage. Do not use materials damaged in handling or storage. Replace damaged materials at no additional cost to the Owner.
- F. When storing materials on the roof, and during application, the roofing Design/Builder shall ensure that overloading of the deck and structure does not occur.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Do not install roofing materials during inclement weather.
- B. Do not install ice and water protection and shingles when ambient temperature is below 50 degrees Fahrenheit.
- C. Do not install roofing materials to damp or frozen deck.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during the same day.
- E. Any damaged or deteriorated deck or flashing substrate which is discovered shall be promptly reported to the Owner or their designated representative.

1.09 WARRANTY

- A. Upon completion of the roof system and after passing a final inspection performed by the roofing manufacturer and the owners representative. The manufacturer's Warranty will be furnished for the work of this section as follows:
 - 1. ROOF SHINGLE: 50 Year warranty
- B. Warranty Extension: Manufacturer of shingle will provide a Surestart warranty to cover labor and materials in the event of a materials defect during the first ten (10) years after completion of application of shingles.
- C. Provide fifteen (15) year, 110 mph wind-resistance warranty
- D. Provide 15-year StreakFighter™ warranty.
- E. Provide 15 year Algae Resistant warranty.
- F. Ridge Vents: Provide the manufacturer's standard warranty.

1.10 EXTRA MATERIALS

- A. Furnish under provisions of Section 01 78 00.
- B. Provide two bundles of shingles packaged as required for long term storage.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements of this Specification Section, provide products listed herein from one of the following:
 - 1. CertainTeed Corporation
 - 2. Elk Premium Building Products
 - 3. GAF Materials Corporation
- B. Basis of Design: CertainTeed Corporation: Landmark Pro AR
- C. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS

A. ROOF SHINGLES

1. Roof shingle shall conform to ASTM D 3018 Type I – Self-Sealing; UL Certification of ASTM D 3462, ASTM D 3161 Class "F" Wind Resistance and UL Class A Fire Resistance; glass fiber mat base; ceramically colored algae resistant granules across entire face of the shingle; two-piece laminated shingle.
2. Color selected by Owner from manufacturer's standard colors.

B. DRIP EDGE:

1. Aluminum, ASTM B209, pre-formed, 1/2 inch extension for drip break back for 1 inch vertical fascia, minimum 3 inch railing on roof surface.
2. Color selected by Owner from manufacturer's standard colors.

C. RAKE EDGE:

1. Aluminum, ASTM B209, pre-formed, 1 inch vertical fascia, minimum 3 inch railing on roof surface.
2. Color selected by Owner from manufacturer's standard colors.

D. RIDGE VENTS

1. ShingleVent II, Model SHFV manufactured by AIR VENT Inc. or equal.
 - a. Copolymer shingle-over continuous ridge vent, 18 square inches of net free area per linear foot.
 - b. Install shingles to cap the ridge vent.

E. CONTINUOUS SOFFIT VENT

1. Continuous aluminum soffit vent manufactured by AIR VENT Inc. or equal.
 - a. Louvered aluminum, 2" wide, 9 square inches of net free area per linear foot.
 - b. Color selected by Owner from manufacturer's standard colors.

F. SNOW GUARDS

1. Manufacturer: Basis of design: Berger Building Products, Inc.
 - a. Substitutions: Under provisions of Section 01 60 00.
2. Product Description: Snow guard system for asphalt shingled roofs consists of snow guard brackets assembled with (2) brass bolts, nuts and washers, riveted to a 2" x 12" base plate and two brass tubes fastened to brackets. Brackets are to be installed at 24 inches o.c. and the snow guard system installed a minimum of one foot inside from the exterior face of the building's exterior wall.
 - a. Snow Guard Bracket (FR124BRZ - Mullane Fitrite #124 Mini-Protector Fence Bracket for 2 pipes.)
 1. Castings: Cast Bronze ASTM B 584 Alloy C84400
 2. Base Plate: (0.125" X 2.0" X 12.0"), Half Hard Brass, CDA 260, Rivets (4), 9/16" Flat Head Copper.
 - b. Tubing: Brass: (RBP800-12), Red Brass, 0.50" ID, ASTM B-43 AND ALLOY 230
 - c. Couplings: Brass (RBCON800), Red Brass, 0.50" ID, ASTM B-43 AND ALLOY 230

- d. End Caps: Brass (RBPEC800), Red Brass, 0.50" ID, ASTM B-43 AND ALLOY 230
- e. Fasteners to be compatible with chosen roof application and shall be through-bolted with a backer plate on the underside of the roof sheathing. Minimum three (3) fasteners per snow guard.
- f. Finishes to be mill finish.

G. SHEET MATERIALS

- 1. Underlayment: DiamondDeck by CertainTeed, or equal, is a synthetic polymer-based scrim-reinforced underlayment. Low-slope application minimum 2" per foot. Between slopes of 2" per foot up to 4" per foot apply two layers of DiamondDeck in "shingle-fashion" as described in the installation instructions.
- 2. Eave and valley protection (Ice and Water Shield): Winterguard by CertainTeed or equal: A sheet barrier of self adhering, rubberized asphalt membrane shingle underlayment having a high traction surface and internal reinforcement. The material must have a warranty equal or greater in duration to that of the shingles being applied.

H. GUTTERS AND DOWNSPOUTS: See specification section 07 71 23.

2.03 ACCESSORIES

- A. Nails: Standard round wire type, (hot dipped zinc coated steel) with a minimum 7/16 head diameter and 0.104 inch shank diameter, (minimum 7/8 inch long) or of sufficient length to penetrate through roof sheathing and into the substrate. (a minimum of 1/2 inch).
- B. Plastic Cement: ASTM D2822 asphalt type with mineral fiber components, free of toxic solvents and asbestos, capable of setting within 24 hours at temperature of 75 degrees F and 50% RH. #19 cold cement manufactured by Karnak.
- C. Lap Cement: Fiberated cutback asphalt type, recommended for use in application underlayment, free of toxic solvents and asbestos: #16 double coverage cement manufactured by Karnak.

2.05 FLASHING FABRICATION

- A. Form flashings to protect roofing materials from physical damage and to shed water
- B. Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.
- C. Hem exposed edges of flashings minimum 1/4 inch on underside.
- D. Apply bituminous paint on concealed surfaces of flashings.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. A survey of existing interior building conditions shall be made by both the Design/Builder and the owners representative prior to the start of construction operations. All defects shall be noted, and the Design/Builder shall prepare a list of the same in writing. Said list shall be given to the owner for his review and approval. If the Design/Builder does not submit a list to the owner it will be assumed that there are no defects in the building and that the Design/Builder take full responsibility for the interior of the building during the work project.
- B. Any damages caused by the Design/Builder's operations shall be repaired to the satisfaction of the owner at the Design/Builder's expense.
- C. The roofing Design/Builder shall carefully examine the roof area in regards to dimensions, type of and quantities of existing roofing systems and type of substrate and conditions that may affect proper execution of the work. Any variations shall be reported to the owner's representative and the Owner prior to the bid. "No claims for extra costs shall be allowed because of lack of full knowledge of existing conditions".
- D. Verify existing site conditions.
- E. Verify that roof openings, curbs, pipes, sleeves, ducts and vents through roof are solidly set, and wood, cant strips, wood nailing strips, and reglets are properly set and in place.
- F. Beginning of roof project means installer accepts existing conditions.

3.02 PROTECTION

- A. Schedule and execute all work without exposing the building interior to the effects of inclement weather. Protect the existing building, contents, and its inhabitants against all risks associated with this work.
- B. Provide suitable barricades to protect the general public.

3.03 PREPARATION

- A. Remove existing roofing system completely down to existing roof deck.
- B. Verify deck is clean and smooth, free of depressions, waves, or projections.
- C. Fill Knot holes and surface cracks with a latex filler at areas of bonded eave protection.
- D. Broom clean deck surfaces under eave protection and underlayment.

3.04 INSTALLATION - PROTECTIVE UNDERLAYMENT

- A. Place underlayment over entire roof surface and install in accordance with manufacturer's instructions. Nail in place. No staples allowed.
- B. Install protective underlayment perpendicular to slope of roof.
- C. Weather lap and seal watertight with plastic cement, items projecting through mounted on roof.

3.05 INSTALLATION - EAVE ICE DAM PROTECTION

- A. Place eave edge and gable edge metal flashings tight with fascia boards. Weather lap joints 2 inches and seal with plastic cement. Secure flange with nails spaced 2 on center.
- B. Apply the self adhering, rubberized asphalt membrane eave ice dam protection under roofing underlayment at all eaves in accordance with manufacturer's instructions.
- C. Extend eave ice dam protection membrane from the eave's edge up the slope a minimum of 3 feet inside the exterior wall line of the building.

3.06 INSTALLATION - VALLEY PROTECTION

- A. Place one layer of self adhering, rubberized asphalt membrane, centered over valleys extending 3 feet both sides of valley. Lap joints minimum of 6 inches. Valley protection shall be applied in accordance with manufacturer's instructions.
- B. Roof shingles are to be woven in valleys.

3.07 INSTALLATION - METAL FLASHINGS

- A. Weather lap joints a minimum of 2 inches and seal weather tight with plastic cement.
- B. Secure in place with nails at 2 inches on center. Conceal fastenings.
- C. Flash and seal work projecting through or mounted on roofing with plastic cement to make weather tight.
- D. Flashing metal shall be corrosion resistant.

3.08 INSTALLATION - RIDGE AND SOFFIT VENTS

- A. Install ridge and soffit vents in accordance with manufacturer's written instructions.

3.09 INSTALLATION - ROOF SHINGLES

- A. Install shingles in accordance with manufacturer's instructions.
- B. Place shingles in straight coursing pattern with weather exposure as recommended by the manufacturer to produce double thickness over entire roof area and as required to meet the warranty. Provide double course of shingles at eaves and gables.
- C. Project first course of shingles 3/4 inch beyond fascia boards.
- D. Extend shingles 1/2 inch beyond face of gable edge fascia boards.
- E. Cap Hips and ridges with individual shingles, maintaining 5 inch weather exposure. Place to avoid exposed nails.
- F. Install shingles using "Hurricane Nailing" of six nails per shingle.

3.10 INSTALLATION - SNOWGUARDS

- A. Install snow guards in accordance with manufacturer's written instructions.

3.11 FIELD QUALITY CONTROL

- A. Field inspection by manufacturer's representative will be performed under provisions of Section 01 43 00.
- B. Field inspections of the work will also be performed by the Owners designated representative.
- C. Repair or replace defaced or disfigured finishes caused by work of this section.

3.12 PROTECTION OF FINISHED WORK

- A. Protect finished work under provisions of Section 01 70 00.
- B. Do not permit traffic over finished roof surface.

END OF SECTION

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SECTION 07 53 50

ELASTOMERIC MEMBRANE ROOFING

(Alternate No. 6)

PART 1 - GENERAL

1.01 SUMMARY

- A. Related Documents:
The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.02 SECTION INCLUDES

- A. Replacement of roofing system at New Town Hall if Alternate No. 6 is accepted.
- B. Provide all labor, material, tools, equipment, and supervision necessary to complete the installation of an EPDM membrane Fully Adhered Roofing System including flashings, insulation, roof accessories and sheet metal associated with roofing system as specified herein in the location noted on the drawings in accordance with the manufacturer's most current specifications and details.
- C. The roofing Design/Builder shall be fully knowledgeable of all requirements of the contract documents and shall make themselves aware of all job site conditions that will affect their work.

1.03 RELATED WORK

- A. Section 01 22 00 - Alternates
- B. Section 07 31 13 - Architectural Roof Shingles
- C. Section 07 61 13 - Standing Seam Metal Roofing
- D. Section 07 62 11 - Sheet metal flashing
- E. Section 07 71 23 - Gutters and Downspouts
- F. Section 07 92 13 - Joint Sealants

1.04 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Prior to starting work, the roofing Design/Builder must submit the following:
 - 1. Shop drawings showing layout, details of construction and identification of materials. Drawings shall indicate outline of roof, location of drains, scuppers or gutters, profile of tapered insulation components, indication of insulation thickness, and the "R" value for the completed insulation system. Shop drawings shall comply with the drainage pattern required.
 - 2. Sample of the manufacturer's Membrane System Warranty.
 - 3. Submit a letter of certification from the manufacturer that certifies the roofing Contractor is authorized to install the manufacturer's roofing system and lists foremen who have received training from the manufacturer along with the dates training was received.
 - 4. Verify ASCE-7 wind uplift requirements and associated fastening patterns.
 - 5. Submit fastener pull-out test results.

- C. Manufacturer's installation instructions
- D. Submit manufacturer's material safety data (MSDS) for all components.
- E. Upon completion of the installed work, submit copies of the manufacturer's final inspection prior to the issuance of the manufacturer's warranty.

1.03 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
- B. Deliver materials to the job site in the manufacturer's original, unopened containers or wrappings with the manufacturer's name, brand name and installation instructions intact and legible. Deliver in sufficient quantity to permit work to continue without interruption.
- C. Comply with the manufacturer's written instructions for proper material storage.
 - 1. Store materials between 60°F and 80°F in dry areas protected from water and direct sunlight. If exposed to lower temperature, restore to 60°F minimum temperature 24 hours before using.
 - 2. Store materials containing solvents in dry, well ventilated spaces with proper fire and safety precautions. Keep lids on tight. Use before expiration of their shelf life.
- D. Insulation must be on pallets, off the ground, tightly covered with waterproof materials and protected from direct sunlight.
- E. Any materials which are found to be damaged shall be removed and replaced at the Design/Builder's expense.

1.04 WORK SEQUENCE

- A. Schedule and execute work to prevent leaks and excessive traffic on completed roof sections. Care should be exercised to provide protection for the interior of the building and to ensure water does not flow beneath any completed sections of the membrane system.
- B. Do not disrupt activities in occupied spaces.

1.05 PRE-INSTALLATION CONFERENCE

- A. The primary Design/Builder, subcontractors, the owner or the owner's representative shall conduct a pre-roofing conference one week before any work begins under provisions of Section 01 31 00, so all parties involved in the installation of the roofing system construction, or who may work on or through the roofing system, understand their obligations with respect to the roofing project and materials.
- B. Review installation procedures and coordination required with owner for related work.

1.06 SAFETY

- A. The roofing Design/Builder shall be responsible for all means and methods as they relate to safety and shall comply with all applicable local, state and federal requirements that are associated with safety. All related personnel shall be instructed daily to be mindful of the full time requirement to maintain a safe environment for the facility's occupants including staff, visitors, customers and the occurrence of the general public on or near the site. Provide a barricade around staging area as required to prevent entry.

1.07 QUALITY ASSURANCE

- A. The EPDM membrane roofing system must achieve UL Class A and ASCE-7 uplift requirements as per state code.
- B. The roofing system must meet the state requirements for the basic 140 mph wind speed zone.
- C. The manufacturer must have a minimum of 10 years experience in the manufacturing of vulcanized thermal set sheeting.
- D. Unless otherwise noted in this specification, the roofing contractor must strictly comply with the manufacturer's current specifications and details.
- E. The roofing system must be installed by an applicator authorized and trained by the manufacturer in compliance with shop drawings as approved by the manufacturer. The roofing applicator shall be thoroughly experienced and upon request be able to provide evidence of having at least five (5) years experience installing single-ply EPDM roofing systems and having installed at least one (1) roofing application or several similar systems of equal or greater size within one year.
- F. Provide adequate number of experienced workmen regularly engaged in this type of work who are skilled in the application techniques of the materials specified. Provide at least one thoroughly trained and experienced superintendent on the job at all times roofing work is in progress.
- G. There shall be no deviations made from this specification or the approved shop drawings without the prior written approval of the Owner.
- H. Upon completion of the installation, the applicator shall arrange for an inspection to be made by a non-sales technical representative of the membrane manufacturer in order to inspect and warranty the roofing system. Notify the Owner seventy-two (72) hours prior to the manufacturer's final inspection.
- I. **MANUFACTURER'S FIELD INSPECTIONS**
 - 1. During the project's construction, the Roofing System Manufacturer will provide the following:
 - a. Provide job site field inspections a minimum of three days a week.
 - b. Keep the Owner informed in a weekly written report with photo documentation as to the progress and quality of work observed.
 - c. Report to the Owner in writing any failure or refusal of the Design/Builder to correct unacceptable practices called to the Design/Builder's attention.

1.08 JOB CONDITIONS, CAUTIONS AND WARNINGS

- A. Material Safety Data Sheets (MSDS) must be on location at all times during the transportation, storage and application of materials.
- B. When positioning membrane sheets, exercise care to locate all field splices away from low spots and out of drain sumps. All field splices should be shingled to prevent bucking of water.
- C. When loading materials onto the roof, the Design/Builder must ensure that overloading and possible disturbance to the building structure does not occur.
- D. Proceed with roofing work only when weather conditions are in compliance with the manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with the manufacturer's requirements and recommendations.
- E. Proceed with work so new roofing materials are not subject to construction traffic. When necessary, newly roofed sections shall be protected and inspected upon completion for possible damage.
- F. Provide protection, such as 3/4 inch thick plywood, for all roof areas exposed to traffic during construction. Plywood must be smooth and free of fasteners and splinters.
- G. The surface on which the insulation or roofing membrane is to be applied shall be clean, smooth, dry, and free of projections or contaminants that would prevent proper application of or be incompatible with the new installation, such as fins, sharp edges, foreign materials, oil and grease.
- H. New roofing shall be complete and weathertight at the end of each work day.
- I. Contaminants such as grease, fats and oils shall not be allowed to come in direct contact with the roofing membrane.
- J. Conform to applicable codes for roof assembly fire hazard requirements.
- K. If the fastener for insulation installation listed in these specifications is not used, the Design/Builder is responsible to arrange for a pull test in the existing roof deck using the proposed fastener and meet all requirements noted herein.

1.09 WARRANTY

- A. Upon completion of the roof system installation and after passing a final inspection performed by the roofing manufacturer's representative and the Owner a warranty will be issued to the Owner under provisions of Section 01 78 00.
- B. Provide manufacturer's 20 year Golden Seal Total System Warranty covering both labor and material with no dollar limitation. Provide a warranty with a maximum peak gusts wind speed of not less than 120 miles per hour. Certification is required with bid submittal indicating the manufacturer has reviewed and agreed to such wind coverage.
- C. Pro-rated System Warranties shall not be accepted.

- D. Applicator/Roofing Contractor Warranty
The Applicator shall supply the Owner with a separate two (2) year workmanship warranty. In the event any work related to roofing, flashing, or metal is found to be within the Applicator warranty term, defective or otherwise not in accordance with the Contract Documents, the Applicator shall repair that defect at no cost to the Owner. The Applicator's warranty obligation shall run directly to the Owner.
- E. Thermal Performance Warranty: Warrants the thermal insulation "R" value of the system shall not diminish to less than 80% of the published "R" value from the time of purchase for a period of ten years.
- F. The warranty for the Carlisle SecurEdge 2000 Fascia system and the Kynar 500 finish is to be 20 years.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Carlisle SynTec Incorporated
- B. Other acceptable manufacturers offering equivalent products.
 - 1. Firestone "RubberGard EPDM MAX" 0.060 inch [60 mil] reinforced membrane.
 - 2. Johns Manville "JM EPDM R 60 MIL " 0.060 inch [60 mil] reinforced membrane.
- C. Basis of Design: Carlisle SynTec Incorporated

2.02 MEMBRANE

- A. Furnish Carlisle Sure-Tough black 0.060 inch thick reinforced EPDM (Ethylene, Propylene, Diene Terpolymer) in the largest sheet possible. The membrane shall conform to the minimum physical properties of ASTM D4637. When a 10 foot wide membrane is to be used, the membrane shall be manufactured in a single panel with no factory splices to reduce splice intersections.

2.03 INSULATION/UNDERLAYMENT

- A. Vapor Barrier: Carlisle VapAir Seal MD (or equal) self-adhering air and vapor barrier to be adhered to metal roof deck. Meets FM Approval Standard Class No. 4470. Provide manufacturer's recommended primers for application of barrier, manufactured free of asphalt compounds and designed for deck application matching project conditions.
- B. The polyisocyanurate insulation (Carlisle InsulBase or equal) shall have a minimum total thickness of 5.2 inches (two layers of 2.6") with a minimum "R" value of 30 meeting the requirements of ASTM C1289 using Long Term Thermal Resistance (LTTR) values. The minimum pitch of all roofing surfaces is to be 1/4" per foot. All crickets to be minimum 1/2" per foot pitch.
- C. Insulation shall be installed in multiple layers. The layers of insulation shall be adhered together and the base layer mechanically fastened to the metal roof deck in accordance with the manufacturer's published specifications.

- D. Roofs with sloped deck and flat stock insulation.
 - 1. This roof has a sloped metal deck. Mechanically fasten the flat stock 2.6", 20 psi polyisocyanurate insulation base layer to the metal deck and adhere the top layer of flat stock 2.6", 25 psi polyisocyanurate insulation to the base layer.
 - a. The crickets are to be 25 psi and adhered to the upper layer of insulation.
 - b. Provide tapered insulated feather strips 12 inches wide at edges of 1/2" tapered insulation board to eliminate gapping.

2.04 ADHESIVES AND CLEANERS

- A. Membrane Bonding Adhesive: Carlisle EPDM x-23 LVOC Bonding Adhesive
- B. 6" width Splice Tape and Primer: Sure-Seal SecurTAPE and low VOC HP-250 Primer.
- C. Cleaning Solvent: Sure-Seal Splice Cleaner
- D. External seam sealant: Sure-Seal Lap Sealant
- E. Sealer: Sure-Seal Pourable Sealer
- F. Insulation Adhesive: Carlisle FAST Dual-Cartridge Adhesive

2.05 FASTENERS AND PLATES

- A. HP-Xtra fastener for attachment to steel decks.
(300 lb minimum pull out resistance required, 1" minimum deck penetration)
- B. Insulation Fastening Plates: a 3 inch diameter FM approved metal plate used for insulation attachment in conjunction with HP Fasteners.
- C. Seam Fastening Plates: a 2 inch diameter FM approved metal plate used in conjunction with RUSS or with EPDM membrane for membrane securement.
- D. RUSS (Reinforced Universal Securement Strip): a 6 or 9 inch wide, 100 foot long strip of Sure-Seal reinforced EPDM membrane.

2.06 METAL EDGING AND MEMBRANE TERMINATIONS

- A. Carlisle SecurEdge 2000 Fascia System: Fascia Model AF-40 (4" high).
A metal fascia system with a 0.050 inch thick aluminum fascia cover snapped onto a heavy duty, continuous, extruded aluminum retainer cleat anchor bar. Retainer cleat is to be fastened to blocking with #9 x 2" stainless steel fasteners at 12 inches on center.
Metal fascia to have a Kynar 500 finish meeting AAMA 2605.
Color to be selected by the Owner from the manufacturer's standard colors.
Provide non-curing sealant between horizontal portion of cleat and top surface of roof membrane.
- B. Sure-Seal Termination Bar: a 1 inch wide and .098 inch thick extruded aluminum bar pre-punched 6 inches on center; incorporates a sealant ledge to support Lap Sealant and provide increased stability for membrane terminations.

- C. Provide pre-fabricated aluminum fascia mounted scupper sumps with downspout in locations shown on drawings. Metal fascia to have a Kynar 500 finish meeting AAMA 2605. Color to be selected by the Owner from the manufacturer's standard colors.
- D. Provide fascia overflow spill-out scuppers in locations shown on drawings.
- E. Sure-Seal Termination Bar: a 1 inch wide and .098 inch thick extruded aluminum bar pre-punched 6 inches on center; incorporates a sealant ledge to support Lap Sealant and provide increased stability for membrane terminations.

2.08 RELATED MATERIALS

- A. Wood Nailer:
Treated wood nailers shall be installed at the perimeter of the entire roof and around such other roof projections and penetrations as specified on Project Drawings. Thickness of nailers must match the insulation thickness to achieve a smooth transition and/or insure the top of the new roof edge fascia is level around the roof perimeter. Wood nailers shall be treated for fire and rot resistance (wolmanized or osmose treated) and be #2 quality or better lumber. Creosote or asphalt-treated wood is not acceptable. All wood shall have a maximum moisture content of 19% by weight on a dry-weight basis.

PART 3 - EXECUTION

3.01 GENERAL

- A. Comply with the manufacturer's published instructions for the installation of the membrane roofing system including proper substrate preparation, jobsite considerations and weather restrictions.
- B. Position sheets to accommodate contours of the roof deck to avoid bucking water.

3.02 EXAMINATION

- A. A survey of existing interior building conditions shall be made by both the Design/Builder and the Owner prior to the start of construction operations. All defects shall be noted and the Design/Builder shall prepare a list of same in writing. Said list shall be given to the Owner for his review and approval. If the Design/Builder does not submit a list to the Owner it will be assumed that there are no defects in the building and the Design/Builder takes full responsibility for construction related damage to the interior of the building for the duration of the project.
- B. After removal of the existing roofing system the Design/Builder shall carefully examine the roof deck in regards to conditions that may affect proper execution of the work. Any variations shall be reported to the owner's representative prior to the installation of the new roofing system.
- C. Any damages caused by the Design/Builder's operations shall be repaired to the satisfaction of the Owner at the Design/Builder's expense.
- D. Verify that roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, and wood cant strips, wood nailing strips, and reglets are in place.

- E. The Design/Builder shall investigate all existing roof drain lines. All drain lines are to be routed-out to nearest catch basin.
- F. The Design/Builder is to perform pull-out tests on the roof substrate to confirm the necessary fasteners required to be used on the project. Submit test results to the Owner.
- G. New Town Hall: The existing roofing system has not been tested by the Owner and for bidding purposes is assumed to NOT contain asbestos.

3.03 PREPARATION

- A. Remove and dispose existing roofing system, insulation down to the existing roof deck.

3.03 PROTECTION

- A. Schedule and execute all work without exposing the building interior to the effects of inclement weather. Protect the existing building, contents, and its inhabitants against all risks associated with this work.
- B. Provide suitable barriers to protect the general public.
- C. The Design/Builder shall provide additional pressure treated wood blocking at all existing roof curbs as required to meet NRCA's recommendation of 8" minimum vertical height above new roof surface unless requiring a greater height as listed on the drawings.

3.04 INSULATION PLACEMENT

- A. Install insulation over the roof deck and vapor barrier (if required) in accordance with manufacturer's instructions

3.06 MEMBRANE PLACEMENT AND BONDING

- A. Unroll and position membrane without stretching. Allow the membrane to relax for approximately 1/2 hour before bonding. Fold the sheet back onto itself so half the underside of the membrane is exposed.
- B. Apply the Bonding Adhesive in accordance with the manufacturer's published instructions, to both the underside of the membrane and the substrate. Allow the adhesive to dry until it is tacky but will not string or stick to a dry finger touch.
 - 1. Roll the coated membrane into the coated substrate while avoiding wrinkles. Brush down the bonded half of the membrane sheet with a soft bristle push broom to achieve maximum contact.
 - 2. Fold back the unbonded half of the membrane sheet and repeat the bonding procedure.
- C. Install adjoining membrane sheets in the same manner, overlapping edges approximately 4 inches. Do not apply bonding adhesive to the splice area.

3.07 MEMBRANE SPLICING (Tape Splice)

- A. Overlap adjacent sheets and mark a line 1/2 inch out from the top sheet.

- B. Fold the top sheet back and clean the dry splice area (minimum 6 inches wide) of both membrane sheets with Sure-Seal Primer as required by the membrane manufacturer.
- C. Apply Splice Tape to bottom sheet with the edge of the release film along the marked line. Press tape onto the sheet using hand pressure. Overlap tape roll ends a minimum of 1 inch.
- D. Remove the release film and press the top sheet onto the tape using hand pressure.
- E. Roll the seam toward the splice edge with a 2 inch wide steel roller.
- F. Install a 6 inch wide section of Pressure-Sensitive Flashing or Elastoform Flashing over all field splice intersections and seal edges of flashing with Lap Sealant.
- G. The use of Lap Sealant with tape splices is optional except at tape overlaps and cut edges of reinforced membrane where Lap Sealant is required.

3.08 FLASHING

- A. Wall and curb flashing shall be cured EPDM membrane. Continue the deck membrane as wall flashing where practicable.
- B. Follow manufacturer's typical flashing procedures for all wall, curb, and penetration flashing including metal edging/coping and drip edge at gutter applications.
- C. Provide fascia sump scuppers and spillout scuppers using material that matches appearance and coordinates with the metal fascia system. See drawings for locations.

3.08 WALKWAY PADS

- A. Provide walkways around all rooftop mechanical units and at any scuttles.
- B. Provide and install Carlisle Walkway Pads adhered to the membrane with splicing cement.

3.09 ROOF DRAINS

- A. All drains are to be sumped 2' out from center or are to be elongated to provide appropriate drainage when valley lines are off-set.
- B. Provide flashing per manufacturer's instructions.
- C. Provide and install roof drains as specified in Section 07 22 00.

3.09 RETROFIT DRAINS

- A. All drains are to be sumped 2' out from center or are to be elongated to provide appropriate drainage when valley lines are off-set.
- B. Remove existing drain components

- C. Insert retrofit drain body into existing drain pipe until flange is flush with roof membrane. See Specification Section 07 72 00.
- D. Alternately tighten seal compression screws until tight. Retrofit roof drain is correctly installed when pressure placed on drain body throat results in no vertical movement.
- E. Provide flashing per manufacturer's instructions.
- F. Place clamping ring over raised bossed. Install screws to tighten clamping ring against membrane flashing until secure.
- G. Install strainer dome to complete installation

3.09 DAILY SEAL

- A. When the completion of flashings and terminations is not achieved by the end of the work day, a daily seal must be performed to temporarily close the membrane to prevent water infiltration.
- B. Use Sure-Seal Pourable Sealer or other acceptable membrane seal in accordance with the manufacturer's requirements.

3.10 CLEAN UP

- A. Clean work under provisions of Section 01 70 00
- B. Perform daily clean-up to collect all wrappings, empty containers, paper, and other debris from the project site. Upon completion, all debris must be disposed of in a legally acceptable manner.
- C. Prior to the manufacturer's inspection for warranty, the applicator must perform a pre-inspection to review all work and to verify all flashing has been completed as well as the application of all caulking.

END OF SECTION

SECTION 07 61 13

STANDING SEAM METAL ROOFING

PART 1 - GENERAL

1.01 SUMMARY

- A. Related Documents:
The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.02 SUMMARY

- A. Section includes: Prefinished, prefabricated, snap-together, structural standing seam roof system and accessories.
- B. Related Sections
 - 1. Section 07 31 13 - Architectural Roof Shingles
 - 2. Section 07 53 50 - Elastomeric Membrane Roofing
 - 3. Section 07 62 11 - Sheet metal flashing
 - 4. Section 07 71 23 - Gutters and Downspouts
 - 5. Section 07 92 13 - Joint Sealants

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A 653: Steel Sheet, Zinc-Coated by the Hot Dip Process
 - 2. ASTM A 792: Steel Sheet, Aluminum-Zinc Alloy Coated by the Hot Dip Process.
 - 3. ASTM B 209: Aluminum and Aluminum Alloy Sheet and Plate.
 - 4. ASTM E 283: Air leakage
 - 5. ASTM E 331: Water penetration
 - 6. ASTM E 1646-95 Water Penetration
 - 7. ASTM E 1680-95 Air Infiltration and Exfiltration
- B. Underwriters Laboratory
 - 1. UL Building Materials Directory
 - 2. Underwriters Laboratories Construction No. 274, 274a, and 369 for Uplift Test 580 Class 90.
- C. Sheet Metal and Air Condition Contractors National Association, Inc. (SMACNA)
 - 1. SMACNA Architectural Sheet Metal Manual
- D. American Iron and Steel Institute (AISI)
 - 1. AISI Cold Formed Steel Design Manual
- E. Aluminum Association
 - 1. Aluminum Design Manual
- F. Code references
 - 1. ASCE, Minimum Loads for Buildings and Other Structures

1.04 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide factory formed, prefinished, snap-together, concealed clip, structural standing seam metal roof system, that has been pretested and certified by manufacturer to comply with specified requirements under installed conditions.
 - 1. Provide UL90 rated roofing system that has been tested in accordance with UL 580 test procedure. Steel panels shall be capable of spanning 3'-0" o.c. purlins with UL90 rating.

2. Resistance to air leakage: there was no air infiltration at 20 psf pressure differential. There was 0.06 cfm/ft.² air exfiltration at 20 psf pressure differential.
 3. Resistance to water penetration: there was no leakage through panel joints when tested in accordance with ASTM E 1646 at static pressure differential of 12.0 psf.
- B. Structural Requirements: Engineer panels for structural properties in accordance with latest edition of American Iron and Steel Institute *Cold Formed Steel Design Manual* using "effective width" concept and Aluminum Association's *Aluminum Design Manual*.

1.04 SUBMITTALS

- A. Submit product literature, shop drawings, and samples in accordance with Section 01 33 00.
- B. Product Data: submit manufacturer's specifications, standard profile sheet, product data brochure and finish warranty.
- C. Shop Drawings: shop drawings showing roof plan with layout of panels, clips, clip attachment, underlayment and sections of each flashing/trim condition shall be submitted for approval prior to fabrication. Drawings shall contain material type, metal thickness and finish. Drawings shall distinguish between factory and field fabrication.
- D. Samples:
 1. Submit sample 12" long x full width panel, showing proposed metal gauge, seam profile and specified finish.
 2. Submit manufacturers standard colors for Owner's selection.
- E. Test Reports:
 1. Submit the test reports prepared by Underwriters Laboratory indicating wind uplift rating of proposed roof system. The manufacturer must be listed by name in the UL Directory.
 2. Air leakage per ASTM E 1680 and Water penetration per ASTM E 1646 (Actual independent laboratory certified test results must be submitted).
- F. Certification: Submit manufacturer's certification that materials and finishes meet specification requirements.

1.05 QUALITY ASSURANCE

- A. Panel manufacturer shall have a minimum of ten (10) years of experience in manufacturing architectural roofing.
- B. Panel installer shall have a minimum of two (2) years experience in the installation of standing seam metal roofing and show evidence of successful completion of at least three (3) projects of similar size, scope, and complexity.

1.06 DELIVERY, STORAGE, and HANDLING

- A. Deliver under provisions of Section 01 60 00.
- B. Panels and flashings shall be protected and properly packaged to protect against transportation damage in transit to the jobsite.
- C. Upon delivery, exercise care in unloading, stacking, moving, storing, and erecting panels and flashings to prevent twisting, bending, scratching, or denting.
- D. Store panels and flashings in a safe, dry environment under a waterproof covering to prevent water damage. Allow for adequate ventilation to prevent condensation. Panels and flashings with strippable film shall not be stored in direct sunlight.
- E. Upon installation immediately remove strippable film from panels and flashings. Protect panels and flashings from foot traffic and from all other trades.

1.07 PROJECT CONDITIONS

- A. Field dimensions shall be taken prior to fabrication to verify jobsite conditions.
- B. Minimum recommended pitch for this panel is 1:12.

- C. Maximum panel length is 48' (contact the factory for longer panels).

1.08 WARRANTIES

- A. Panel manufacturer shall provide a twenty (20) year warranty on the paint finish covering chalking, cracking, checking, chipping, blistering, peeling, flaking, and fading.
- B. Applicator shall furnish written warranty for a two (2) year period from date of substantial completion of building covering repairs required to maintain roof and flashings in watertight conditions.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

- A. Subject to compliance with requirements of this Specification Section, provide products listed herein from one of the following:
 - 1. Berridge Manufacturing
 - 2. Fabral
 - 3. Pac-Clad by Peterson
- B. Basis of Design: Fabral
- C. Substitutions: Under provisions of Section 01 60 00.

2.02 PRODUCT DESCRIPTION

- A. Model: Slim Seam structural standing seam roof system as manufactured by Fabral.
- B. The Slim Seam panel shall have a coverage of 16". Seams shall be 1 1/2" high.
- C. Roof panels shall use a one-piece roof clip allowing for unlimited thermal movement of the panel system.
- D. The panel shall have a factory applied mastic and be seamed by snapping together the integral seam.
- E. The panel system shall be as a true standing seam shape requiring no trapezoidal foam closures, plugs, or fillers at eaves.

2.03 MATERIALS AND FINISHES

- A. Panel materials
 - 1. 0.032", 3105-H14 or equivalent (20 ksi yield strength) aluminum alloy conforming to ASTM B 209.
- B. Texture: panels shall be smooth.
- C. Finish: Refer to manufacturer's standard colors to determine appropriate finish and color. All panels shall receive a factory-applied Kynar® 500/Hylar® 5000 conforming to AAMA 2605 requirements and the following:
 - 1. Metal preparation: all metal shall have the surfaces carefully prepared for painting on a continuous process coil coating line by alkali cleaning, hot water rinsing, application of chemical conversion coating, cold water rinsing, sealing with an acid rinse, and thorough drying.
 - 2. Prime coating: a base coat of epoxy paint, specifically formulated to interact with the top-coat, shall be applied to the prepared surfaces by roll coating to a dry film thickness of 0.20 ± 0.05 mils. This prime coat shall be oven cured prior to application of finish coat.
 - 3. Exterior coating: a Kynar® 500/Hylar® 5000 finish coating shall be applied over the primer by roll coating to a dry film thickness of 0.80 ± 0.05 mils for a total dry film thickness of 1.00 ± 0.10. This finish coating shall be oven-cured.
 - 4. Interior coating: a washcoat shall be applied on the reverse side over the primer by roll

coating to a dry film thickness of 0.30 ± 0.05 mils for a total dry film thickness of 0.50 ± 0.10 mils. The washcoat shall be oven-cured.

5. Color: the color of the exterior finish shall be selected by the Owner from the manufacturer's standard colors.
6. Physical properties: the coating shall conform to the manufacturer's standard performance criteria as listed by certified test reports for fade, chalk, abrasion, humidity, adhesion, pollution resistance, and others as required and standard within the industry.

2.04 ACCESSORIES

- A. Concealed clips:
 1. 1 pc.: 22 ga. stainless steel UL90 rated clip, 3" long.
 2. 1 pc.: 24 ga. galvanized steel clip, 3" long.
- B. Flashing and Trim
 1. All flashing and trim shall be of the same material, gauge, finish, and color as the roof panels and fabricated in accordance with standard SMACNA procedure and details.
 2. Provide transition rib covers where roofing changes pitch.
- C. Fasteners
 1. Clips to substrate: Screw shall be #10 diameter, self tapping type (for attachment to wood) or self-drilling, self tapping (for attachment to light gauge structurals), zinc-plated steel with a flat, phillips drive head.
 2. Flashings to panels: exposed screws shall be zinc plated with a #14 x 1" combination steel and neoprene washer, color to match panel.
- D. Sealants
 1. Shall not contain oil, asbestos, or asphalt.
 2. Factory applied sealant shall be applied in the seam and designed for metal to metal concealed joints.
 3. Field applied panel end sealant shall be mastic tape sealant.
 4. Exposed sealant shall be one-part polyurethane joint sealant. Coordinate color with roof panels.
- E. Closures
 1. Ridge and hip closures shall be protected and supported by a formed metal closure manufactured from the same material, color, and finish as the panels.
 2. Metal closures shall be factory fabricated and field-cut as needed.
- F. Vapor Retarder:
 1. Retarder with a permeance of 0.05 or less as determined by ASTM E 98.

2.05 FABRICATION

- A. Roof panels shall be formed in continuous lengths. End laps will not be allowed.
- B. Panels shall to be roll formed on a stationary industrial type rolling mill to gradually shape the sheet metal. Portable rollformers, rented or owned by the installer, are not acceptable.
- C. Fabricate flashings from the same material as the roof system.

PART 3 - EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions, and product cartons for installation.

3.02 EXAMINATION

- A. Installer shall:

1. Inspect roof purlins to verify that it complies with shop drawings and is smooth, even, sound, and free of depressions.
2. Report variations and potential problems in writing to the Owner.

3.03 INSTALLATION

- A. Conform to the standard set forth in the SMACNA architectural sheet metal manuals and the approved shop drawings detailed for the project.
- B. Install panels plumb, level, and straight with the seams parallel, conforming to the design as indicated.
- C. Install panel system so it is watertight, without waves, warps, buckles or distortions, and allow for thermal movement considerations.
- D. Abrasive devices shall not be used to cut on or near roof panel system.
- E. Apply sealant tape or caulking as necessary at flashing and panel joints to prevent water penetration.
- F. Remove any strippable film immediately upon exposure to direct sunlight.
- G. Vapor retarder: The joints, perimeter, and all openings shall be sealed per the manufacturer's instructions to provide a continuous vapor retarder.

3.04 CLEANING

- A. Dispose of excess materials and debris from jobsite.
- B. Remove filings, grease, stains, marks, or excess sealants from roof panel system to prevent staining.
- C. Protect work from damage from other trades until final acceptance.

END OF SECTION

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SECTION 07 62 11

SHEET METAL FLASHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Documents:
The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.2 SECTION INCLUDES

- A. Sheet metal work.
- B. Custom sheet metal assemblies.

1.3 RELATED SECTIONS

- A. Section 07 31 13 - Architectural Roof Shingles
- B. Section 07 53 50 - Elastomeric Membrane Roofing
- C. Section 07 61 13 - Standing Seam Metal Roofing
- D. Section 07 92 13 - Joint Sealants

1.4 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight. Conform to the following requirements:
 - 1. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

1.5 SUBMITTALS

- A. Comply with Division 1 General Requirements and submit for approval:
 - 1. Product Data: Manufacturer's literature including installation instructions, use restrictions and limitations.
 - 2. Shop drawings: Provide large scale shop drawings for fabrication, installation and erection of all parts of the work. Provide large scale plans, elevations, and details of profiles, joints, seams, anchorages, connections and accessory items. Include statement that materials are physically compatible.
 - a. Field Measurements: Take accurate field measurements before fabrication and indicate same on shop drawings.
 - b. Include attachment details. Identify both shop- and field-assembled work.
 - c. Identify material, thickness, weight, and finish for each item.
 - d. Include details for:
 - 1. Forming, including profiles, shapes, seams, and dimensions.

2. Joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments.
3. Termination points and assemblies.
4. Expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
5. Counterflashings.
6. Connections to adjoining work.
3. Samples: Submit final samples of selected products. Include samples showing full variation of color and finish expected. Size: 144 square inches or more.
 - a. Sheet Metal Flashing: including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
 - b. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: In required profile. Include fasteners and other exposed accessories.
 - c. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.
- B. Source Limitations: Obtain materials of a uniform quality, including color for exposed work, from single manufacturer for each component.
 1. Standards: Comply with applicable requirements, recommendations and details of SMACNA Architectural Sheet Metal Manual.

1.7 PRODUCT REQUIREMENTS

- A. Comply with product requirements, delivery storage and handling provisions of Division1 and the following:
 1. Ensure materials are not adversely affected by galvanic action, or excess differential thermal movement.
 2. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.
 3. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
 4. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.6 PROJECT CONDITIONS

- A. Protection: During construction, cover work with waterproof sheeting at end of each day's work. Prevent the intrusion liquid water and the build up of water vapor pressure within assemblies.
- B. Stain Prevention: Prevent grout, mortar, and soil from staining of work be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such.

PART 2 - PRODUCTS

2.1 FLASHING & SHEET METAL

- A. Stainless-Steel Sheet: ASTM A 240/A or ASTM A 666, Type 304/Type 316, dead soft, fully annealed; with smooth, flat surface. Provide thicknesses shown, if not as follows:
 - 1. Not otherwise indicated: 0.019 inch.
 - 2. Counterflashing and the like: 0.032 inch.
 - 3. Apron, step flashing, backers: 0.016 inch.
- B. Sheet Aluminum: ASTM B 209, alloy 3003-H14, 0.050 inch thickness minimum. Use for brake metal.

2.2 MISCELLANEOUS MATERIALS

- A. Components include:
 - 1. Fasteners: Match material being fastened for both type of material and finish.
 - 2. Isolation Coating: SSPC paint 12.
 - 3. Slip Sheet: 5 lb. rosin building paper.
 - 4. Plastic Underlayment: 6 mil carbonated polyethylene film, FS L-P-512.
 - 5. Reglets: Metal units of type and profile indicated or required which are compatible with flashings used.
 - 6. Solder: ASTM B 32, as required.
 - 7. Accessories: Provide all clips, cleats, straps, anchors and similar items necessary to properly complete the work. Provide accessories that are compatible with sheet metal materials used and which are of sufficient size and gage to perform as intended.
 - 8. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane or silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
 - 9. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
 - 10. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.
 - 11. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.3 FABRICATION

- A. Shop fabricate work to the greatest extent possible. Fabricate work to be truly straight, plumb, level and square, and to provide the best possible watertight, weatherproof performance with expansion provisions in running work.
- B. Provide work to sizes, shapes, and profiles indicated on approved shop drawings. Comply with referenced standards. Minimize oil-canning, buckling, tool marks and other defects.
- C. Make work with uniform, watertight joints. Make seams as inconspicuous as possible.
- D. Isolate dissimilar materials with isolation coating or other permanent separation acceptable to the Owner.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine and verify conditions as follows:
 - 1. Verify substrates and underlying work is within tolerances specified.
 - 2. Verify structural components are properly placed.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 TOLERANCES

- A. For exposed work, the following allowable installed tolerances are allowable variations from locations and dimensions indicated by the Contract Document and shall not be added to allowable tolerances indicated for other work.
 - 1. Allowable Variation from True Plumb, Level, and Line: +/- 1/8" in 20'-0"
 - 2. Allowable Variation from True Plane of Adjacent Surfaces: +/- 1/16"

3.3 INSTALLATION

- A. Install flashing in continuous uninterrupted manner to accomplish 'intent' complete with all transitions, laps, splices, folds, seams necessary to ensure the diversion of water to the exterior. Work in close coordination with installation of exterior masonry, roofing, window, joint sealer, louver, and the like.
 - 1. Apply materials within manufacturer's requirements for temperature and weather conditions.
 - 2. Do not apply to wet or frozen substrates.
 - 3. Do not allow contamination with dust or dirt.
 - 4. Seal completely at edges, perimeter and penetrations.
- B. Strictly comply with manufacturer's instructions and recommendations and standard details and recommendations of SMACNA, except where more restrictive requirements are specified in this section. Locked and sealant locked joints as indicated on the Drawings.
- C. Securely anchor work, but allow for thermal movement and building movement. Use concealed fasteners to the greatest extent possible. Install work to be permanently weatherproof and watertight. Provide continuous cleats at all edge conditions.
- D. Provide reglets where indicated and where required. Coordinate installation with related and adjacent work.
- E. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
 - 2. Use lapped expansion joints only where indicated on Drawings.
- F. Fasteners: Use fastener sizes that penetrate wood or sheathing substrate not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws and for other substrates

not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

- H. Provide flashing at every obstruction to the downward flow of water. Design and install flashing to control and divert water to the exterior. Form at least 4" high end pans above lintels and similar conditions to extend the entire length of the lintel where possible. Flashing shall extend 4" minimum beyond end of lintel before it is panned (dammed).

3.4 CLEAN UP & PROTECTION

- A. Adjust work to conform to specified tolerances and appear uniform, straight and correct. Touch-up damaged coatings and finishes to eliminate evidence of repair.
 - 1. Repair minor damage to eliminate all evidence of repair. Remove and replace work which cannot be satisfactorily repaired.
 - 2. Clean exposed surfaces using materials and methods recommended by manufacturer of material or product being cleaned. Remove and replace work that cannot be successfully cleaned.

END OF SECTION

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SECTION 07 71 23

GUTTERS AND DOWNSPOUTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Aluminum premanufactured gutters and downspouts

1.02 REFERENCES

- A. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

1.03 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.

PART 2 - PRODUCTS

2.02 MATERIALS

- A. Gutters: Manufactured in uniform section lengths with matching corner units, ends, outlet tubes, and other accessories as required. Elevate back edge at least 1 inch above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters.
 - 1. Fabricate from the following exposed metal:
 - a. Formed Aluminum: 0.040 inch
 - 2. Gutter Profile: Style K according to SMACNA's "Architectural Sheet Metal Manual."
 - 3. Corners: Factory mitered and mechanically clinched and sealed watertight.
 - 4. Gutter Supports: Internal concealed hanger.
 - 5. Gutter Accessories: Continuous snap-in leaf guard
- B. Downspouts: Plain rectangular complete with machine-crimped elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.
 - 1. Formed Aluminum: 4"x5" and 0.032 inch thick

2.03 ACCESSORIES

- A. All accessories designed for use with the gutters and have the same finish. Mill finish accessory components include hangers and expansion joints.
Roof aprons: .027" gauge
End caps: .024" gauge

Expansion joints: Aluminum lined with neoprene
Downspout clip: .014: gauge

- B. Nails: Aluminum nails of 5056 or 6110 alloy having a minimum tensile strength of 63,000 psi. All nails shall have a suitable etch finish to remove greases and provide additional holding power.

2.04 FINISHES

- A. Exterior coating to be Kynar 500 or equal. Color as selected by Owner from manufacturer's standard colors.
- B. Interior coating to be a corrosion inhibiting finish.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Verify governing, dimensions at building; examine, clean and repair, if necessary, any adjoining work on which this work is in any way dependent for its proper installation.
- B. Provide and install quantity of downspouts required to accommodate the rainfall at the rate of 1,200 sq. ft. of roof area on the horizontal maximum per downspout.

3.02 INSTALLATION

- A. Install gutter using hangers so that movement is not restricted.
- B. Gutter hangers shall be installed a maximum of 32" on center and nailed to the roof sheathing or fascia board at rafter locations. Nails shall be 1-1/2" aluminum screw shank nails.
- C. Gutters shall not have seams in lengths 37 feet and under.
- C. Provide expansion joints on all sides of a hip roof and on runs of more than forty feet in length.
- D. Pitch gutters down toward downspouts at 1/16" per foot minimum.
- E. Dissimilar materials shall receive a protective coating as required.
- F. Gutters shall support a minimum of 50 pounds per linear foot installation.
- G. All downspouts shall empty onto the finish grade or into a storm drainage system.
- H. Downspouts shall be attached to the face of the building in accordance with manufacturers instructions and recommendations.

3.03 CLEANING

- A. Clean work under provisions of Section 01 70 00.
- B. Clean all aluminum surfaces
- C. All scrap materials shall disposed off-site.

3.04 PROTECTION OF FINISHED WORK

- A. Protect finished work under provisions of Section 01 70 00.

END OF SECTION

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SECTION 07 84 13

FIRESTOPPING

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

- A. The work of this Section consists of the provision of all plant, materials, labor and equipment and the like necessary or required for the complete execution of all firestopping and smoke seal work for this project as required by the schedules, keynotes and drawings, including, but not limited to the following:

NOTE – Firestopping is defined as a material, or combination of materials, to restore the integrity of fire rated walls and floors by maintaining an effective barrier against the spread of flame, smoke and toxic gases.

1. Provide firestopping and smoke seals as indicated on the drawings and as required to maintain full and continuous smoke and fire barrier between zones.

Seal all penetrations between floor/ceiling plane with expanding foam. No fiber insulation packing is permitted.

Cope and seal around all structural elements to insure smoke and fire barriers.
2. Provide firestopping of all openings in floors and walls both empty and those accommodating penetrating items such as cables and wires, cable trays, conduits, pipes, ducts, etc.; coordinate with Divisions 23 and 26.
3. Provide firestopping at joints between curtain walls and floor or roof openings and balance of openings between exterior walls and connecting floor assemblies at each floor.
4. Pack expansion joints in fire rated walls and floors;
5. Provide firestopping of openings at each floor level in shafts or stairwells.

1.02 PREINSTALLATION CONFERENCE

- A. A preinstallation conference shall be scheduled in accordance with Section 01 31 00 by the Design/Builder with this specialty contractor and all other specialty contractors, subcontractor and the like to establish procedures to maintain optimum working conditions and to coordinate the work of this section with related and adjacent work.

1.03 QUALITY ASSURANCE

- A. Firestopping materials shall conform to both Flame (F) and Temperature (T) ratings as tested by nationally accepted test agencies per ASTM E 814 or UL 1479 fire tests.

The F rating and T rating must be a minimum of 1 hour but not less than the fire resistance rating of the assembly being penetrated.

The fire test shall be conducted with a minimum positive pressure differential of 0.03 inches of water column.

- B. Firestopping shall be performed by a Specialty Contractor trained or approved, in writing, by firestop material manufacturer.

Said specialist shall be as defined in the conditions.

Equipment used shall be in accordance with firestop material manufacturer's written installation instructions.

- C. Materials shall conform to all applicable governing codes.
- D. All materials used in the work shall be certified "asbestos free" and shall be free from any and all solvents or components that require hazardous waste disposal or, that after curing, dissolve in water.
- E. All materials shall comply with the interior finish flame spread and smoke developed requirements for the area in which they are installed. Coordinate with governing codes.

1.04 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Certification of specification compliance of all materials.
- C. Manufacturer's printed product data and drawings indicating product characteristics, performance, detail applications and limiting criteria.

Submittal shall include applicable UL and/or FM assembly numbers for each material and proposed installation.

- D. Manufacturer's installation instructions for each type of firestop required by the project.
- E. Manufacturer's approval of nominated installer of firestopping and smoke seal products.
- F. Mockups:
 - 1. Prepare job mockup of the material proposed for use in the project as directed by Owner. Approved markups shall be left in place as part of the finished project and will constitute and standard for remaining work, including aesthetics.
- G. Manufacturers Material Safety Data Sheet (MSDS) must be submitted for each manufactured product.

1.05 PRODUCT DELIVERY STORAGE AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.

- B. Deliver all materials to be used in the work of this section to the project site in original sealed containers with manufacturer's brand and name, lot numbers, UL labeling, mixing and installation instructions clearly identified thereon.

- C. Store all materials in accordance with manufacturer's directions.

All materials shall be dated with shelf life and shall be removed from the project site at the contractor's expense if date is expired.

1.06 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. E 814 – Standard Method of Fire Tests of Through Penetration Fire Stops.
 - 2. E 119 – Methods of Fire Tests of Building construction and Materials.
 - 3. E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. Underwriters Laboratories, Inc. (UL)
 - 1. UL 1479 – Fire Tests of Through Penetration Fire Stops.
 - 2. UL 263 – Fire Tests of Building Construction and Materials.
 - 3. UL 723 – Surface Burning Characteristics of Building Materials.
 - 4. UL "Fire Resistance Directory" current year.
- C. Factory Mutual (FM) Approval Guide, current year.
- D. Building code of the jurisdiction of the work.
- E. National Fire Protection Association
 - 1. NFPA 101 – Life Safety Code.
 - 2. NFPA 70 – National Electrical Code.

1.07 PROJECT CONDITIONS

- A. Conform to manufacturer's printed instructions for installation and when applicable, curing in accordance with temperature and humidity. Conform to ventilation and safety requirements.
- B. Coordinate work required with work of other trades; firestopping shall, where practical, precede gypsum board or other applied sheet finishing operations.
- C. Where firestopping is installed at locations which will remain exposed in the finished work, provide protection as necessary to prevent damage to adjacent surfaces and finishes, and protect as required against damage from other construction operations.

PART 2 – PRODUCTS

2.01 **SPECIFICATION STANDARD:** For purposes of establishing standards of quality and levels of performance and not for the purposes of limiting competition, the basis of this specification is upon units as manufactured by one of the following and their respective model suitable for the intended application.

A. Bio Fireshield, Inc.; Damonmill Square, Concord, MA 01742.

1. Novasit K-10 Firestop Mortar
2. K-2 Firestop Mortar
3. Biotherm Firestop Sealants and Caulk
4. Firestop Sleeve
5. Firestop Pillows
6. Biostop 500 Intumescent Caulk

B. IPC Corp.

1. KBS Mortar Seal
2. Flamesafe Sealants and Caulk
3. FPS 1000 Putty and 1077 Putty Pads
4. Firestop Kits – FSK200
5. KBS Seal Bags
6. Quelpyre Tapes and Blankets

C. Dow Corning

1. Firestop Sealant #2000
2. Firestop Foam #2001

D. 3M Corporation

1. Fire Barrier Caulk, CP-25WB
2. Fire Barrier MPS-2 Putty and 4S Putty Pads
3. Fire Barrier Intumescent Wrap Strip #FS-195

E. Nelson Firestop Products

1. FSP Firestop Putty
2. CMP Firestop Compound
3. CLK Firestop Sealant
4. PLW intumescent Pillow
5. PCS Preformed Collar for Plastic Pipe Penetrations
6. MPS Multi-Plug
7. MCT Multi-Cable Transit
8. EMCT Multi-Cable Transit and Plug
9. CTG Firestop Coating
10. CPS Composite Sheet

F. Tremco, Inc.

1. Fyre-Sil and Fyre-Sil SL
2. Fyre-Shield
3. THC-900/901
4. Dymeric, Dymonic Sealant Systems
5. Compatible forming systems.

- G. General Electric
 - 1. Pensil 100 Sealant
 - 2. Pensil 200 Foam
 - 3. Pensil 300 Joint Sealant
 - 4. Pensil 500 Putty
 - 5. Compatible forming systems.
- H. U.S. Gypsum Company
 - 1. U.S.G. "Thermafiber" unfaced safing insulation with third party wrap, 3.5 pcf density, UL R-10905 label.
 - 2. U.S.G. "Firecode" compound.
- I. Hilti Corporation
 - 1. Hilti CP 645 insulated firestop sleeve to replace existing pipe insulation

2.02 ACCESSORY ELEMENTS

- A. Forming, damming materials shall be mineral fiber board or other suitable material recommended by nominated system manufacturer.
- B. Primers, sealant and solvent cleaners shall be as recommended by the nominated system manufacturer.
- C. Metal Systems – 20 gauge phosphatized, electrogalvanized steel plate or galvanized steel clips.

PART 3 – EXECUTION

3.01 INSPECTION AND ACCEPTANCE

- A. Examine all surfaces and contiguous elements to receive work of this section and correct, as part of the work of this contract, any defects affecting installation.
- B. Commencement of work will be construed as complete acceptability of surfaces and contiguous elements.

3.02 PREPARATION

- A. The surface shall be dry, clean, and free of all foreign matter.
- B. Do not apply firestopping to surfaces previously painted or treated with a sealer, curing compound, water repellant or other coatings unless tests have been performed to ensure compatibility of materials.
- C. Provide primers as required which conform to manufacturer's recommendations for various substrates and conditions.
- D. Mask where necessary to protect adjoining surfaces.
- E. Remove excess material and stains on surfaces as required.

3.03 INSTALLATION – GENERAL SYSTEMS

- A. Install in strict accordance with manufacturer's printed instructions.
- B. Ensure that anchoring devices, backup materials, clips, sleeves, supports and other materials used in the actual fire test are installed.
- C. Install firestopping with sufficient pressure to properly fill and seal openings to ensure an effective smoke seal.
- D. Tool or trowel exposed surfaces. Remove excess firestop material promptly as work progresses and upon completion.
- E. Install dams when required to properly contain firestopping materials within openings and as required to achieve required fire resistance ratings. Combustible damming materials must be removed after appropriate curing. Incombustible damming materials may be left as a permanent component of the firestopping systems.

3.04 FIRESTOPPING CONSTRUCTION AT BUILDING EXTERIOR PERIMETERS, INTERIOR WALLS, SHAFTS, ETC.

- A. Install material of proper size on continuous plates or clips as required for proper support in order to safe-off area between exterior walls, interior walls and shafts and floor slabs, said walls and roof areas leaving NO VOIDS.
- B. Firestopping is required at all juncture conditions whether or not clips, angles or other structural elements exist either intermittently or continuously.
- C. Attach plates and clips to floor levels and other breaks and extend through framing to sheathing or other solid strata.
- D. Where metal decking flutes, either parallel or perpendicular to walls, occur and are open, same shall be fully packed and sealed with proper firestopping system.
- E. Where firestopping is accomplished after installation of drywall or other applied sheet finish, all spaces between penetrations and finish shall be filled to the thickness of said sheet finish with intumescent caulk.
- F. At all linear openings, fill voids with a minimum of 6 inches of minimum 3.5 lb./cu. ft. density safing insulation as specified in Part 2 herein and cover entire surface with UL listed firestop sealant of one of nominated manufacturers identified in Part 2 herein.

3.05 PENETRATION SEALS

- A. Penetrations are defined as conduits, cables, wires, piping, ducts or other elements passing through one through one or both outer surfaces of fire rated walls, floors or partitions and shall be firestopped on both sides of penetration in accordance with requirements set forth in Paragraph 1.04 of this Section.

- B. Where sleeves are used, same shall be as specified in Part 2 herein; in event that sleeves are not used, core openings and caulk penetrating items with intumescent system the full length of penetration and seal on both sides with intumescent caulk.
- C. Residual openings within square or rectangular holes shall be filled with compounds applicable for substrate encountered and all penetrations sealed on both sides with caulk.
- D. Where existing pipes penetrate new partition, replace existing pipe insulation with new insulated firestop sleeve and seal perimeter of remaining opening on both sides with caulk.

3.06 **FIELD QUALITY CONTROL**

- A. Design/Builder shall immediately notify the Owner if the firestopping systems herein specified cannot meet the requirements of the specification.
- B. Design/Builder shall examine firestops to ensure proper installation and full compliance with this specification.
- C. All areas of work must be accessible until inspection by the applicable code authorities.
- D. Correct unacceptable firestops and provide additional inspection to verify compliance with this specification at no additional cost.

3.07 **CLEANING**

- A. When finished work will be visible, clean adjacent surfaces in accordance with manufacturer's printed instructions.
- B. If visible in the finished work, remove temporary dams after initial cure of firestops.
- C. Correct staining and discoloring on adjacent surfaces.
- D. Remove all debris and excess materials entirely from site and leave work in a neat and clean condition.

END OF SECTION

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SECTION 07 92 13

JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Documents:
The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.2 SECTION INCLUDES

1. Elastomeric joint sealants.
2. Joint backer materials
3. Accessories
4. Primers, joint preparation, tooling.

1.3 RELATED SECTIONS

1. Division 09 Section "Gypsum Board" for sealing perimeter joints.
2. Division 09 Section "Tile" for sealing tile joints.
3. Section 08 12 13 - Steel Door Frames
4. Section 08 43 13-Aluminum Storefront System
5. Section 08 53 13-Vinyl Double Hung Window
6. Section 09 21 16 - Steel Framed Drywall System
7. Section 09 81 16 - Sound Attenuation Insulation

1.4 PRECONSTRUCTION TESTING

- A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 2. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: For each joint-sealant product indicated.

- C. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- D. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.
- E. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
- G. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.
- C. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.

1.7 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

- A. Provide under the provisions of Section 01 78 00.
- B. Material Warranty Period: Two years from date of Substantial Completion.
- C. Applicator's Warranty Period: Two years from date of Substantial Completion covering workmanship.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers as listed below
- B. Substitutions: Under provisions of Section 01 60 00.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. VOC Content of Interior Sealants: Provide sealants and sealant primers for use inside the weatherproofing system that comply with the following limits for VOC content when calculated according to 40 CFR 59, Part 59, Subpart D (EPA Method 24):
 - 1. Architectural Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
- C. Colors of Exposed Joint Sealants:
As selected by Owner from manufacturer's full standard range.
- D. Without limitation, joints to be sealed include:
 - 1. Perimeter of door frames, and windows.
 - 2. Exterior and interior concrete and masonry construction.
 - 3. Penetrating or abutting elements, such as louvers, aluminum storefront, metal frames and the like.
 - 4. Interior gaps and to provide a smooth surface for painting.
 - 5. Restroom & other counters and adjacent walls.

2.3 SEALANTS

- A. Acrylic Latex Sealant:
Provide latex rubber modified-acrylic emulsion permanently flexible sealant complying to ASTM C 834 meeting or exceeding these specified requirements.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Pecora AC-20
 - b. Tremco Acrylic Latex 834
 - c. Sonneborn Sonolac.
 - 2. Usage: At mirrors, access doors before painting and for all interior joints except where silicone or polyurethane sealant is indicated.

- B. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant:
ASTM C 920, Type S, Grade NS, Class 25, for Use NT and Federal Spec. TT-S-001543A Class A.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning Corporation; 786 Mildew Resistant.
 - b. GE Advanced Materials - Silicones; Sanitary SCS1702.
 - c. Tremco Incorporated; Tremsil 200 Sanitary.
 2. Usage: At interior joints around plumbing fixtures, and solid surfacing joints, bath and kitchen area joints and tile to tile joints in ceramic tile not grouted with mortar based materials.
- C. Single-Component, Neutral-Curing Silicone Joint Sealant:
ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning Corporation; 795 Silicone Building Sealant.
 - b. GE Advanced Materials: SilPruf NB SCS9000.
 - c. Tremco Incorporated; Spectrem 2
- D. Nonsag Polyurethane Multi-Part Joint Sealant:
Sealant shall be a two-component catalyst cured, gun-grade epoxidized polyurethane, non-sagging liquid sealant with hardness average of 25, conforming to ASTM C 920, Type M, Grade NS, Class 25, for Use NT.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Tremco Dymeric 240FC [fast cure]
 - b. Sika Sikaflex 2c NS
 - c. Sonneborn Sonolastic NP 2
 2. Where joint requires 50% movement capabilities, provide Tremco Dymeric Plus or approved equal.
 3. Usage: Exterior joints and interior expansion and control joints and other joints not indicated to be sealed with another type of sealant.
- E. Acoustical Joint Sealant:
Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Pecora Corporation; AC-20 FTR.
 - b. USG Corporation; SHEETROCK Acoustical Sealant.
 2. Interior acoustical joints in vertical surfaces and horizontal nontraffic surfaces.
- F. Self-leveling Polyurethane Multi-part Sealant:
Sealant shall be self-leveling type, two-component polyurethane sealant, pourable grade, with Shore A hardness of 40-50, conform to ASTM C-920, Type M, Grade P, Class 25, meeting or exceeding these specified requirements.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Sonneborn Sonolastic SL2
 - b. Tremco THC-900
 - c. Vulkem 445SSL
 2. Where joints contain bituminous materials, provide sealants modified to provide necessary compatibility.

3. Usage: Horizontal traffic joints.

G. Metal Seam Sealant

Provide product designed to seal very thin metal to metal joints and to match metal color and/or finish.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Protective Treatments Inc. PTI 200
 - b. Tremco Tremlite Seam Sealer
 - c. 3M Scotch-Seal Metal Sealant
2. Usage: At metal to metal joints in sheet and solid stock metal assemblies, aluminum tube doors or frames, window systems, and the like.

2.4 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings Rods: ASTM C 1330, Type C, Closed Cell, provide backing rods of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.
- G. Acoustical Sealant Installation: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations.

3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.
- B. Clean under provisions of Section 01 70 00.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION

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SECTION 08 12 13

STEEL DOOR FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Documents:
The Drawings and general provisions of the Contract, and Division 1 Requirements, apply to the work in this Section.

1.01 SECTION INCLUDES

- A. Steel door frames.
- B. Steel vision panel frames.

1.02 RELATED WORK

- A. Section 08 13 13 - Steel Doors
- B. Section 08 14 16 - Wood Doors
- C. Section 08 71 00 – Door Hardware
- D. Section 08 81 00 - Glass and Glazing
- E. Section 09 91 00 - Painting: Field painting of frames.

1.03 REFERENCES

- A. DHI - Door Hardware Institute: The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.
- B. ANSI/SDI-100 - Standard Steel Doors and Frames
- C. SDI-105 - Recommended Erection Instructions for Steel Frames.
- D. ASTM - E152 - Methods of fire tests of door assemblies.
- E. NFPA 252 - Fire tests of door assemblies.
- F. UL 10B - Fire Tests of door assemblies.

1.04 QUALITY ASSURANCE

- A. Conform to requirements of the DHI, SDI-100, SDI-105, NFPA 252 ASTM E152 and UL10B.

1.05 REGULATORY REQUIREMENTS

- A. Conform to State Building Code and State Fire Code.

1.06 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01 33 00.
- B. Indicate frame configuration, anchor types and spacings, location of cutouts for hardware, reinforcement, and finish.
- C. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

1.07 DELIVERY, STORAGE AND PROTECTION

- A. Protect products under provisions of Section 01 60 00.
- B. Protect frames with resilient packaging sealed with heat shrunk plastic.
- C. Break seal on-site to permit ventilation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements of this Specification Section, provide products listed herein from one of the following:
 - 1. Ceco Door
 - 2. De La Fontaine
 - 3. Steelcraft
- B. Basis of Design: Steelcraft
- C. Substitutions: Under provisions of Section 01 60 00.

2.02 METAL FRAMES

- A. TYPES
 - 1. Exterior frames: Steelcraft Model F14-4 (14 gage galvanized steel with 2" face for 1-3/4" doors)
 - 2. Interior frames: Steelcraft Model F16-4 (16 gage cold rolled steel with 2" face for 1-3/4" doors.)
- B. FABRICATION
 - 1. All frames shall be furnished as a welded unit with mitered corners. Miter and entire connection is to be continuous fully welded. Welds are ground and finished smooth.
 - 2. Fabricate frames with hardware reinforcement plates welded in place as required to coordinate with hardware schedule. Provide mortar guard boxes, 22 gage.

3. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.
4. Prepare frame for silencers. Provide three single rubber silencers for single doors on strike side, and two single silencers on frame head at double doors without mullions.
5. Fabricate frames for masonry wall coursing with a 4 inch head member (unless indicated otherwise).
6. Frames shall be furnished with a minimum of six wall anchors and two base anchors of manufacturer's standard design. Jamb anchors shall be as required to coordinate with the adjacent wall construction.
7. All fire rated frames shall carry a UL label.
8. Provide a temporary spreader bar securely fastened to the bottom of each frame.
9. The inside profile of all frames to be filled with mortar shall be coated with bituminous coating to a thickness of 1/16 inch. Coating may be field applied.
10. Steel door frame material is to contain a minimum of 30 % Pre-Consumer recycled content and 50% Post-Consumer recycled content.
11. Anchors
 - a. Quantity: Minimum 3 anchors per jamb.
 - b. Jambs over 8'-0" in height: 1 additional anchor for each 2'-0" or fraction thereof.
 - c. Construction: 18-gage steel strap or 3/16" diameter wire, adjustable or "T" shaped.
 - d. Floor anchors: Welded inside each jamb. Up to 2 inch adjustable permitted subject to compliance with standards.

2.03 GLAZED VISION PANELS

- A. Provide glazed vision panels in metal frames as shown on the drawings.
- B. Glazing shall be of the type specified in Section 08 81 00 or 08 88 13.
- C. Provide fixed stop on one side of glazing and a removable stop of 20 gauge steel on the other. Attach stop to frame with machine screws uniformly spaced at 12" maximum o.c.

2.04 FINISH

- A. After fabrication, all tool marks and surface imperfections shall be dressed, filled and sanded as required to make all faces and vertical edges smooth, level and free of all irregularities.
- B. Frames shall be thoroughly cleaned and phosphatized.
- C. All surfaces exposed to view shall receive a factory applied single coat of rust inhibiting prime paint baked-on in accordance with ANSI A224,1.
- D. The finish coats of paint shall be field applied by others in accordance with the painting section of these specifications.
- E. Where wall anchors utilizing exposed screw heads are used to install door frames, the exposed screws are to be covered with epoxy resin filler (Bondo or equal) and sanded smooth to match flush with the surrounding face.

PART 3 - EXECUTION

3.01 INSTALLATION OF FRAMES

- A. Install frames in accordance with SDI-105
- B. Install the frames plumb, rigid, and in true alignment and fasten them so as to retain their position.

3.02 CLEANING

- A. Clean in accordance with Section 01 70 00.

END OF SECTION

SECTION 08 13 13

STEEL DOORS

PART 1 - GENERAL

1.01 SUMMARY

- A. Related Documents:
The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.02 SECTION INCLUDES

- A. Steel doors.

1.03 RELATED WORK

- A. Section 08 12 13 - Steel Door Frames
- B. Section 08 71 00 – Door Hardware
- C. Section 08 71 50 – Weatherstripping
- D. Section 08 81 00 – Glass and Glazing
- E. Section 08 88 13 - Fire Rated Glass
- F. Section 09 91 00 - Painting: Field painting of doors and frames.

1.04 REFERENCES

- A. ASTM E152 - Methods of Fire Tests of Door Assemblies
- B. DHI - Door Hardware Institute: The Installation of commercial steel doors and steel frames, insulated steel doors in wood frames and builder's hardware.
- C. NFPA - 80 - Fire Doors and Windows
- D. NFPA - 252 - Fire Tests for Door Assemblies
- E. ANSI/SDI-100 - Standard Steel Doors and Frames
- F. UL 10B - fire Tests of Door Assemblies

1.05 QUALITY ASSURANCE

- A. Conform to requirements of SDI-100.
- B. Fire rated door and frame construction to conform to ASTM E152, NFPA 80, NFPA 252, and UL 10B.

1.06 REGULATORY REQUIREMENTS

- A. Conform to State Building Code and State Fire Code for fire rated frames and doors.

1.07 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01 31 00.
- B. Indicate door elevations, internal reinforcement, closure method, and cut outs for glazing.
- C. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

1.08 DELIVERY, STORAGE AND PROTECTION

- A. Protect products under provisions of Section 01 60 00.
- B. Protect doors with resilient packaging sealed with heat shrunk plastic.
- C. Break seal on-site to permit ventilation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements of this Specification Section, provide products listed herein from one of the following:
 - 1. Ceco Door
 - 2. De La Fontaine
 - 3. Steelcraft
- B. Basis of Design: Steelcraft
- C. Substitutions: Under provisions of Section 01 60 00.

2.02 HOLLOW METAL DOORS

- A. TYPES
 - 1. Interior doors: Rated and non-rated SDI Grade II, heavy duty, Model 2 (seamless and 18 gage) (Steelcraft LW door series)
Rated doors shall be as follows:
 - 2 hour rating
 - 1-1/2 hr. rating
 - 3/4 hr. rating
 - 2. Exterior doors: SDI Grade III, extra heavy duty, Model 2 (seamless and 16 gage) (Steelcraft LW door series)

B. MATERIALS

1. Interior fire rated doors:
 - a. Faces: 18 gage, cold rolled steel conforming to ASTM A-366-68
 - b. Perimeter channels to be 16 gage and welded to panels
 - c. Core to be honeycomb.
 - d. All fire rated doors shall carry a UL label.
2. Interior non-rated doors:
 - a. Faces: 18 gage, cold rolled steel conforming to ASTM A-366-68
 - b. Perimeter channels to be 16 gage and welded to panels
 - c. Core to be honeycomb.
3. Exterior doors:
 - a. Faces: 16 gage, A60 galvanized steel in accordance with ASTM A525. (A60 coating is .6 oz. of zinc per square foot of steel total coverage)
 - b. Channels to be 16 gage and perimeter welded to panels.
 - c. Core shall be foamed-in-place polyurethane insulation, "R" factor 11.1, compression strength 3600 PSI.
 - d. Top cap required.

C. FABRICATION

1. All doors shall be custom made, of the types and sizes shown on approved shop drawings, and shall be fully welded seamless construction with no visible seams or joints on their faces or vertical edges. Inverted end channel on bottom welded to both face sheets. Door thickness shall be 1-3/4" unless noted otherwise.
2. All doors shall be strong, rigid and neat in appearance, free from warpage or buckle. Corner bends shall be true and straight and of minimum radius for the gage of metal used.
3. Door faces shall be joined at their vertical edges by a continuous weld extending the full height of the door seam. All such welds shall be ground and smoothed to make them invisible and provide a smooth flush surface.
4. The vertical edge profiles on single acting swing doors shall be beveled 1/8" in 2".
5. All hardware furnished by the hardware contractor for single-acting doors shall be designed for beveled edges as specified above.
6. Hardware reinforcements:
 - a. Doors shall be mortised, reinforced, drilled and tapped at the factory for fully templated hardware in accordance with the approved hardware schedule and templates provided by the hardware contractor. Where surface-mounted hardware (or hardware, the interrelation of which is to be adjusted upon installation-such as top and bottom pivots, floor closers, etc.) is to be applied, doors shall have reinforcing plates only: all drilling and tapping shall be done by the installer.

- b. Minimum gages for hardware reinforcing plates shall be as follows:
 - 1. Hinge and pivot reinforcements 8 gage.
 - 2. Concealed or surface mounted closers - 14 gage.
 - 3. Lock face, flush bolts and all other surface mounted hardware - 16 gage.
- 7. Steel door material is to contain a minimum of 30 % Pre-Consumer recycled content and 50% Post-Consumer recycled content.

D. ACCESSORIES

- 1. Glass moldings and stops:
 - a. Where specified or scheduled, doors shall be provided with hollow metal mouldings to secure glazing by others in accordance with glass opening sizes and glass type shown on approved shop drawings.
 - b. Fixed moldings shall be securely welded to the door on the security side.
 - c. Loose stops shall be not less than 20 gage steel, with mitered corner joints, secured to the framed opening by cadium or zinc-coated countersunk screws. Snap-on attachments will not be permitted.

2.04 FINISH

- A. After fabrication, all tool marks and surface imperfections shall be dressed, filled and sanded as required to make all faces and vertical edges smooth, level and free of all irregularities.
- B. Doors shall be thoroughly cleaned and phosphatized.
- C. All surfaces exposed to view shall receive a factory applied single coat of rust inhibiting prime paint baked-on in accordance with ANSI A224,1.
- D. The finish coats of paint shall be field applied by others in accordance with the painting section of these specifications.

PART 3 - EXECUTION

3.01 INSTALLATION OF DOORS

- A. Install doors in accordance with DHI.
- B. Install doors plumb and in true alignment in a prepared opening and fasten them to achieve the maximum operational effectiveness and appearance.

3.02 TOLERANCES

- A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.
- B. All doors that are smoke doors or fire rated are to be sized as required to meet the code requirement clearances around the perimeter between the door, meeting edges of door pairs, finish floor and the frame.

3.03 ADJUSTING AND CLEANING

- A. Adjust hardware for smooth and balanced door movement.
- B. Clean in accordance with Section 01 70 00.

END OF SECTION

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SECTION 08 14 16

WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Documents:
The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.2 SECTION INCLUDES

- A. Wood doors; flush configuration; fire-rated and non-rated.

1.3 RELATED SECTIONS

- A. Section 08 12 13 - Steel Door Frames
- B. Section 08 71 00 – Door Hardware
- C. Section 08 81 00 – Glass and Glazing
- D. Section 08 88 13 - Fire Rated Glass
- E. Section 09 91 00 - Painting: Metal components (i.e. light frames, astragals, etc.)

1.4 REFERENCES

- A. ASTM E90 - Measurement of Airborne Sound Transmission Loss of Building Partitions.
- B. ASTM E152 - Methods of Fire Tests of Door Assemblies.
- C. ASTM E413 - Classification for Determination of Sound Transmission Class.
- D. AWI - Architectural Woodwork Institute Quality Standards.
- E. NFPA 80 - National Fire Protection Association Pamphlet 80 Fire Doors and Windows.
- F. NFPA 252 - National Fire Protection Association Standard Method of Fire Tests for Door Assemblies.
- G. L 10B - Underwriters Laboratories Fire Tests of Door Assemblies.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop Drawings: Illustrate door location (Room # to Room #), door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, identify cutouts for glazing.

- C. Product Data: Indicate door core materials and construction; veneer species, type and characteristics; factory machining criteria, factory finishing criteria.
- D. Samples: Submit two 12"X12" corner samples of door construction. (As required by Owner)
- E. Manufacturer's Instructions: Submit instructions regarding care of door during shipping, unloading, storage, preparation for hanging and hanging.

1.6 REGULATORY REQUIREMENTS

- A. Fire-Rated Door Construction: Conform to ASTM E152 NFPA 252 UL 10B WHI.
- B. Installed Door Assembly: Conform to NFPA 80 for fire-rated class as scheduled. as indicated on Drawings.
- C. All door assemblies shall meet the requirements of the State Building and State Fire Codes.

1.7 QUALITY ASSURANCE

- A. Product Performance: Provide documents showing compliance to the following WDMA attributes, validating the specified WDMA Performance Duty Level:
 - 1. Adhesive Bonding Durability: WDMA TM-6
 - 2. Cycle Slam: WDMA TM-7
 - 3. Hinge Loading: WDMA TM-8
 - 4. Screw Holding: WDMA TM-10

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products to job site under provisions of Section 01 60 00 and manufacturer's instructions.
- B. Accept doors at job site in manufacturer's standard packaging. Inspect for damage.
- C. Do not store in damp or wet areas. Cover stored doors with opaque covering material where sunlight might bleach veneer. Seal top and bottom edges if stored more than one week.
- D. Break seal at job site to permit ventilation.
- E. Mark each door on top rail with opening number used on Shop Drawings. Include manufacturer's order number and date of manufacture.
- F. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weather tight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during remainder of construction period.

1.9 FIELD MEASUREMENTS

- A. Verify all dimensions at the site prior to fabrication. Any inconsistencies shall be communicated to the Owner for clarification.

1.10 COORDINATION

- A. Coordinate work under provisions of Section 01 30 00.
- B. Coordinate the work with door opening construction, door frame, hardware and weatherstripping installation.

1.11 WARRANTY

- A. Provide manufacturer's warranty including replacement, refinishing, and rehanging, under provisions of Section 01 78 00 for the "Life of Original Installation" (unlimited lifetime).
- B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, telegraphing core construction.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Subject to compliance with requirements of this Specification Section, provide products listed herein from one of the following:
 - 1. Eggers Industries
 - 2. Lambton Doors
 - 3. Masonite Architectural
- B. Basis of Design: Masonite Architectural
- C. Substitutions: Under provisions of Section 01 60 00.
- D. Supply all wood doors from same manufacturer.

2.2 DOOR DESCRIPTION

- A. Flush interior doors (non-rated): Aspiro™ Series | Marshfield-Algoma Model A-PC-B-NR
 - 1. Provide wood-based particleboard core doors with a minimum density per ANSI A208.1, Grade LD-2 as required to meet WDMA Performance Duty level specified without added blocking.
- B. Flush interior single doors (fire rated): Model A-MC-B-FR45 (3/4 hour rated), A-MC-B-FR60 (1 hour rated), A-MC-B-FR90 (1 ½ hour rated) solid mineral core construction.

2.3 TYPICAL COMPONENTS

- A. Veneer
 - 1. Grade 1 (WDMA Quality grade: Premium)
 - 2. Veneer is to be of sufficient thickness so as not to permit show-through of crossbanding after sanding or finishing.
 - 3. Species: Select white birch
 - 4. Cut: Rotary cut
 - 5. Match between Veneer Leaves: balanced Book match grain.
 - 6. Core: Wood-based Particleboard (PC).
 - 7. Construction: Five plies. Stiles and rails are bonded to core, and then entire unit is abrasive planed before veneering.
 - 8. WDMA I.S.1-A Performance Grade: Heavy Duty.
- B. Thickness
 - 1. 1-3/4 inch thick unless indicated otherwise on the drawings.
- C. Stiles and rails shall be hardwood

2.4 ACCESSORIES

- A. Vision frames:
 - 1. Non-rated: Model W-6 wood of same species as door veneer with mitered corners. (Installed by door manufacturer)
 - 2. Rated: Metal frame as required to conform to door label. Factory primed for field applied paint. (Supplied loose by the door manufacturer)
- B. Glass:
 - 1. Non-rated safety glass shall be provided and installed by the door manufacturer. Glass shall be as specified in Section 08 81 00.
 - 2. Fire rated safety glass shall be provided and shipped loose by the door manufacturer. Glass shall be as specified in Section 08 88 13.
- C. Metal Louvers: Masonite Architectural Model 600A1.
Factory painted finish in color selected by Owner from manufacturer's standard colors.

2.5 FABRICATION

- A. Fabricate doors in accordance with specified manufacturers and WHI and UL requirements.
- B. Laminate door facing, cross banding, and assembled core in a hot press.
- C. Provide non-rated flush doors with stiles of wood species to match face veneer.
- D. Bond stiles and rails to cores. Sand the assembled core for uniform thickness.
- E. Factory sand assembled door leaf.

- F. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware.
- G. Factory fit doors for frame opening dimensions identified on shop drawings.
- H. All fire rated doors shall be fabricated with fire retardant, solid wood inner blocking for positive attachment of all surface mounted hardware. Through-bolts will not be allowed.

2.6 FINISH

- A. Doors to be factory finished with the following: Transparent, WDMA TR-8, UV-Cured Acrylated Polyester/Urethane.
Stained in color and sheen as selected by the Owner from the manufacturer's standard choices, submit samples of colors on wood species selected.
- B. All metal accessories shall receive a prime coat of factory applied baked-on prime coat of paint.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that opening sizes and tolerances are acceptable.
- B. Do not install doors in frame openings that are not plumb or are out of tolerance for size or alignment.

3.2 INSTALLATION

- A. Installation Instructions: Install doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.
- B. Trim non-rated door width by cutting equally on both jamb edges.
- C. Pilot drill screw and bolt holes using templates provided.
- D. Coordinate installation of doors with installation of frames and hardware specified.
- E. Install fire-rated doors according to NFPA 80.
- F. Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - 1. Clearances: Provide 1/8 inch at heads, jambs, and between pairs of doors. Provide 1/8 inch from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch from bottom of door to top of threshold unless otherwise indicated.
 - 2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.

3. Trim bottom rail only to extent permitted by labeling agency.

3.3 INSTALLATION TOLERANCES

- A. Maximum Diagonal Distortion (Warp): 1/4 inch measured with straight edge or taut string, corner to corner, over a maximum 42 x 84 inch surface area.
- B. Maximum Vertical Distortion (Bow): 1/4 inch measured with straight edge or taut string, top to bottom, over a maximum 42 x 84 inch surface area.
- C. Maximum Width Distortion (Cup): 1/4 inch measured with straight edge or taut string, edge to edge, over a maximum 42 x 84 inch surface area.

3.4 ADJUSTING

- A. Adjust door for smooth and balanced door movement.
- B. Operation: Correct any deficiency that prohibits the door from swinging or operating freely. Do not remove hinge screws after initial insertion. Shims used for alignment purposes must be inserted between hinge and frame. Do not insert shims between hinge and door.
- C. To prevent stile failure, insure that door closers are properly adjusted and do not limit the door opening swing. Limit door opening swing only with a properly located stop.
- D. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

SECTION 08 42 13

ALUMINUM ENTRANCE DOORS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Furnish and install aluminum entrance, entrance door frames complete with hardware, and related components as specified in this section.
- B. Glass and Glazing
 - 1. Reference Section 08 81 00 for Glass and Glazing.

1.02 RELATED WORK

- A. Section 07 92 13 - Joint Sealants
- B. Section 08 43 13 – Aluminum Storefront System
- C. Section 08 71 00 - Door Hardware
- D. Section 08 81 00 - Glass and Glazing.

1.03 ITEMS INSTALLED BUT NOT FURNISHED

- A. Structural support of the framing, wood framing and structural steel.

1.04 TESTING AND PERFORMANCE REQUIREMENTS

- A. Air Infiltration: For single acting offset pivot or butt hung entrances in the closed and locked position, the test specimen shall be tested in accordance with ASTM E 283 at a pressure differential of 6.24 psf for single doors and 1.567 psf for pairs of doors. A single 3'0" x 7'0" entrance door and frame shall not exceed 0.50 cfm per square foot. A pair of 6'0" x 7'0" entrance doors and frame shall not exceed 1.0 cfm per square foot.
- B. Structural: Corner strength shall be tested per the Kawneer dual moment load test procedure and certified by an independent testing laboratory to ensure weld compliance and corner integrity
- C. National Fenestration Rating Council (NFRC)
 - 1. NFRC 100; Procedure for Determining Fenestration Thermal Properties:
The conductive thermal transmittance (U-Factor) shall not be more than 0.77 BTU/hr/sf/°F when glazed with 1" insulated – 1/4" clear, 1/2" air, 1/4" clear low emissivity glass.
 - 2. NFRC 200; Solar Heat Gain Coefficient and Visible Transmittance:
Solar Heat Gain Coefficient (SHGC): 0.40

1.05 QUALITY ASSURANCE

- A. Provide test reports from laboratories certifying the performance as specified.

- B. Test reports shall be accompanied by the entrance door manufacturer's letter of certification stating that the tested door meets or exceeds the referenced performance standard for the appropriate door type.

1.06 QUALIFICATIONS

- A. Manufacturer and installer must have specialized in performing the work of this section with a minimum of five (5) years documented experience. Installer must be approved by the manufacturer.

1.07 REGULATORY REQUIREMENTS

- A. Conform to all Federal, State, and Local Codes.

1.08 SUBMITTALS

- A. Submit shop drawings, manufacturer's installation instructions, product data and finish samples under provisions of Section 01 33 00.
- B. Indicate frame configuration, anchor types and spacings, reinforcements, and finish.
- C. Indicate door elevations, closure method, glazing connection, and all accessories.
- D. Provide returnable sample as required by the Owner.
- E. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Protect products under provisions of Section 01 60 00.

1.10 WARRANTIES

- A. Total Entrance Door / Storefront System
 1. Provide warranty under provisions of Section 01 78 00.
 2. The responsible Design/Builder shall assume full responsibility and warrant for one year the satisfactory performance of the total entrance door installation which includes that of the doors, hardware, glass (including insulated units), glazing, anchorage and setting system, sealing, flashing, etc., as it relates to air and structural adequacy as called for in the specifications and approved shop drawings.
 3. Any deficiencies due to such elements not meeting the specifications shall be corrected by the responsible Design/Builder at his expense during the warranty period.
- B. Provide written warranty stating organic coating finish will be free from fading more than 10%, chalking, peeling, chipping, or cracking for 15 years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements of this Specification Section, provide products listed herein from one of the following:
 - 1. EFCO
 - 2. Kawneer Company
 - 3. Oldcastle
- B. Basis of Design: Kawneer Company,
350 Swing Door; Medium stile, 3-1/2" vertical face dimension, 1-3/4" depth.
- C. Substitutions: Under provisions of Section 01 60 00.
- D. Single source requirement: Storefront and entrance doors are to be from a single manufacturer.

2.02 MATERIALS

- A. Aluminum (Entrances and Components):
 - 1. Material Standard: ASTM B 221; 6063-T6 alloy and temper.
 - 2. The door stile and rail face dimensions of the door is as follows:

Door	Vertical Stile	Top Rail	Bottom Rail
350	3-1/2"	3-1/2"	10"
 - 3. Major portions of the door members to be 0.125" nominal in thickness and glazing molding to be 0.05" thick.
 - 4. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of entrance members are nominal and in compliance with Aluminum Standards and Data, published by The Aluminum Association.
- B. Glazing gaskets shall be either EPDM elastomeric extrusions or a thermoplastic elastomer.
- C. Provide adjustable glass jacks to help center the glass in the door opening.
- D. Fasteners: Where exposed, shall be aluminum, stainless steel or plated steel.
- E. Perimeter Anchors: Aluminum. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- F. Glazing: To be 1" insulated glass as specified in Section 08 81 00.

2.03 FINISH

- A. Organic
 - 1. Finish all exposed areas of aluminum doors and components with 70% PVDF Fluropon meeting AAMA 2605.

2. Color shall be as selected by Owner from manufacturer's standard colors.

2.04 HARDWARE

- A. All doors shall be equipped with a Paneline concealed vertical rod exit device or rim exit device with the release mechanism contained in a nominal 8" mid-rail. The release mechanism shall be clearly marked, with the word "PUSH" but shall not extend more than 1 1/8" beyond the plane of the door in the unactivated position. Doors shall have a 9" offset pull handle (Style CO-9) on the exterior. Provide key cylinder dog-down.
 1. Provide at all new exterior aluminum entrance doors an electric strike for a rim exit device or an electrified latch retraction system for concealed vertical rod exit devices as required for unlocking the door with an adjacent card/proximity reader. Only one leaf (right side from exterior) on a pair of doors is to have the unlocking device.
Provide and install all wiring and power supplies or transformers as required for a complete operating system.
Connect with card/proximity reader at exterior of each door.
- B. Hinges to be full height continuous Roton Model 780-112 HD or equal. Finish to match door.
- C. Closers to be standard manufacturer's concealed type with a limiting stop and a hold open. Closer must meet the state code for opening force and swing position.

2.05. WEATHERSTRIPPING

- A. The door weatherstripping on a single acting door and frame shall be Kawneer Sealair® weatherstripping. This is comprised of a thermoplastic elastomer weatherstripping on a tubular shape with a semi-rigid polymeric backing.
- B. Meeting stiles on pairs of doors shall be equipped with an adjustable astragal utilizing wool pile with polymeric fin.
- C. Sill Sweep Strips: EPDM blade gasket sweep strip in an aluminum extrusion applied to the interior exposed surface of the bottom rail with concealed fasteners.
- D. Threshold: Extruded aluminum, thermally broken, one piece per door opening width, with ribbed surface. Must be maximum 1/2" height and meet state code accessibility requirements.

2.06 FABRICATION

- A. Entrance System Fabrication:
 1. Door corner construction shall consist of mechanical clip fastening, SIGMA deep penetration plug welds and 1-1/8" long fillet welds inside and outside of all four corners. Glazing stops shall be hook-in type with EPDM glazing gaskets reinforced with non-stretchable cord.
 2. Accurately fit and secure joints and corners. Make joints hairline in appearance.
 3. Prepare components with internal reinforcement for door hardware.
 4. Arrange fasteners and attachments to conceal from view.

- B. Fabrication Tolerances: Fabricate aluminum entrances in accordance with entrance manufacturer's prescribed tolerances.

PART 3 EXECUTION

3.01 INSPECTION

- A. Job Conditions
 - 1. Verify that openings are dimensionally within allowable tolerances, plumb, level, clean, provide a solid anchoring surface, sill plate is level, and all conditions are in accordance with approved shop drawings.

3.02 INSTALLATION

- A. Install entrance system in accordance with manufacturer's instructions and AAMA storefront and entrance guide specifications manual.
- B. Use only skilled tradesmen with work done in accordance with approved shop drawings and specifications.
- C. Plumb and align entrance door faces in a single plane for each wall plane and erect doors and materials square and true. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.
- D. Adjust doors for proper operation after installation.
- E. Furnish and apply sealants to provide a weather tight installation at all joints and intersections and at opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.
- F. Install glass in accordance with Glass and Glazing Section 08 81 00.

3.03 CLEANING

- A. Entrance doors shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc.
- B. The Design/Builder shall be responsible for cleaning all aluminum, employing methods recommended by the manufacturer as follows: Anodized aluminum shall be cleaned with plain water containing a mild detergent, or a petroleum product such as white gasoline, kerosene, or distillate. No abrasive agent shall be used. Remove construction debris from project site and legally dispose of debris.
- C. Glass shall be cleaned thoroughly.

3.04 PROTECTION OF FINISHED WORK

- A. Protect finished work under provisions of Section 01 70 00.

- B. Protect installed product's finish surfaces from damage during construction. Protect aluminum entrances from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants. Remove and replace damaged aluminum entrance components as required at no extra cost to the Owner.

END OF SECTION

SECTION 08 43 13

ALUMINUM STOREFRONT SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish and install aluminum architectural storefront system complete with hardware and related components as specified in this section.

1.02 RELATED WORK

- A. Section 07 92 13 - Joint Sealants
- B. Section 08 42 13 - Aluminum Entrance Doors
- C. Section 08 81 00 - Glass and Glazing.

1.03 TESTING AND PERFORMANCE REQUIREMENTS

- A. Provision for Thermal Movements
 - 1. Storefront framing systems shall be designed to provide for thermal movement of all component materials resulting from a surface temperature change of 180 degrees F without causing buckling, stresses on glass, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or other detrimental effects. Operating windows and doors shall function normally over this temperature range.
- B. Test Procedures and Performance
 - 1. Air Infiltration: The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft² (0.3 l/s • m²) at a static air pressure differential of 6.24 psf (300 Pa).
 - 2. Water Resistance: The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a minimum static air pressure differential of 8 psf (383 Pa) as defined in AAMA 501.
 - 3. Uniform Load: A static air design load of 20 psf (958 Pa) shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.
 - 4. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than:
 - a. Glass to Exterior – 70_{frame} and 69_{glass} (low-e) or 69_{frame} and 58_{glass} (clear).
 - b. Glass to Center – 62_{frame} and 68_{glass} (low-e) or 63_{frame} and 56_{glass} (clear).
 - c. Glass to Interior – 56_{frame} and 67_{glass} (low-e) or 54_{frame} and 58_{glass} (clear).
 - 5. National Fenestration Rating Council (NFRC)
 - a. NFRC 100; Procedure for Determining Fenestration Thermal Properties: The conductive thermal transmittance (U-Factor) shall not be more than 0.38 BTU/hr/sf/°F when glazed with 1" insulated – 1/4" clear, 1/2" air, 1/4" clear low emissivity glass.

- b. NFRC 200; Solar Heat Gain Coefficient and Visible Transmittance:
Solar Heat Gain Coefficient (SHGC): 0.40

1.04 ENGINEERING REQUIREMENTS

- A. Systems shall be engineered to the following requirements and evidence, in the form of drawings and calculations, shall be delivered to the Owner for approval. All calculations and drawings shall be approved and stamped by a registered engineer.
 - 1. Window wall framing members to be designed to withstand 30 psf positive and 30 psf negative wind loads up to and including a 50 foot height above ground and increasing acting normal to plane of wall.
 - 2. Wall so constructed as to provide for such expansion and/or contraction of component materials as will be caused by an ambient temperature range of 140 degrees f. without causing harmful buckling, failure of joint seals, and undue stress on fasteners or other detrimental effects.
 - 3. The calculated deflection of any metal framing member in a directional normal to the plane of the wall shall not exceed 1/175'th of it's clear span or ¾ inch, whichever is less, except that when a finished plaster type surface is affected, the deflection shall not exceed 1/360'th of the span.
- B. Design, engineer, fabricate and install the storefront system to withstand the effects of wind loading specified with no material failures or permanent deformation of structural members.
- C. Structural test pressure shall be equal to 150 percent of the inward and outward acting design wind pressures.

1.05 QUALITY ASSURANCE

- A. Provide test reports from AAMA accredited laboratories certifying the performance as specified in.
- B. Test reports shall be accompanied by the storefront manufacturer's letter of certification stating that the tested storefront meets or exceeds the referenced criteria for the appropriate storefront type.

1.06 REFERENCES

- A. AAMA - American Architectural Manufacturer's Association.
- B. ASTM - American Society for Testing and Materials.

1.07 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Drawings shall show scale elevations and sections. Full size sections shall be shown only when needed for clarity. Drawings shall show construction of all parts of the work, including metal and glass thickness, methods of joining, details of all field connections and anchorage, fastening and

sealing methods, metal finishes and all pertinent information. Relationship to other work should be clearly indicated. No work shall be fabricated until shop drawings for that work have been finally approved for fabrication.

- C. Design/Builder shall submit finish samples, test reports, and warranties.
 - 1. Samples of materials as may be requested by the Owner without cost to Owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, corner section, etc.

1.08 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing aluminum storefront systems with minimum five years of experience.
- B. Installer: A commercial glazer with not less than five years of experience installing similar glazing systems and approved by the system manufacturer.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
- B. Accept window units on site in original cartons. Inspect for damage.
- C. Protect window units from damage by other trades and damage to finish.

1.10 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.

1.11 WARRANTIES

- A. Provide two year warranty under provisions of Section 01 78 00.
- B. Include coverage for repair or replacement of any defective units or materials, to the satisfaction of and at no cost to the owner. Failure includes but is not limited to water leakage, excessive air infiltration, excessive deflections, faulty operation of sash or deterioration of the finish in excess of normal weathering and defects in hardware, weatherstripping and all other components of the completed project.
- C. Include coverage from the insulating glass manufacturer agreeing to replace, at no cost to the owner, any sealed insulating glass units which fail within five years of manufacture. Failure shall include but not be limited to fog, mist, condensation, or dust which appears on the #2 or #3 surfaces of the insulated glass unit.
- D. Provide written warranty stating organic coating finish will be free from fading more than 10%, chalking, peeling, chipping, or cracking for 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements of this Specification Section, provide products listed herein from one of the following:
 - 1. EFCO
 - 2. Kawneer Company
 - 3. Oldcastle
- B. Basis of Design: Kawneer Company,
Model: Trifab VG 451T thermal storefront
- C. Substitutions: Under provisions of Section 01 60 00.
- D. Single source requirement: Storefront and entrance doors are to be from a single manufacturer.

2.02 MATERIALS

- A. Aluminum
 - 1. Extruded aluminum shall be ASTM B 221, 6063-T6 alloy and temper.
- B. Glass
 - 1. Glazing shall be 1" insulated, tempered glass as specified in Section 08 81 00.
- C. Dissimilar Metals
 - 1. All dissimilar metals must be properly insulated to prevent galvanic action.
- D. Fasteners
 - 1. All exposed fasteners shall be aluminum or stainless steel.
- E. Thermal Barrier
 - 1. Barrier material shall be poured in place, two-part polyurethane. A nonstructural thermal barrier is unacceptable.

2.03 FABRICATION

- A. General
 - 1. All aluminum frame extrusions shall have a minimum wall thickness of .080".
 - 2. All exposed work shall be carefully matched to produce continuity of line and design with all joints. System design shall be such that raw edges will not be visible at joints.
 - 3. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.
 - 4. Fabricate components per manufacturer's installation instructions and with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
 - 5. Accurately fit and secure joints and corners. Make joints flush, hairline and weatherproof.

6. Prepare components to receive anchor devices. Fabricate anchors.
7. Arrange fasteners and attachments to conceal from view.
- B. Frame
 1. Depth of frame shall not be less than 4 1/2".
 2. Face dimension shall not be less than 2".
 3. Frame components shall be screw spline construction.
- C. Glazing
 1. All units shall be "dry glazed" with EPDM gasket on both exterior and interior.
- D. Provide Kawneer HP-037 sill flashing under the sill framing.
- E. Interior trim, closures, angles and the like shall be of sizes and shapes as required with fastenings as required and/or specified. All snap-on design trim shall be in 0.062 inch minimum thickness. Trim shall connect to extruded aluminum anchors which shall permit the window to be anchored without the use of fasteners thru frame which may permit air or water leakage. Trim shall be of adequate size to cover all exposed areas and to preclude painting due to installation of new materials.
- F. Set trim in full bed of sealant and seal all corners of panning trim from inside or with clear silicone ribbon from exterior. Leave installation in a clean, neat condition.
- G. Frame Finish
 1. Organic
 - a. Finish all exposed areas of aluminum doors and components with Fluropon 70% PVDF meeting AAMA 2605, Fluoropolymer coating.
 - b. Color shall be as selected by Owner from manufacturer's standard colors.
- H. Exterior panning – aluminum, 0.078 inch thickness to cover all existing framing if existing to remain; one piece design to abut or interlock into frames without use of exposed fasteners; weathertight connection to allow for expansion and contraction.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Job Conditions
 1. All openings shall be prepared by others to the proper size and shall be plumb, level and in the proper location and alignment.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions and recommendations and AAMA storefront and entrance guide specifications manual.. Match profiles, sizes and spacings indicated on approved shop drawings. Do not perform structural silicone sealant work when the metal temperature is below 32 degrees F.

- B. Storefront system shall be erected plumb and true, free of warp and twist in proper alignment and relation to established lines and grades of adjacent work.
- C. Entrance doors shall be securely anchored in place to a straight, plumb and level condition, without distortion. Weather stripping contact and hardware movement shall be checked and final adjustments made for proper operation and performance of units.
- D. Furnish and apply sealing materials to provide a weather tight installation at all joints and intersections and at opening perimeters. Install sill members and other members in a bed of sealant or with joint filler or gaskets, to provide weathertight construction. Coordinate installation with wall flashings and other components of construction.
- E. Sealing materials specified shall be used in strict accordance with the manufacturer's printed instructions, and shall be applied only by mechanics specially trained or experienced in their use. All surfaces must be clean and free of foreign matter before applying sealing materials. Sealing compounds shall be tooled to fill the joint and provide a smooth finished surface.
- F. Coordinate installation with adjacent work to ensure creation of a complete weatherproof assembly. Anchor work securely to supporting structure, but allow for differential and thermal movement.
- G. Isolate between aluminum and dissimilar metals with a protective coating or plastic strip to prevent electrolytic corrosion.
- H. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- I. Provide alignment attachments and shims to permanently fasten system to building structure.

3.03 ANCHORAGE

- A. Adequately anchor to maintain positions permanently when subjected to normal thermal movement, specified building movement, and specified wind loads.
- B. Provide fasteners as recommended by the manufacturer for the type of substrate the storefront system is to be anchored.

3.04 CLEANING AND PROTECTION

- A. During installation, remove labels, part number markings, sealant smears, handprints, and construction dirt from all components.
- B. Touch-up damaged coatings and finishes and repair minor damage to eliminate all evidence of repair. Remove and replace work which cannot be satisfactorily repaired.
- C. Clean all exposed surfaces including metal and glass using non-abrasive materials and methods recommended by manufacturer of material or product being cleaned. Remove and replace work that cannot be successfully cleaned.

- D. The Design/Builder shall protect the aluminum materials and finish against damage from construction activities and harmful substances. Protect aluminum storefront system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.

END OF SECTION

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SECTION 08 51 13

ALUMINUM-CLAD WOOD WINDOWS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Aluminum-clad wood double-hung, awning and fixed windows.

1.2 RELATED SECTIONS

- A. Section 07 92 13 - Joint Sealants: Sealants and caulking.

1.3 REFERENCES

- A. American Architectural Manufacturers Association (AAMA):
 - 1. AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Doors.
 - 2. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
 - 3. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM B 117 - Operating Salt Spray (Fog) Apparatus.
 - 2. ASTM C 1036 - Flat Glass.
 - 3. ASTM C 1048 - Heat-Treated Flat Glass – Kind HS, Kind FT Coated and Uncoated Glass.
 - 4. ASTM D 1149 - Rubber Deterioration – Surface Ozone Cracking in a Chamber.
 - 5. ASTM D 2803 - Filiform Corrosion Resistance of Organic Coatings on Metal.
 - 6. ASTM D 3656 - Insect Screening and Louver Cloth Woven from Vinyl-Coated Glass Yarns.
 - 7. ASTM D 4060 - Abrasion Resistance of Organic Coatings by the Taber Abraser.
 - 8. ASTM E 283 - Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Difference Across the Specimen.
 - 9. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
 - 10. ASTM E 547 - Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differential.
 - 11. ASTM G 85 - Modified Salt Spray (Fog) Testing.
- C. Screen Manufacturers Association (SMA):
 - 1. SMA 1201 - Specifications for Insect Screens for Windows, Sliding Doors and Swinging Doors.
- D. Window and Door Manufacturers Association (WDMA):
 - 1. ANSI/AAMA/NWDA 101/I.S.2 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.
 - 2. ANSI/AAMA/NWDA 101/I.S.2/NAFS-02 - Voluntary Performance Specification for Windows, Skylights and Glass Doors.
 - 3. WDMA I.S.4 - Industry Standard for Water-Repellent Preservative Non-Pressure Treatment for Millwork.

1.4 PERFORMANCE REQUIREMENTS

- A. Windows shall be Hallmark certified to a rating of H-LC-PG CW50 specifications for the double hung windows and AP-CW-PG50 for the awning windows in accordance with ANSI/AAMA/NWDA I.S.2/A440-08.
- B. Window Unit Air Leakage, ASTM E 283, 1.57 psf (25 mph): 0.5 cfm per square foot of frame or less.
- C. Window Unit Water Penetration: No water penetration through window unit when tested in accordance with ASTM E 547, under static pressure of 7.5 psf (52 mph) after 4 cycles of 5 minutes each, with water being applied at a rate of 5 gallons per hour per square foot.
- D. Thermal Transmittance Test (Conductive U-Value)
 - a. Operable unit
 - 1. With ventilators closed and locked, test unit in accordance with NFRC - 102.
 - 2. Conductive thermal transmittance (U-Value) shall not be more than 0.45 BTU/hr•ft²•°F when glazed with 1" insulated – 1/4" clear, 1/2" air, 1/4" clear low emissivity glass.
 - b. Fixed unit
 - 1. Test unit in accordance with NFRC - 102.
 - 2. Conductive thermal transmittance (U-Value) shall not be more than 0.38 BTU/hr•ft²•°F when glazed with 1" insulated – 1/4" clear, 1/2" air, 1/4" clear low emissivity glass.
- E. Solar Heat Gain Coefficient
 - a. All glazing is to have a SHGC of 0.40 or less as determined by NFRC - 200.

1.5 REGULATORY REQUIREMENTS

- A. Conform to all applicable Federal, State and local codes and laws.

1.6 Field Measurements

- A. Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication scheduled with construction progress to avoid construction delays.

1.7 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's product data, including installation instructions.
- C. Shop Drawings: Submit manufacturer's shop drawings, indicating dimensions, construction, component connections and locations, anchorage methods and locations, hardware locations, and installation details.
- D. Samples: Submit full-size or partial full-size sample of window illustrating glazing system, quality of construction, and color of finish.
- E. Submit certification of the U-value and the Solar Heat Gain Coefficient confirming compliance with the requirements set forth in this specification.
- F. Warranty: Submit manufacturer's standard warranty for all components and finishes.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
- B. Delivery: Deliver materials to site undamaged in manufacturer's or sales branch's original, unopened containers and packaging, with labels clearly identifying manufacturer and product name. Include installation instructions.
- C. Storage: Store materials in an upright position, off ground, under cover, and protected from weather, direct sunlight, and construction activities.
- D. Handling: Protect materials and finish during handling and installation to prevent damage.

1.9 WARRANTY

- A. Provide manufacturer's standard warranty for the specified products and finishes under the provisions of Section 01 78 00.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Pella Corporation, 102 Main Street, Pella, Iowa 50219.
Toll Free (800) 54-PELLA. Phone (641) 621-1000. Website www.pella.com.
- B. Substitutions: Under provisions of Section 01600.

2.2 ALUMINUM-CLAD WOOD WINDOWS

- A. Window Types
 - 1. Aluminum-Clad Wood Double-Hung Windows: Architect Series Traditional factory-assembled aluminum-clad wood double-hung windows. Sash shall tilt to interior without removal for cleaning.
 - 2. Aluminum-Clad Wood Awning Windows: Architect Series Traditional factory-assembled aluminum-clad wood windows with outward-opening sash installed in frame.
 - 3. Aluminum-Clad Wood Fixed-Frame Windows: Pella "Clad Frame" factory-assembled, aluminum-clad wood, fixed-frame windows.
- B. Frame:
 - 1. Select softwood, water-repellent, preservative-treated with EnduraGuard® in accordance with WDMA I.S.-4. EnduraGuard includes water-repellency, three active fungicides and an insecticide applied to the frame.
 - 2. Interior Exposed Surfaces: Clear Pine with no visible fastener holes..
 - 3. Exterior Surfaces: Clad with aluminum.
 - 4. Overall Frame Depth: 5 inches.
- C. Sash:
 - 1. Select softwood, water water-repellent, preservative-treated with EnduraGuard in accordance with WDMA I.S.-4. EnduraGuard includes water-repellency, three active fungicides and an insecticide applied to the sash.

2. Interior Exposed Surfaces: Clear Pine with no visible fastener holes..
3. Exterior Surfaces: Clad with aluminum, lap-jointed at corners.
4. Corners: Mortised and tenoned, glued and secured with metal fasteners.
5. Double hung: Operable sash tilt to interior for cleaning or removal.
6. Double hung: Extruded acrylonitrile butadiene styrene glazing flange. Flange is located on top of wood sash members and under exterior aluminum cladding.
7. Sash Thickness: 1-3/4 inches.

D. Weather Stripping:

Double Hung:

1. Water-stop santoprene wrapped foam at head and sill.
2. Thermal-plastic elastomer bulb with slip coating set into lower sash for tight contact at checkrail.
3. Vinyl-wrapped foam inserted into jambliner or jambliner components to seal to sides of sash.

Awning:

1. Dual weather stripping.
2. Continuous, flexible, Santoprene material in dual-durometer design.
3. Units shall have welded corners, compressed between frame and sash for positive seal on all 4 sides.
4. Secondary PVC leaf-type weather strip between sash and frame for positive seals on all 4 sides.

2.3 GLAZING

A. Glazing:

1. Type: Silicone-glazed 5/8-inch dual-seal, tempered as required by code, insulating glass, air-filled multi-layer, Low-E coated. Glass tinted in color selected by Owner from manufacturer's standard colors.
2. Integral Light Technology Glazing and Grilles:
 - a. Insulating glass contains non-glare grid between 2 panes of glass.
 - b. Non-glare Grid: Adhered to glass.
 - c. Room Side Grilles: Solid 7/8-inch wide Clear Pine.
 - d. Exterior Grilles: Extruded aluminum. Dimension to match room side grilles.
 - e. Bars shall be adhered to both sides of insulating glass with VHB acrylic adhesive tape and aligned with non-glare grid.
 - f. Finish: Finish color matches interior and exterior finish colors.
 - g. Grille style selected by Owner from manufacturer's standard range.

2.4 ACCESSORIES

A. Insect Screens: Vivid View®.

1. Compliance: ASTM D 3656 and SMA 1201.
2. Screen Cloth: Vinyl-coated fiberglass, 21/17 mesh, with minimum 78 percent light transmissivity.
3. Set in aluminum frame.
4. Complete with necessary hardware.
5. Screen Frame Finish: Baked enamel.
 - a. Color: Selected by Owner from manufacturer's standard colors.

2.5 HARDWARE

A. Double Hung Windows:

1. Balances:
 - a. Block-and-tackle balances.
 - b. Balances are attached to frame and connected to sash with polyester cord.
2. Locking System:
 - a. Self-aligning sash lock factory-installed.
 - b. One installed on units with frame width less than 37 inches, 2 locks installed on units with frame width of 37 inches or greater.
3. Sash Lifts:
 - a. Sash lift furnished for field installation.
 - b. One sash lift on units with frame width less than 37 inches, 2 sash lifts on units with frame width of 37 inches or greater.
4. Lock and Sash Lift Finish: Selected by Owner from manufacturer's standard colors.
5. Limited Opening Device: Factory applied in stainless steel device concealed from view. Nominal 3-3/4" opening.

B. Awning Windows

1. Operator:
 - a. Steel worm-gear operator with hardened gears.
 - b. Operator Base: Zinc die cast with painted finish.
 - c. Operator Linkage, Hinge Slide, and Hinge Arms: Stainless steel.
 - d. Exposed Fasteners: Stainless steel.
 - e. External Hardware Salt Spray Exposure, ASTM B 117: Exceed 1,000 hours.
2. Crank Handle Finish
 - a. Integrated Folding Crank: Selected by Owner from manufacturer's standard colors.
3. Locking System: SureLock System.
 - a. Single-handle locking system.
 - b. Operate positive-acting arms that reach out and pull sash into locked position.
 - c. Awning Windows: One installed on sash 29 inches and smaller in frame width, 2 unison operating locks installed on sash over 29 inches in frame width.
 - d. Lock Handle Finish: Selected by Owner from manufacturer's standard colors.

2.6 TOLERANCES

- A. Windows shall accommodate the following opening tolerances:**
1. Vertical Dimensions Between High and Low Points: Plus 1/4 inch, minus 0 inch.
 2. Width Dimensions: Plus 1/4 inch, minus 0 inch.
 3. Building Columns or Masonry Openings: Plus or minus 1/4 inch from plumb.

2.7 FINISH

- A. Exterior Finish System: Pella EnduraClad Plus.**
1. Exterior aluminum surfaces shall be finished with the following multi-stage system:
 - a. Clean and etch aluminum surface of oxides.
 - b. Pre-treat with chrome phosphate conversion coating.
 - c. Pre-treat with chromic acid sealer/rinse.
 - d. Top coat with baked-on 70% fluoropolymer-based enamel.
 2. Color: Selected by Owner from manufacturer's standard White, Tan, Brown or Putty colors.

3. Performance Requirements: Exterior aluminum finishes shall meet or exceed all performance requirements of AAMA 2605.
 - B. Exterior Finish System Performance Requirements: Pella EnduraClad Plus.
 1. Exterior aluminum finishes shall meet or exceed following performance requirements:
 - a. Ozone Deterioration, ASTM D 1149, Modified: 5 ppm ozone, 160 degrees F, 60 percent relative humidity, 100 hours exposure, little or no loss of cure.
 - b. Filiform Corrosion Resistance of Organic Coatings on Metal, ASTM D 2803: No corrosion.
 - c. Taber Abrasion Resistance, ASTM D 4060: 500 g weight, CS-10 wheel, 500 cycles, less than 25 g weight loss.
 - d. Cyclic Acidified Salt Fog Test, ASTM G 85, Appendix A-2.
 - C. Interior Finish: Factory-primed with 1 coat acrylic latex.
- 2.8 INSTALLATION ACCESSORIES
- A. Flashing/Sealant Tape: Pella SmartFlash.
 1. Aluminum-foil-backed butyl window and door flashing tape.
 2. Maximum Total Thickness: 0.013 inch.
 3. UV resistant.
 4. Verify sealant compatibility with sealant manufacturer.
- 2.9 SOURCE QUALITY CONTROL
- A. Factory Testing: Factory test individual standard operable windows for air infiltration in accordance with ASTM E 283, to ensure compliance with this specification.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive windows. Notify Owner of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Install windows in accordance with manufacturer's instructions and approved shop drawings.
- B. Install windows to be weather-tight and freely operating.
- C. Maintain alignment with adjacent work.
- D. Secure assembly to framed openings, plumb and square, without distortion.
- E. Integrate window system installation with exterior weather-resistant barrier using flashing/sealant tape. Apply and integrate flashing/sealant tape with weather-resistant barrier using watershed principles in accordance with window manufacturer's instructions.
- F. Place interior seal around window perimeter to maintain continuity of building thermal and air barrier using insulating-foam sealant.
- G. Seal window to exterior wall cladding with sealant and related backing materials at perimeter of

assembly.

- H. Leave windows closed and locked.

3.3 CLEANING

- A. Clean under provisions of Section 01 70 00.
- B. Clean window frames and glass in accordance with Division 1 requirements.
- C. Do not use harsh cleaning materials or methods that would damage finish.
- D. Remove labels and visible markings.

3.4 PROTECTION

- A. Protect installed windows to ensure that, except for normal weathering, windows will be without damage or deterioration at time of substantial completion.

END OF SECTION

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SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
 - 2. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Cylinders specified for doors in other sections.
 - 3. Electromechanical door hardware, power supplies, back-ups and surge protection.
- C. Related Sections:
 - 1. Section 08 12 13 - Steel Door Frames
 - 2. Section 08 13 13 - Steel Doors
 - 3. Section 08 14 16 – Wood Doors
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.
 - 6. NFPA 105 - Installation of Smoke Door Assemblies.
 - 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series
 - 2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes. Submit under provisions of Section 01 33 00.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 - 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Operating and Maintenance Manuals: Provide manufacturer's operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.
- D. Warranties and Maintenance: Special warranties specified in this Section.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing both standard and electrified builders hardware similar in material,

design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor in good standing by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Design/Builder and Owner concerning both standard and electromechanical door hardware and keying.

1. Scheduling Responsibility: Preparation of door hardware and keying schedules.

- D. Source Limitations: Obtain each type and variety of Door Hardware specified in this Section from a single source, qualified supplier unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

- E. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:

1. NFPA 70 "National Electrical Code", including electrical components, devices, and accessories listed and labeled as defined in Article 100 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
2. Where indicated to comply with accessibility requirements, comply with the Rhode Island Building Code and the Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
 - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
 - 1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
 - 2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.
3. NFPA 101: Comply with the following for means of egress doors:
 - a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
 - b. Thresholds: Not more than 1/2 inch high.

4. Fire-Rated Door Assemblies: Provide door hardware for 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 (neutral pressure at 40" above sill) or UL-10C.

- a. Test Pressure: Positive pressure labeling.

F. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Design/Builder(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, arrange for manufacturers' representatives to hold a project specific training meeting to instruct the installing Design/Builders' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
- B. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- C. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

- D. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
- C. Field verify all dimensions and locations prior to shop drawing submittal.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Design/Builder under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturers, agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner, this includes all labor required to repair or replace product. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Ten years for extra heavy duty cylindrical (bored) locks and latches.
 - 2. Seven years for heavy duty cylindrical (bored) locks and latches.
 - 3. Five years for exit hardware.
 - 4. Ten years for manual door closers.
 - 5. Two years for electromechanical door hardware.

1.8 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
1. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3.
 - a. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements.
The hardware schedule is based on the following manufacturers:
 1. Locks, passage & privacy sets-Sargent
 2. Exit devices - Sargent
 3. Continuous hinge - Roton by Hager Hinge Co.
 - B. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in AIA Document A701 – Instructions To Bidders and Division 01, Section 01 60 00, Substitution Procedures. Approval of requests is at the discretion of the owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.
1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'-0": provide 4-1/2" x 4-1/2" standard hinges.

- b. NOTE: 42" door widths are to use continuous geared hinges even if the hardware schedule at the end of Part 3 lists the hinge as "butts".
- 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Provide continuous gear hinges.
 - b. Interior Doors: Standard weight, steel, ball bearing hinges unless Hardware Sets indicate heavy weight.
- 4. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:
 - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
 - 1) Doors out-swinging into corridors.
- 5. Acceptable Manufacturers:
 - a. Bommer Industries (BO).
 - b. Hager Companies (HA).
 - c. McKinney Products (MK).
 - d. Stanley Hardware (ST).
- B. Continuous Geared Hinges: ANSI/BHMA A156.26 certified continuous geared hinge with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Provide concealed flush mount (with or without inset), full surface, or half surface, in standard and heavy duty models, as specified in the Hardware Sets. Concealed continuous hinges to be U.L. listed for use on up to and including 90 minute rated door installations and U.L. listed for windstorm components where applicable. Factory cut hinges for door size.

Basis of design: Roton model 780-111 HD unless noted otherwise.

- 1. Acceptable Manufacturers:
 - a. Roton by Hager Hinge Co. (RO)
 - b. Bommer Industries (BO).
 - c. McKinney Products (MK).
 - d. Pemko Manufacturing (PE).
 - e. Stanley Hardware (ST).
 - f. Select Hinges (SH)

2.3 DOOR OPERATING TRIM

- A. Flush Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified automatic, self-latching, and manual flush bolts. Manual flush bolts to be furnished with top rod of sufficient length to allow bolt location approximately six feet from the floor. Furnish dust proof strikes for bottom bolts. Surface bolts to be minimum 8" in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components

where applicable. Furnish a dustproof floor strike for each bottom bolt. Provide related accessories (mounting brackets, strikes, door to door thermal pins, coordinators, etc.) as required for appropriate installation and operation.

1. Acceptable Manufacturers:

- a. Burns Manufacturing (BU).
- b. Door Controls International (DC).
- c. Ives (IV).
- d. Rockwood Manufacturing (RO).
- e. Trimco (TC).

B. Coordinators: ANSI/BHMA A156.3 certified door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Coordinators fabricated from steel with nylon-coated strike plates and built-in adjustable safety release.

1. Acceptable Manufacturers:

- a. Burns Manufacturing (BU).
- b. Door Controls International (DC).
- c. Ives (IV).
- d. Rockwood Manufacturing (RO).
- e. Trimco (TC).

C. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified below or in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

- 1. Push/Pull Plates: Minimum .050 inch thick, 4-inches wide by 16-inches high, stainless steel with square corners and beveled edges, secured with exposed screws unless otherwise indicated.
- 2. Straight Pull Design: Minimum 1-inch round diameter stainless steel tube stock pulls with 2 1/2-inch clearance from face of door. Length to be 10" center to center. Attach with concealed fasteners as required for door type. All pulls will include an associated plate.
- 3. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets. All fasteners used for attachment are to be of anti-theft design.
- 4. Acceptable Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Hiawatha, Inc. (HI).
 - c. Ives (IV).
 - d. Rockwood Manufacturing (RO).
 - e. Trimco (TC).
 - f. Hager Companies (HA).

D. Kickplates shall be 10" high x 2" less than nominal door width, .050" thick stainless steel. All fasteners used for attachment are to be of anti-theft design.

1. Acceptable Manufacturers:

- a. Burns Manufacturing (BU).

- b. Hiawatha, Inc. (HI).
- c. Ives (IV).
- d. Rockwood Manufacturing (RO).
- e. Trimco (TC).
- f. Hager Companies (HA).

2.4 CYLINDERS AND KEYING

- A. Locks shall be grandmaster keyed as directed by the Owner.
- B. Supply two keys for each lock and 5 master keys for each master key grouping.
- C. Provide all keys of nickel silvermetal only.
- D. Hardware consultant shall meet with owner to determine specific keying requirements and functions of locks.

2.5 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified cylindrical (bored) locksets **and be tested by an independent third party testing agency to meet a minimum of 10 million cycle tests** furnished in the functions as specified in the Hardware Sets. Lock chassis fabricated of heavy gauge steel, zinc dichromate plated, with through-bolted application. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt. Locks are to be non-handed and fully field reversible.
 - 1. Locksets to incorporate a free-wheeling lever design with a lifetime warranty against lever sag and spring breakage on all locking functions.
 - 2. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) – CL3300 Series.
 - b. Sargent Manufacturing (SA) – 10 Line.
 - c. Schlage (SC) – ND Series.
 - 3. Lever shall be "L" and L Rose or equal from acceptable manufacturers.
 - 4. Cylinders: Sargent high security interchangeable core 6-pin or equal.
 - 5. Tactile warning - Levers shall be KNURLED or MILLED at doors leading into all hazardous locations (ie. electric rooms, mechanical rooms, elevator machine rooms). Do not use abrasive coating or applied tape in lieu of knurling or milling.
- B. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Security Grade 1 certified mortise locksets **and be tested by an independent third party testing agency to meet a minimum of 10 million cycle tests** furnished in the functions as specified in the Hardware Sets. Lock chassis fabricated of heavy gauge steel, zinc dichromate plated, with through-bolted application. Furnish with

solid cast levers, standard 2 3/4" backset, and 3/4" throw anti-friction stainless steel latch. Deadbolts, where specified, are to be full 1" throw made of one-piece hardened stainless steel. Locks are to be non-handed and fully field reversible.

1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) – ML2000 Series.
 - b. Sargent Manufacturing (SA) – 8200 Series.
 - c. Schlage (SC) – L9000 Series.
2. Sargent 8200 series with "L" lever and 2" Dia. "LN" rosette or equal subject to provisions of Section 01600.
3. Cylinders: Sargent 7300 series high security interchangeable core 6-pin.

2.6 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
3. Except on fire rated doors, provide exit devices with keyed cylinder dogging to hold the pushbar and latch in a retracted position.
4. Flush End Caps: Provide heavy weight impact resistant flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.
5. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty trim with cold forged escutcheons, beveled edges, and four threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide design to match that of the specified locksets. Provided free-wheeling type trim.
 - b. Where function of exit device requires a cylinder, provide an interchangeable core type keyed cylinder (Rim or Mortise) as specified.
6. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.
7. Rail Sizing: Provide exit device rails factory sized for proper door width application.
8. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
9. Lever handle design shall be Sargent type "L" or equal.

10. Provide a Fusible Alignment Pin (Thermal Pin) on all pairs of fire rated doors with exit devices that do not have bottom vertical rods. (not required on 20 minute rated doors)

- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets **and be tested by an independent third party testing agency to meet a minimum of 10 million cycle tests**. Mounting rails to be formed from smooth stainless steel, brass or bronze architectural materials no less than 0.072" thick, with push rails a minimum of 0.062" thickness. Painted or aluminum metal rails are not acceptable. Exit device latch to be investment cast stainless steel, pullman type, with deadlock feature.

1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
 - b. Sargent Manufacturing (SA) - 80 Series.
 - c. Von Duprin (VD) - 35A/98/99 XP Series.
 - d. Precision Apex 2000 Series.

2.7 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
 1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
 2. Standards: Closers to comply with UL-10C and UBC 7-2 for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
 3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
 4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 - a. Closers shall not be installed on exterior or corridor side of doors; where possible, install the closers on door for optimum aesthetics. Provide drop plates or other accessories as required for proper mounting.
 5. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for a complete installation.
- B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers **and be tested by an independent third party testing agency to meet a minimum of 5 million cycle tests**, with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate

non-critical valves for closing sweep and latch speed control. Provide non-handed units and high impact, non-corrosive plastic covers standard.

1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DC7500 Series.
 - b. LCN Closers (LC) - 4040XP Series.
 - c. Sargent Manufacturing (SA) - 351 Series.
 - d. Norton Door Controls (NO) - 7500 Series.

2.8 DOOR STOPS

- A. General: Door stops to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic.

1. Acceptable Manufacturers:
 - a. Hiawatha, Inc. (HI).
 - b. Ives (IV).
 - c. Rockwood Manufacturing (RO).
 - d. Trimco (TC).

2.9 OVERHEAD DOOR STOPS

- A. General: Door stops to be of type and design as specified below or in the Hardware Sets.
- B. Overhead door stop: Stainless steel, US32D finish, maximum door opening 110 degrees.

1. Acceptable Manufacturers:
 - a. Rockwood Manufacturing (RO).
 - b. Hiawatha, Inc. (HI).

2.10 DOOR SILENCERS

- A. All new interior metal door frames shall be provided with door silencers, 3 per single door and 2 for pair of doors.

2.11 POWER SUPPLY

- A. Power supply for electronic access control and security components.

- B. Provide and install all electrical connections, wiring, junction boxes, etc. as required between building electrical and power supply unit to make fully operational. Provide all components necessary to connect to access control system readers.
- C. Basis of design is Boxed Power Supply by Securitron/Assa Abloy, model BPS-24-1

2.12 POWER TRANSFER DEVICES

- A. Cabling/harnesses to be as follows:
 - 1. Door Wiring Harness - Cable between hinge and through the door to the lockset:
ElectroLynx QC-C206
 - 2. Frame Wiring Harness - Cable from the hinge location, up the jamb to above ceiling:
ElectroLynx QC-C1500P
- B. Electric hinge to be McKinney ElectroLynx Hinge model TA2314 QC4 or equal.

2.13 ACCESSORIES

- A. Key Cabinet: Provide and install one key cabinet manufactured of 18 ga. cold rolled steel with a capacity for 50% more keys than required for the project. Furnish a two tag system with all cross indexing materials. Lund DeLuxe or equal.
 - 1. All project keys are to be tagged, numbered and hung in the key cabinet for delivery to Owner.

2.14 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.15 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- D. Hardware in General: US26D Dull Chrome

- E. Exit Devices, flat goods - US32D - Satin Stainless Steel
- F. Continuous hinges - clear anodized aluminum or dark bronze anodized (selected by Owner).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify Owner of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 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.

3.6 CLEANING AND PROTECTION

- A. Clean work under provisions of 01 70 00.
- B. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- C. Clean adjacent surfaces soiled by door hardware installation.
- D. Clean operating items as necessary to restore proper finish, and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SCHEDULE

- A. The hardware sets in the following schedule represent the design intent and direction of the owner. They are a guideline only and should not be considered a detailed hardware schedule. Not every type of hardware set that may be required is indicated on this schedule, nor is every necessary hardware component indicated.

A complete door and hardware schedule, including all door openings and hardware components, is to be submitted at the Preliminary Design phase for the Owner's review and approval.

3.07 COMPLETE HARDWARE INSTALLATION

- A. The following schedule listings cover typical openings. The Design/Builder shall be responsible for complete examination of the drawings and shall furnish all hardware required. Any hardware necessary but not specifically mentioned herein shall be of the like quality, weight, design and finish as similar openings or items specified herein.
- B. Provide silencers on all new metal frames. Three on single leaf door frames, two on pairs of doors and four on double egress.
- C. Provide wall stops at all interior doors.
- D. Provide tactile warning on all door locksets required by code.
- E. Doors 42" in width are to use continuous geared hinges as specified below even if the door hardware schedule below does not list it.
- F. Provide thermal pins (door to door) on all pairs of 45 minute or more rated fire doors per code.

3.08 HARDWARE SCHEDULE:

HW-1 Exterior Aluminum Doors

Cylinders - Type and quantity as required

HW-2 Exterior Single Doors with Electrified Exit Device

1 Continuous Geared Hinge
1 Power Transfer Device
1 Power Supply
1 Electrified Exit Device 12-NB8876 ETL (Fail-secure electrified trim)
1 Closer
1 Kickplate 8 inches high x 2 inches less than door width
1 Stop
3 Silencers
1 Card/Proximity Reader Reader unlocks lockset.

HW-3 Interior Pairs Fire Rated Egress Doors with Security

- 2 Continuous Geared Hinges
- 1 Electrified Exit Device 12-NB8774 ETL (Fail-secure electrified trim) (Active leaf)
- 1 Exit Device 12-NB8710 ETL (Inactive leaf)
- 1 Power supply
- 1 Power transfer device.
- 1 Card/Proximity Reader Reader unlocks electrified exit device.
- 2 Closers
- 2 Kickplates
- 2 Silencers
- 1 Fusible Alignment Pin

HW-4 Interior Single Doors with Electric Lockset

- Butts
- 1 Electrified hinge
- 1 Door and Frame wiring harness
- 1 Power Supply
- 1 Electric lockset 10G71 – 24VAC (Fail Secure)
- 1 Closer
- 1 Kickplate 8 inches high x 2 inches less than door width
- 1 Stop
- 3 Silencers
- 1 Card/Proximity Reader Reader unlocks lockset.

HW-5 Interior Single Doors with Electric Electrified Exit Device

- Butts
- 1 Electrified hinge
- 1 Door and Frame wiring harness
- 1 Power Supply
- 1 Electrified Exit Device 12-NB8876 ETL (Fail-secure electrified trim)
- 1 Closer
- 1 Kickplate 8 inches high x 2 inches less than door width
- 1 Stop
- 3 Silencers
- 1 Card/Proximity Reader Reader unlocks Electrified Exit Device.

HW-6 Interior Single Fire Rated Egress Doors with Lever & Key

- Butts
- 1 Exit Device 12-8813 ETL
- 1 Closer
- 1 Kickplate
- 1 Stop
- 3 Silencers

HW-7 Interior Single Fire Rated Egress Doors with Lever/Passage Function

Butts

1 Exit Device 12-8815 ETL

1 Closer

1 Stop

3 Silencers

HW-8 Interior Single Doors with Classroom Lock & Closer

Butts

1 Lockset 10G37

1 Closer

1 Kickplate

1 Stop

3 Silencers

HW-9 Interior Single Doors with Office Lock and Closer

Butts

1 Lockset 10G05

1 Closer

1 Kickplate

1 Stop

3 Silencers

HW-10 Interior Single Doors with Storeroom Lock and Closer

Butts

1 Lockset 10G04

1 Closer

1 Stop

3 Silencers

HW-11 Interior Single Doors with Passage Set and Closer

Butts

1 Passage Set 10U15

1 Closer

1 Kickplate

1 Stop

3 Silencers

HW-12 Interior Single Doors with Office Lock

Butts
1 Lockset 10G05
1 Kickplate
1 Stop
3 Silencers

HW-13 Interior Single Doors with Storeroom Lock

Butts
1 Lockset 10G24
1 Stop
3 Silencers

HW-14 Interior Single Doors with Passage Set

Butts
1 Passage Set 10U15
1 Stop
3 Silencers

HW-15 Interior Single Doors with Storeroom Lock for Elevator Machine room

Butts
1 Lockset 10G04 with tactile warning
1 Closer
1 Stop
3 Silencers

HW-16 Single Private Toilet Room Doors with Closer

Butts
1 Privacy Set 49-8265 (mortise lockset) with LN rose (Occupancy Indicator)
1 Closer
1 Stop
3 Silencers

HW-17 Interior Single Non Rated Doors with Push/Pull

Butts
1 Push Plate
1 Door Pull
1 Closer
1 Kickplate
1 Stop
3 Silencers

HW-18 Not Used

HW-19 Interior Bi-Pass Doors

1 Track and Hardware BP250N, (Stanley) supports panels weighing up to 250 pounds (includes aluminum track, aluminum fascia, track spacer, four ball bearing wheel hangers, floor guide, BP250-61 pulls [1 pull per panel] and fasteners) Size as required for width of opening.

HW-20 Interior Pairs Fire Rated Egress Doors with Lever/Passage Function

Butts
2 Exit Devices 12-NB8715 ETP
2 Closers
2 Kickplates
2 Stops
2 Silencers
1 Fusible Alignment Pin

HW-21 Interior Single Doors with Classroom Lock

Butts
1 Lockset 10G37
1 Kickplate
1 Stop
3 Silencers

END OF SECTION

SECTION 08 71 50

WEATHERSTRIPPING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The furnishing and installation of all door weatherstripping.

1.02 RELATED SECTIONS

- A. 08 12 13 - Steel Door Frames
- B. 08 13 13 - Steel doors

1.03 DESIGN REQUIREMENTS

- A. All work not shown or specified but required to complete the installation shall be provided.
- B. Provide and install weatherstripping on all new exterior doors.

1.04 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Shop drawings: Indicate various styles with model numbers and manufacturer.
- C. Provide samples if asked for by Owner.

1.05 QUALIFICATIONS

- A. Installer: Products specified under this section shall be installed by competent tradesmen experienced in this work.

1.06 REGULATORY REQUIREMENTS

- A. Work shall satisfy requirements of government agencies having jurisdiction.
- B. All thresholds to comply with the state building code and ANSI A117.1.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.

1.08 FIELD MEASUREMENTS

- A. Field verify all dimensions prior to installation.

1.09 WARRANTY

- A. Provide one year warranty under provisions of Section 01 78 00.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Pemko
- B. Other acceptable manufacturers offering equivalent products.
 - 1. Accurate Metal Weatherstrip Co., Inc.
 - 2. Zero International, Inc.
- C. Substitutions: Under provisions of Section 01600.

2.02 MATERIALS

- A. Exterior outswinging metal doors with metal jamb.
 - 1. Head and jambs: 316DPK
 - 2. Sweep: 315DN
 - 3. Threshold: 252X3AFG (thermal break)

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Weatherstripping shall be applied in accordance with manufacturers specifications. Thresholds shall be set in elastic cement and held in place with rawl plugs and aluminum screws.

3.02 DISSIMILAR MATERIALS

- A. Where aluminum surfaces come in contact with metals other than stainless steel, zinc, white bronze or other metals compatible with aluminum, aluminum surfaces shall be kept from direct contact with such parts by (a) painting the dissimilar metal with a coating of heavy bodied bituminous paint, (b) a good quality caulking placed between aluminum and dissimilar metal, or (c) a non-absorptive tape or gasket.

3.03 ADJUSTMENTS

- A. Adjust weatherstripping as required to provide proper weatherproofing.
- B. Gaskets and/or caulking shall be provided as required for a proper installation.

3.04 CLEANING

- A. Clean work under provisions of Section 01 70 00.

END OF SECTION

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SECTION 08 81 00

GLASS AND GLAZING

PART 1 - GENERAL

1.01 SCOPE: Provide all glass and glazing work complete in accordance with the Specifications and Drawings.

1.02 RELATED SECTIONS

- A. Section – 08 12 13 - Wood Doors
- B. Section – 08 13 13 - Steel Doors
- C. Section - 08 12 13 – Steel Door Frames
- D. Section – 08 42 13 – Aluminum Entrance Doors

1.03 REFERENCES

- A. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Material Used in Buildings.
- B. ASTM E84 - Surface Burning Characteristics of Building Materials.
- C. FS DD-G-451 - Glass, Float or Plate, Sheet, Figured (Flat, for Glazing, Mirrors and Other Uses).
- D. FS DD-G-1403 - Glass, Plate (Float), Sheet, Figured, and Spandrel (Heat Strengthened and Fully Tempered).
- E. SIGMA No. 64-7-2 - Specification for Sealed Insulating Glass Units.
- F. FGMA - Glazing Manual.

1.04 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.
- B. Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- C. Provide data on glazing sealant. Identify colors available.
- D. Submit samples under provisions of Section 01 33 00.
- E. Submit samples of each type glass and each type glazing material.

- F. Submit sealed glass unit manufacturer's certificate under provisions of Section 01 33 00 indicating units meet or exceed specified requirements.

1.06 DELIVERY, STORAGE, AND PROTECTION

- A. Deliver products to site under provisions of Section 01 60 00.
- B. Store and protect products under provisions of Section 01 60 00.

1.07 WARRANTY

- A. Provide ten year warranty under provisions of Section 01 78 00.
- B. Warranty: Include coverage of sealed glass units from seal failure, interpane dusting or misting, and replacement of same.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Vitro Architectural Glass
- B. Substitutions under provisions of Section 01 60 00.

2.02 GLASS MATERIALS

- A. Safety Glass:
FS DD-G-1403; Kind ft., 1/4" Type 1, tempered. Listed in door schedule as "Temp".
- B. Exterior insulated glass
 - 1. 1" insulated - 1" thick (1/4" glass, 1/2" airspace, 1/4" glass), hermetically sealed, low "E".
Exterior pane of glass tinted. Tint color and shade to be selected by Owner from manufacturer's standard colors.
Glass to be tempered as required. CBA rated and certified.
 - a. Glass is to meet the following National Fenestration Rating Council (NFRC) testing in accordance with the RI State Building Code SBC-8 State Energy Conservation Code
 - 1. NFRC 100; Procedure for Determining Fenestration Thermal Properties:
The conductive thermal transmittance (U-Factor) shall not be more than:
 - a. 0.38 BTU/hr/sf/°F at fixed storefront window systems.
 - b. 0.45 BTU/hr/sf/°F at operable window systems.
 - c. 0.77 BTU/hr/sf/°F at exterior doors.
 - 2. NFRC 200; Solar Heat Gain Coefficient and Visible Transmittance:
Solar Heat Gain Coefficient (SHGC): shall not be more than 0.40 at all fenestrations.

2.03 ACCESSORIES

A. Glazing Compound, Tape and Sealant:

1. Compound - Tremco Glazing Compound or approved equal.
2. Tape - Tremco Polyisobutylene #440 or approved equal.
3. Sealant - Tremco Mono Sealant or approved equal.

B.. Setting Blocks and Spacers shall be provided of resilient types and materials as recommended by the manufacturer of the glass or glazing materials.

2.04 MANUFACTURER'S LABELS:

Manufacturer's labels showing strength, grade, thickness, type and quality will be required on each piece of glass. Labels must remain on glass until it has been set and inspected. Glazing materials shall be delivered to the site in unopened original containers bearing manufacturer's label specifying the quality, brand, trade name and directions for use. Thinners or additives shall not be used for glazing materials unless specifically recommended by the manufacturer.

PART 3 - EXECUTION

3.01 INSTALLATION:

- A. General:** Surfaces of rabbets, glass edges and stops or beads shall be clean, dry, free from dust, oil, rust and loose paint. Metal surfaces shall be wiped clean with solvent recommended by the manufacturer. Glazing materials shall not be applied in temperature below 40 degrees F. or during damp or rainy weather. Glass shall be set without springing or forcing. Glazing compound shall be applied in accordance with the recommendations of the manufacturer. Centered position and compound thickness shall be maintained. Setting blocks at the sills and centering shims inside and out on all four sides of glass shall be provided.
- B. Wood Doors:** Glass shall be held in place with wood glazing stops. Glazing shall be done after doors have been installed and surfaces primed and are thoroughly dry. Glass shall be of proper size to obtain the required edge clearances. Glass shall rest on setting blocks and the entire perimeter of the glass shall be bedded in glazing compound. Edge and face clearances shall be maintained uniform. Glazing compound shall fill rabbet solidly with the stop bead in place. Stop bead shall be fastened with screws. Surplus glazing compound shall be removed from both sides of glass at an angle.
- C. Metal Windows and Glazing in Metal Frames:** Glazing shall be of the snap-in type and shall have no exposed fasteners except that glazing in metal frames shall be of the applied type. Glazing shall not be done until windows have been set and adjusted. Glass shall be of proper size, rest on setting blocks and the entire perimeter of the glass shall be bedded in glazing compound. Edge and face clearances shall be maintained uniform and spacers shall be provided. Glazing compound shall fill rabbet solidly with the snap-in bead in place. After bead is in place surplus glazing compound shall be removed from both sides of glass at an angle, so as not to undercut.
- D. All glass shall be installed in accordance to the recommendations of the Flat Glass Jobber's Association Glazing Manual and the glass manufacturer.**

3.02 CLEANING: Glass shall be cleaned on both sides of surplus glazing material. Glazing materials shall not be disturbed with scrapers. Acid solutions or water containing caustic soaps shall not be used. Broken and cracked glass and glass not complying with the specifications shall be replaced.

3.03 GLASS SCHEDULE:

<u>LOCATION</u>	<u>GLASS</u>
Interior Window (vision panel) Non Rated	Safety Glass
Interior Doors Non Rated	Safety Glass
Exterior Entrance Doors	1" Insulated and Tempered
Exterior Storefront Windows	1" Insulated (Also tempered where required by code.)

END OF SECTION

SECTION 08 88 13

FIRE-RATED GLASS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Fire-rated glazing materials installed as transoms, door lites, borrowed lites or windows in fire-rated frames
- B. Related Sections:
 - 1. Section 08 12 13 – Steel Door Frames
 - 2. Section 08 13 13 – Steel Doors
 - 3. Section 08 14 16 – Wood Doors

1.02 REFERENCES

- A. ASTM E 119 - Fire Tests of Building Construction Materials.
- B. ASTM E 2010 - Standard Test Method for Positive Pressure Fire Tests of Window Assemblies.
- C. ASTM E 2074 - Standard Test Method for Fire Tests of Door Assemblies, Including Positive Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies.
- D. CSFM - Fire Tests for Doors and Window Assemblies.
- E. GANA - Glazing Manual.
- F. GANA - Sealant Manual.
- G. NFPA 80 - Fire Doors and Windows.
- H. NFPA 251 - Fire Test for Fire Endurance of Building Construction and Materials.
- I. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
- J. NFPA 257 - Standard on Fire Test for Window and Glass Block Assemblies.
- K. UBC Standard 7-1 - Fire Test of Building Construction and Materials.
- L. UBC Standard 7-2 - Fire Tests of Door Assemblies (Positive Pressure).
- M. UBC Standard 7-4 - Fire Tests of Window Assemblies.
- N. UL 9 - Fire Tests of Window Assemblies.
- O. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
- P. UL 10B - Fire Tests of Door Assemblies.
- Q. UL 263 - Fire Resistance Ratings.

1.03 SUBMITTALS

- A. Comply with requirements of Section 01 33 00
- B. Product Data: Submit manufacturer's technical data for each glazing material required, including installation and maintenance instructions.
- C. Certificates of compliance and glazing materials from glass and glazing materials manufacturers attesting that glass and glazing materials furnished for project comply with requirements. Separate certification will not be required for glazing materials bearing manufacturer's permanent label designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authority having jurisdiction.
- D. Product test Listings: from a qualified testing agency indicating fire-rated glass complies with requirements, based on comprehensive testing of current product.
- E. Samples: Submit, for verification and approval purposes, approx. 8" x 10" sample for each type of glass indicated.

1.04 QUALITY ASSURANCE

- A. Glazing Standards: GANA Glazing Manual and Sealant Manual
- B. Each lite shall bear a permanent, non-removable label of Underwriters Laboratories and/or Intertek Testing Services (Warnock-Hersey) certifying it for use in tested and rated fire protective assemblies.

1.05 DELIVERY, STORAGE, and HANDLING

- A. Deliver, store and handle materials under provisions of Section 01 60 00
- B. Deliver materials to specified destination in manufacturer's or distributor's packaging, undamaged, complete with installation instructions.
- C. Store off ground, under cover, protected from weather and construction activities.

1.06 WARRANTY

- A. Provide manufacturer's three year limited warranty under provision of Section 01 78 00

PART 2 -PRODUCTS

2.01 FIRE RATED GLAZING MATERIALS

- A. Manufacturer: Vetrotech Saint-Gobain NA, Auburn, WA
- B. Other acceptable manufacturers offering equivalent products.
 - 1. Technical Glass Products

2. Safti First

C. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS

A. Fire/safety rated glass with safety film properties (Keralite F):

Listed in door schedule as "FR/SFTY".

1. Thickness: 3/16"
2. Weight: 2.7 lbs / sq. ft.
3. Approx. visible light transmission: 86%
4. Impact Safety Rating: ANSI Z97.1 and CPSC 16CFR1201 (CAT I & II)
5. Film: 3M Scotchshield Ultra Safety and Security Film.
6. Fire-Rating Testing: Fire rating tested and listed by Intertek Testing Services (Warnock-Hersey) or Underwriters Laboratories; tested in accordance with UBC Standard 7-2, UBC Standard 7-4, UL 9, UL 10c, NFPA 252, NFPA 257, ASTM E 2010, and ASTM 2074.
7. Maximum allowable sizes are as follows:

Thickness	Assembly	Max. Exposed Area (sq. in.)	Max. Width Exposed	Max. Height Exposed	Stop Height
3/16"					
	Doors Non Temp Rise (20 & 45-minutes)	3,627 sq. in.	46 1/2"	78"	5/8"
	Borrowed Lites (20 & 45 minutes)	3,627 sq. in.	46 1/2"	78"	5/8"
	Doors Non Temp Rise (60 minutes)	3,627 sq. in.	46 1/2"	78"	5/8"
	Doors Temp Rise (60 Minutes)	100 sq. in.	10"	33"	5/8"
	Borrowed Lites (60 minutes)	3,627 sq. in.	46 1/2"	78"	5/8"
	Doors Non Temp Rise (90 minutes)	3,534 sq. in.	46 1/2"	76"	5/8"
	Doors Temp Rise (90 Minutes)	100 sq. in.	10"	33"	5/8"
	Borrowed Lites (90 minutes)	2,736 sq. in.	60 1/4"	76"	5/8"

- B. Labeling: Permanently label each lite with laboratory logo (WHI and/or UL), product and manufacturer's name and fire rating.
- C. Fire Rating: Fire-rating listed and tested by Intertek Testing (WHI) for fire scheduled at opening locations on drawings, when tested in accordance with (ASTM E-152) (ASTM E-163) (UBC Standards 7-2 and 7-4) (NFPA 252 & 252) (UL 9 & UL10C)

2.02 GLAZING COMPOUND

- A. Glazing Tape: Closed cell polyvinyl chloride (PVC) foam tape, with adhesive on two sides.
- B. Silicone Sealant: one-part neutral curing silicone
 - 1. Dow Corning 795 – Dow Corning Corp.
 - 2. Siliglaze-II 2800 – General Electric CO.
 - 3. Spectrum 2 – Tremco Inc.
- C. Setting Blocks: Neoprene, EPDM, calcium silicate, or hardwood; as tested for compatibility with glazing compound.
- D. Cleaner, Primer, and Sealant: Type recommended by manufacturer of glass and gaskets.

2.03 FABRICATION

- A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine glass and framing, with glazier present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including this for size, squareness, offsets at corners.
 - 2. Minimum required face or edge clearances
 - 3. Observable edge damage or face imperfections.
- B. Do not proceed with glazing until unsatisfactory conditions have been corrected.
- C. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

3.02 INSTALLATION (GLAZING)

- A. Comply with referenced GANA glazing manual and instructions of manufacturers of glass, glazing sealants, and glazing compounds.
- B. Protect glass from edge damage during installation and handling.

- C. Inspect glass during installation and set aside pieces with edge damage that could affect performance.
- D. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
- E. Cut glazing tape to length and set against permanent stops, flush with sight lines to fit openings exactly, with stretch allowance during installation.
- F. Place setting blocks located at quarter points of glass with edge block no more than 8 inches from corner.
- G. Do not restrict movement due to thermal expansion.
- H. Direct glass-to-perimeter frame contact is prohibited.
- I. Glaze vertically into labeled doors or frames or partition walls with same fire rating as glass and push against tape for full contact at perimeter of pane or unit.
- J. Place glazing tape on free perimeter of glazing with same fire rating as glass and push against tape for full contact at perimeter of pane or unit.
- K. Do not remove protective edge tape.
- L. Install removable stop and secure without displacing tape or glazing compound.
- M. Knife trim protruding tape.
- N. Apply cap bead of silicone sealant along void between glass stop and glazing, to uniform line, with bevel to form watershed away from glass. Tool or wipe surface smooth.
- O. Do not pressure glaze.
- P. Install in vision panels in doors to requirements of NFPA 80. Install so that required markings remain visible.

3.03 PROTECTION AND CLEANING

- A. Protect glass from contact with contaminating substances resulting from construction operations. Remove any such substances by methods approved by manufacturer.
- B. Wash glass on both faces not more than four days prior to date scheduled for inspections intended to establish date of substantial completion. Wash glass by method recommended by glass manufacturer.

END OF SECTION

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SECTION 09 01 60

WOOD FLOOR REFINISHING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish all labor, materials and equipment required to complete the work described in this section.
- B. Clean, sand and refinish existing wood floors.
- C. Secure loose flooring.
- D. Patch and repair existing flooring
- E. Removal of existing floor coverings only where wood floors are to be refinished.

1.02 REFERENCES

- A. National Oak Flooring Manufacturer's Association (NOFMA)

1.03 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.

1.04 QUALIFICATIONS

- A. The Design/Builder shall specialize in performing the work of this section with three years minimum experience.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600. Store in dry area with adequate air circulation.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 70 degrees F. for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.
- B. Minimum application temperature for finish shall be 50 degrees F. unless required otherwise by the manufacturer's instructions.
- C. Do not proceed with refinishing of wood floors until spaces have been enclosed, other work which might damage or soil the floors is complete and the spaces are at approximate humidity condition planned for occupancy.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Stain shall be a penetrating non-fading wood stain of color required to match existing flooring and to be approved by the Owner.
- B. Wood filler shall be paste type, pigmented to match existing flooring and to be approved by the Owner.
- C. Polyurethane clear gloss finish: Rez 77-5 by Pittsburgh Paints ore equal.
- D. Substitutions: Under provisions of Section 01 60 00.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Design/Builder must examine all wood flooring to be refinished and conditions under which work will be performed and must notify the Owner in writing of conditions detrimental to the proper completion and maintenance of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

- A. Remove existing floor coverings in areas where wood floors are to be refinished.
- B. Renail existing loose flooring with screw type flooring nails that are surface nailed, set and filled.
- C. Replace all damaged wood flooring in areas to be refinished, as required to match existing. New wood flooring strips shall match the quality, color, pattern and texture of the existing flooring. Assume for bidding purposes 100 square feet of wood flooring will be replaced.

3.03 SANDING

- A. All refinish work is to be done after all other trades are finished. The wood floors shall be sanded with a heavy power driven sander. For the first cut, the floor shall be traversed in both directions going with the grain of the flooring using No. 2-1/2 sandpaper. Follow with No. 1-1/2 paper, then with No. 1/2, finishing with No. 00. All cuts should be made with the grain. Rough or finish sanding on the diagonal will not be permitted without specific permission from the Owner. Particular attention should be give on each finishing cut to completely remove the coarser grit marks from the preceding cut. Sanding machine shall not be moved more than two boards at a time for each traverse on any of the four cuts. After sanding, Design/Builder shall thoroughly vacuum floor with heavy duty commercial type vacuum. Floor shall be thoroughly swept with a tack rag until no traces of powder remain. Request inspection by the Owner or his authorized representative before any finishing work starts.

- B. Do not permit traffic on floor after sanding and until finish is completed.
- C. Cover sanded floor to provide access for application of first finish coats.

3.04 FINISHING

- A. Apply stain on flooring to match existing.
- B. Apply three coats of clear polyurethane finish in accordance with manufacturer's instructions.
- C. During finishing and drying time, floor must be free of dust and dirt. Avoid air currents that carry dust and dirt. Allow adequate ventilation for proper curing.

3.05 CLEANING

- A. Clean work under provisions of Section 01 70 00.
- B. Dispose of all unused materials and containers properly and in accordance with appropriate codes.

3.06 PROTECTION OF FINISHED WORK

- A. Protect finished work under provisions of Section 01 70 00.
- B. Protect finished floor with heavy covering during construction.
- C. After the final coat, do not use floor for at least 72 hours. Avoid heavy traffic for at least a week.

END OF SECTION

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SECTION 09 21 16

STEEL FRAMED DRYWALL SYSTEMS

PART 1 - GENERAL

- 1.01 SCOPE: Provide all necessary materials for construction of drywall systems.
- 1.02 RELATED SECTIONS:
- A. Division 06 Carpentry Section for wood framing, blocking and furring.
 - B. Division 09 Painting Section for paint applied to gypsum board surfaces.
- 1.03 DELIVERY AND STORAGE OF MATERIALS:
- A. Deliver, store, and handle under provision of Section 01 60 00.
 - B. All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises. Stack gypsum panels flat to prevent sagging.
- 1.04 ENVIRONMENTAL CONDITIONS:
- A. In cold weather and during gypsum panel joint finishing, temperatures within the building shall be maintained within the range of 55 degrees to 70 degrees F. Adequate ventilation shall be provided to carry off excess moisture.
 - B. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
- 1.05 SUBMITTALS
- A. Submit under provisions of Section 01 33 00.
 - B. Product Data: Submit product data on all materials and accessories.

PART 2 - PRODUCTS

- 2.01 MANUFACTURERS
- A. Provide manufacturer and product specified under the Materials paragraph below.
 - B. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS: See drawings for size and location of materials.

- A. Non-Structural Studs: Cold-formed galvanized steel C-studs as per ASTM C 645, ProSTUD products manufactured by ClarkDietrich Building Systems.
 - 1. See drawings for gage, minimum 25 gage for interior non-load bearing, maximum 10'-0" high and 20 gage for above 10'. Provide 20 gage for jamb and lintel components.
 - 2. Flange Size: 1 1/4 inch.
 - 3. Web Depth: As specified on Drawings.
- B. Non-Structural Track: Cold-formed galvanized steel runner tracks, drywall track, in conformance with ASTM C 645, ProTRAK as manufactured by ClarkDietrich Building Systems.
 - 1. Flange Size: 1-1/4 inch
 - 2. Web Depth: Track web to match and coordinate with stud web size.
- C. Metal Furring (Hat) Channel manufactured by ClarkDietrich Building Systems: 7/8" depth by 10' or 12' length, (20 gage at ceilings) (25 gage at walls), meet or exceed ASTM C645.
- D. Z Furring Channel manufactured by ClarkDietrich Building Systems available in 1", 1-1/2", 2", 2 1/2" depths by 10' length with 1 1/4" wide flange, meet or exceed ASTM C645.
See drawings for size and gage.
- E. RC-1 Pro Resilient Channel Single leg resilient channel manufactured by ClarkDietrich Building Systems. 25 gage steel, 1 1/4" screw flange, 1/2" deep, meet or exceed ASTM C645.
- F. Provide 1-1/2" Cold-Rolled Channels.
- G. Galvanized Hanger Wire (12-ga)
- H. 18-ga. Galvanized Tie Wire.
- I. Faceboards - 48" wide USG Sheetrock Brand
Firecode Type X gypsum board
Provide lengths as required.
- J. Fasteners - USG Screws: 3/8" Type S, pan head; 3/8", 1/2" Type S-12, pan head; 5/8" Type S-12 low-profile head; 1", 1-1/4", 1-5/8", 1-7/8", 2-1/4" Type S, bugle head; 1", 1-5/8", 2-1/4" Type S or S-12, trim head; 1-1/2" Type G, bugle head; 1-1/4" Type W, bugle head; 1'-1/4" annular ring drywall nail.
- K. USG Trim No. (200-A)(401)(402)(P-1)(801-A)(801-B).
- L. USG Corner Bead - (No. 103 DUR-A-BEAD) (No. 104 DUR-A-BEAD)(No.800) Metal Corner Reinforcement.
- M. USG Control Joint No. 093
- N. Joint Treatment (select a United States Gypsum Company Joint System)

Standard Gypsum = Joint Treatment: Sheetrock Brand All Purpose Joint Compound.
Provide a Level 4 gypsum board finish.

- O. USG Acoustical Sealant

PART 3 - EXECUTION

3.01 PARTITION INSTALLATION

- A. **STUD SYSTEM ERECTION:** Attach steel runners at floor and ceiling to structural elements with suitable fasteners located 2" from each end and spaced 24" o.c.
To suspended ceilings, use toggle bolts or hollow wall anchors spaced 16" o.c.

Position studs vertically, with open side facing in same direction, engaging floor and ceiling runners, and spaced 16" o.c. When necessary, splice studs with 8" nested lap and two positive attachments per stud flange. Place studs in direct contact with all door frame jambs, abutting partitions, partition corners and existing construction elements. Where studs are installed directly against exterior walls and a possibility of water penetration through walls exists, install asphalt felt strips between studs and wall surfaces.

Anchor all studs for shelf-walls and those adjacent to door and window frames, partition intersections, corners and freestanding furring to ceiling and floor runner flanges with USG Metal Lock Fastener tool or screws. Securely anchor studs to jamb and head anchors of door or borrowed light frames by bolt or screw attachment. Over metal door and borrowed light frames, place horizontally a cut to length section of runner, with a web flange bend at each end, and secure to strut-studs with two screws in each bent web. Position a cut-to-length stud (extending to ceiling runner) at vertical panel joints over door frame header. When attaching studs to steel grid system, structural adequacy of grid to support end reaction of wall must be determined.

- B. As occurring:
Position resilient channel at right angles to steel studs, space 16" o.c. and attach to stud flanges with 3/8" Type S pan head screws driven through holes in channel mounting flange. Install channels with mounting flange down. (Channel may be inverted at floor to accommodate attachment of base). Locate channels 2" from floor and within 6" of ceiling. Extend channels into all corners and attach to corner framing. Cantilever channel ends no more than 6". Splice channel by nesting directly over stud screw attach through both flanges. Reinforce with screws located at both ends of splice.
- C. As occurring:
Install Sound Attenuation Insulation after gypsum panels are applied to the resilient channel (if occurring) and before panels are applied to other side of studs. Insert the sound insulation in the stud cavity, by bowing the blanket slightly. After inserting, make a vertical cut between the studs. Slit the blanket with a sharp utility or hook-bill knife to ease the pressure of the blanket against the gypsum panels when they are installed. Butt ends of blankets closely together and fill all voids. Seal perimeter of gypboard and all penetrations with acoustical sealant to complete the requirements for a sound retardant partition.

3.02 APPLYING INTERIOR GYPSUM BOARD

- A. Single-Layer Application:
 - A. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
 - B. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
 - C. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - D. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- B. Multilayer Application:
 - 1. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
 - 2. On ceilings, apply gypsum board indicated for base layers before applying face layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints 1 framing member, 16 inches minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

C. Gypsum Panel Attachment

Screw spacing that follows is for non-rated construction. For fire-rated construction, obtain screw spacing from manufacturer's fire test report.

For single-layer panel application, space screws 16" o.c. in field and along abutting end joints.

For double-layer screw attachment, space screws 24" o.c. in base layer and 16" o.c. in face layer. Apply both layers of gypsum panels vertically with joints in face layer offset from base layer joints by at least one stud. On tall walls, offset end joints also. For 1/2" and 5/8" panels, use 1" screws for base layer and 1-5/8" screws for face layer.

For resilient construction, apply gypsum panels with long dimension perpendicular to resilient channels and fasten with 1" Type S Screws spaced 12" o.c. along channels. Where channel resiliency makes screw placement difficult, the next longer screw may be used but do not drive screw directly over stud.

3.03 DRYWALL SOFFIT ERECTION:

Attach steel runners 24" o.c. to concrete slabs and concrete stub nails or power-driven anchors, to suspended ceilings with toggle bolts or to wood framing with suitable fasteners. On stud walls, space fasteners to engage each stud. On ceilings, place fastener close to outside face runner.

Fasten vertical face panel to web of face corner runner and flange of ceiling runner with 1" Type S Screws spaced 12" o.c. For braced furring, insert steel studs between face corner runners, sidewall and ceiling runners and attach studs to runners with Metal Lock Fastener tool or 3/8" pan head screws. Attach face panels to steel studs and runners with 1" Type S Screws spaced 12" o.c. Space screws in corner runner at least 1" from gypsum panel edge.

3.04 CEILING INSTALLATION

- A. **GRILLAGE ERECTION:** Space 9 ga. hanger wires 48" o.c. along carrying channels and within 6" of ends of carrying channel run. In concrete, anchor hangers by attachment to reinforcing steel, by loops embedded at least 2" or by approved inserts. For steel construction, wrap hanger around or through beams or joists.

Install 1-1/2" carrying channels 48" o.c. and within 6" of walls. Position channels for proper ceiling height, level, and secure with hanger wire saddle-tied along channel. Provide 1" clearance between runners and abutting walls and partitions. At channel splices, interlock flanges, overlap ends 12" and secure each end with double strand 18 ga. tie wire.

Erect metal furring channels at right angles to 1-1/2" carrying channels or main supports. Space furring 16" o.c. and within 6" of walls. Provide 1" clearance between furring ends and abutting walls and partitions. Secure furring to carrying channels with clips or wire tie to supports with double strand 18 ga. wire. At splices, nest furring channels at least 8" and securely wire-tie each with double strand 18 ga. wire.

At light troffers or any openings that interrupt the carrying or furring channels, install additional cross reinforcing to restore lateral stability of grillage.

- B. **STEEL STUD FRAMING SYSTEM ERECTION:** Attach runners at ceiling height, through gypsum panels, to each partition stud with two screws. Insert steel studs in runners and attach each end with one 3/8" pan head screw. Install 1-5/8" stud cross bracing over stud framing, space 48" o.c. and attach to each framing stud with two 3/8" pan head screws. At hangers, install 12" long stud section for box reinforcing or lap studs 12" and secure each end with two 3/8" pan head screws.

At light troffers or any openings that interrupt the ceiling, install additional cross reinforcing to maintain structural integrity of framing.

- C. **GYPSUM PANEL ERECTION:** Apply gypsum panels of maximum practical length with long dimension perpendicular to furring channels. Position end joints over channel web and stagger in adjacent rows. Fit ends and edges closely, but not forced together. Fasten panels to channels with 1" Type S Screws spaced 12" o.c. in field of panels and along abutting ends and edges.

3.05 WALL FURRING INSTALLATION

- A. **METAL FURRING (HAT) CHANNEL INSTALLATION:** Attach metal furring channels horizontally, spaced 24" o.c. to interior of masonry or concrete surface with hammer set or power driven fasteners or concrete stub nails staggered 24" o.c. on opposite flanges. Where furring channel is installed directly to exterior wall and a possibility of water penetration through walls exists, install asphalt felt protection strip between furring channel and wall.

Apply gypsum panels parallel to channel. Position all edges over furring channels in parallel application; all ends over framing in perpendicular application with joints staggered in successive courses. Use maximum practical lengths to minimize end joints. Fit ends and edges closely, but not forced together. Fasten panels to channels with 1" Type S Screws spaced 16" o.c.

- B. **Z FURRING CHANNEL INSTALLATION:** Erect insulation vertically and hold in place with Z-furring channels spaced 24" o.c. Except at exterior corners, attach narrow flanges of furring channels to wall with concrete stub nails or power driven fasteners spaced 24" o.c. At exterior corners, attach wide flange of furring channel to wall with short flange extending beyond corner. On adjacent wall surface, screw attach short flange of furring channel to web of attached channel. Start from this furring channel with a standard width insulation panel and continue to regular manner. At interior corners, space second channel no more than 12" from corner and cut insulation to fit. Hold mineral fiber insulation in place until gypsum panels are installed with 10" long staple field fabricated from 18 ga. tie wire and inserted through slot in channel. Apply wood blocking around window and door opening and as required for attachment of fixtures and furnishings.

Apply gypsum panels parallel to channels with vertical joints occurring over channels. Use no end joints in single-layer application. Attach gypsum panels with 1" Type S Screws spaced 16" oc. in field of panels and at edges, and with 1-1/4" Type S Screws spaced 12" o.c. at exterior corners. For double-layer application, apply base layer parallel to channels, face layer either perpendicular or parallel to channels with vertical joints offset at least one channel. Attach base layer with screws 24" o.c. and face layer with 1-5/8" screws 16" o.c.

3.08 CHASE WALL ERECTION

Align two parallel rows of floor and ceiling runners spaced apart as detailed. Attach to concrete slabs with concrete stub nails or power-driven anchors 24" o.c. to suspended ceilings with toggle bolts 16" o.c. or to wood framing with suitable fasteners 24" o.c.

Position steel studs vertically in runners, 24" o.c. with flanges in the same direction, and with studs on opposite sides of chase directly across from each other. Anchor all studs to floor and ceiling runner flanges with a Metal Lock Fastener tool or screws.

Cut cross bracing made from gypsum panels, 12" high by chase wall width. Place between rows of studs. Space braces 48" o.c. vertically and attach to stud webs with six 1" Type S Screws per brace. If larger braces are used, space screws 8" o.c. max. on each side.

Bracing of 2-1/2" steel studs may be used in place of gypsum panels. Anchor web at each end of at each end of steel brace to stud web with two 3/8" pan head screws. When chase wall studs are not opposite,

install steel stud cross braces 24" o.c. horizontally and securely anchor each end to a continuous horizontal 2-1/2" runner screw attached to chase wall studs within the cavity.

3.09 ACCESSORY APPLICATION

- A. **JOINT SYSTEM:** Finish all face panel joints and internal angles with a United States Gypsum Company Joint System installed according to manufacturer's directions. Spot exposed fastened on face layers and finish corner bead, control joints and trim as required, with at least three coats of joint compound, feathered out onto panel faces and sanded smooth.
- B. **CORNER BEAD:** Reinforce all vertical and horizontal exterior corners with corner bead fastened with 9/16" galvanized staples 9" o.c on both flanges along entire length of bead.
- C. **METAL TRIM:** Where assembly terminates against masonry or other dissimilar material, apply metal trim over panel edge and fasten with 9/16" galvanized staples 9" o.c.
- D. **SCREWS:** Power drive at least 3/8" from edges or ends of panel to provide uniform dimple 1/32" deep.
- E. **CONTROL JOINTS:** Break panel behind joint and back by double framing members (and 2" wide gypsum panel strip). Apply acoustical sealant to fill gap and attach control joint to face layer with 9/16" galvanized staples spaced 6" o.c. on both flanges along entire length of joint. Provide a full height control joint where a wall or partition extends in a continuous straight plane for more than 30 linear feet or where indicated on the drawings.

3.10 CLEANING

- A. Clean project under provisions of Section 01 70 00.

END OF SECTION

SECTION 09 28 13

CEMENTITIOUS BACKER BOARD

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. All necessary materials and labor to install cementitious backer board.

1.02 SUBMITTALS

- A. Submit product data under provisions of Section 01 33 00.

1.03 QUALIFICATIONS

- A. Installer: Company specializing in performing the work of this section with minimum three years experience.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Store products in an enclosed shelter providing protection from damage and exposure to the elements.

1.05 ENVIRONMENTAL REQUIREMENTS

- A. In cold weather and during backer board and tile installation, temperatures within the building shall be maintained within the range of 45° to 100°. Adequate ventilation shall be provided. Do not install board when it is wet.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. United States Gypsum Board
- B. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS

- A. Cement Board
 - 1. Durock Interior Cement Board, 5/8" thickness, 48" width x 96" length.
 - 2. Durock Cement Board Flooring Underlayment, 1/4" thickness, 36" width x 60" length.
- B. Joint Reinforcement - Durock Interior Tape.

- C. Fasteners
 - 1. Durock Steel Screws, 1-1/4" and 1-5/8" for 14 to 20 ga. steel framing; Durock Wood Screws, 1-1/4", 1-5/8" and 2-1/4" for wood framing.
 - 2. Nails 1-1/2" hot-dipped galvanized roofing nails.
- D. Adhesives/mortars
 - 1. Meeting ASTM C557-73: Multi-Purpose Adhesive (for subfloor attachment).
 - 2. Meeting ANSI A136.1 TypeI: Durabond D-67 Multi-Purpose Ceramic Tile Mastic or Durock or Durabond Multi-Purpose Ceramic Tile Mastic.
 - 3. Meeting ANSI A118.4: Durabond D-40 or Durock Latex Fortified Mortar, Durabond D-30 Thin-Cut Marble and Granite Mortar.
 - 4. Meeting ANSI A118.1: Durabond D-50 Thin-Set Mortar. Can be mixed with Durabond D-L16 Acrylic Latex Additive.
- E. Meeting ANSI A118.6: Durock LFG 250 Latex Fortified Grout; Durabond C-150 Commercial Dri-Set Grout mixed with Durabond D-L26 Acrylic Latex Grout Additive.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Framing to receive Durock Board shall be structurally sound, free from bow, and in general compliance with local building code requirements. Damaged and excessively bowed studs shall be replaced before installation of Durock Board.
Wall framing shall be designed not to exceed L/360 deflection. Steel framing must be 20-ga. or heavier with a corrosion-resistant metal coating equivalent to G60 hot dipped galvanized.
Floor application: Maximum joist spacing to be 24" o.c. The subfloor system should be designed with a minimum deflection limit of L/360 for the span.

3.02 INSTALLATION

- A. Install in accordance with manufacturer's instructions and recommendations.
- B. Space wood and steel framing a maximum of 16" o.c.
- C. Provide and install cementitious backer board as back-up behind all areas where ceramic tile or stone wall base are scheduled and in any additional areas noted on the drawings or in the specifications.
- D. Panel Wall Application: Pre-cut board to required sizes and make necessary cut-outs. Fit ends and edges closely but not forced together. Stagger end joints in successive courses.
Fasten boards to wood studs spaced max. 16" o.c. and bottom plates with 1-1/4" Durock Wood Screws or 1-1/2" galvanized roofing nails spaced 8" o.c.
Fasten boards to steel studs spaced max. 16" o.c. and bottom runners with 1-1/4" Durock Steel Screws space 8" o.c. with perimeter fasteners at least 3/8" and less than 5/8" from ends and edges.

In double-layer walls where backer boards are installed over base-layer gypsum boards, apply a water barrier (not a vapor retarder) over gypsum boards. Prefill joints with tile-setting mortar or adhesive and then immediately embed tape and level the joints. As an alternate, apply Durock Interior Tape over the joints and then apply tile-setting mortar or adhesive, forcing it through the tape to completely fill and level the joints. This may require several passes to accomplish.

After tub, shower pan or receptor is installed, place temporary 1/4" spacer strips around lip of fixture. Install board abutting top of spacer strip.

3.03 JOINT TREATMENT APPLICATION FOR UNTILED AREA

- A. For small areas where the Durock Board will not be tiled, such as a board extending beyond the tiled area and abutting another surface, treat joints as follows. Seal tile backer board with thinned ceramic tile mastic. (Mix four parts adhesive with one part water.) Embed Sheetrock Joint Tape over joints and treat fasteners with Sheetrock Setting-Type 45 or 90 Joint Compound applied in conventional manner. Flat trowel Sheetrock Setting-Type Joint Compound over board to cover fasteners and fill voids to a smooth surface. Finish joints with at least two coats Sheetrock Ready-Mixed Joint Compound. Do not apply ready-mixed joint compound over unsealed board.

3.04 CLEANING

- A. Clean work under provisions of Section 01 70 00.

END OF SECTION

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SECTION 09 30 13

CERAMIC TILE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Ceramic tile application where indicated.

1.02 REFERENCES

- A. ANSI/TCA A118.4 - Latex-Portland Cement Mortar.
- B. ANSI/TCA A136.1 - Organic Adhesives for Installation of Ceramic Tile, Type 1 and Type 2.
- C. ANSI/TCA A137.1 - Specifications for Ceramic Tile.
- D. ASTM C-150, Type 1 - Portland Cement Mortar
- E. TCA (Tile Council of America) - handbook for Ceramic Tile Installation.

1.03 SUBMITTALS

- A. Submit product data for ceramic tile under provisions of Section 01 33 00.
- B. Submit product data indicating material specifications, characteristics, and instructions for using adhesives and grouts.
- C. Submit samples for ceramic tile under provisions of Section 01 33 00.

1.04 QUALITY ASSURANCE

- A. Conform to TCA Handbook for Ceramic Tile Installation.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and protect products under provisions of Section 01 60 00.
- B. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Do not install adhesives in a closed, unventilated environment.
- B. Maintain 50 degrees F during installation of mortar materials and for 7 days after completion.

- C. All materials are to be low VOC.

1.07 MAINTENANCE DATA

- A. Submit maintenance data on all materials under the provisions of Section 01 78 00.
- B. Submit data including cleaning methods, solutions recommended, and stain removal methods.

1.08 WARRANTY

- A. Provide five year warranty under provisions of Section 01 78 00.
- B. Warranty: Include coverage for defective material.

1.09 EXTRA MATERIALS

- A. Furnish under provisions of Section 01 78 00.
- B. Supply minimum 2% of each tile used and properly packaged for long term storage.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Dal-Tile
- B. Other Acceptable Manufacturers
 - 1. American Olean
 - 2. Florida Tile
- C. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS

NEW TOWN HALL

- A. Floor Tile
 - Style: Volume 1.0
 - Size to be 12" x 24".
 - Pattern: Staggered brickwork
- B. Wall Tile
 - Style: Annapolis gloss bevel
 - Size to be 6" x 16".
 - Pattern: 1/3 offset

POLICE HEADQUARTERS

A. Floor Tile

Mosaic floor tile: Porcelain type unglazed ceramic tile. Absorption less than 0.5%, color to be integral and homogeneous through the unglazed body. Size to be 2"x2", of combination color and pattern as selected by Owner. Provide all necessary trim and accessories as required. Colors as selected by Owner from a combination of price groups 1, 2 and 3, allowing a 25/50/25 percentage mix for a pattern to be determined.

B. Wall tile

Glazed wall tile. Absorption less than 0.5%, color combination and pattern as selected by Owner. Size 4 1/4"x4 1/4", base to match wall tile in all respects. Provide all necessary trim and accessories as required. Colors as selected by Owner from a combination of price groups 1, 2 and 3, allowing a 25/50/25 percentage mix for a pattern to be determined.

BOTH BUILDINGS

A. Thresholds:

1. Provide a threshold of Panna Beige marble or light grey veined Missouri or Vermont marble with a sand-rubbed finish. Color selected by Owner. Corners and unprotected edges shall be beveled and rabbeting shall be provided for jambs. Top of the threshold shall be flush with the top of the adjacent ceramic tile floor. Thresholds shall be tapered as required to meet handicap codes.

B. Grout: Latex-Portland Cement grout conforming to ANSI A118.6. Color to be selected by Owner.

PART 3 - INSTALLATION

3.01 EXAMINATION

- A. Verify that surfaces are ready to receive work, and that substrate has cured a minimum of 28 days.
- B. Beginning of installation means installer accepts condition of existing substrate.

3.02 PREPARATION

- A. Protect surrounding work from damage or disfiguration.
- B. Vacuum clean existing substrate and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

3.03 INSTALLATION

A. THINSET METHOD

1. Floors: Tile shall be installed in accordance with TCA-F113 latex portland cement mortar.

2. Walls - All wall tile installed over cementitious backer board is to be installed in accordance with TCA-W244 latex portland cement mortar.
3. Walls - All wall tile installed over masonry is to be installed in accordance with TCA-W202 with latex portland cement mortar.
4. Shower Walls and Receptor - All wall tile installed over cementitious backer board is to be installed in accordance with TCA-W244 with latex portland cement mortar and the waterproofing membrane specified herein.
Use in conjunction with TCA-B415 for shower receptor.
5. Shower Walls and Receptor - All wall tile installed over masonry is to be installed in accordance with TCA-W202 with latex portland cement mortar and the waterproofing membrane specified herein.
Use in conjunction with TCA-B421 for shower receptor.

3.04 APPLICATION

- A. Lay tile to pattern.
- B. Place edge strips to exposed tile edges.
- C. Cut and fit tile tight to penetrations through tile. Form corners and bases neatly. Align floor and base joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
- E. Sound tile after setting. Replace hollow sounding units.
- F. Keep control joints free of adhesive or grout.
- G. Allow tile to set for a minimum of 48 hours prior to grouting.
- H. Grout tile joints.
- I. Apply sealant to junction of tile and dissimilar materials and at junction of dissimilar planes.

3.05 CLEANING

- A. Upon completion of the various portions of his work, the tile contractor shall remove all unused materials, rubbish, etc., that have accumulated as a result of this work.
- B. After the pointing has sufficiently set or hardened, all tile on walls and vertical surfaces, or floors and horizontal surfaces, shall be thoroughly cleaned in an approved manner. All traces of cement or dust accumulations shall be completely removed. In cases where acid solutions are required to clean the face of the finished tile work of surplus grouting or mortar used for pointing, all exposed

hardware shall be first covered by a heavy coating of vaseline to protect the metal from the possible effects of the acid or its fumes. Acid solution shall not be used for cleaning glazed tile.

- C. The Tile Contractor shall give the tile work one thorough final cleaning when so instructed.

3.06 PROTECTION OF FINISHED WORK

- A. Protect finished work under provisions of Section 01 70 00.
- B. Protect finished floor with heavy covering during construction.
- C. Do not permit traffic on floor for a minimum of 7 days after grouting.

END OF SECTION

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SECTION 09 51 23

ACOUSTICAL CEILING SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The furnishing and installation of acoustical and suspension ceiling systems.

1.02 REFERENCES

- A. Federal Specification SS-S-118B acoustical tile and panel properties.
- B. AMA 1-11 - Sound transmission
- C. ASTM C423 - Sound absorption
- D. ASTM C635 - Metal suspension system properties
- E. ASTM C636 - Acoustical ceiling system installation procedures
- F. UL - Underwriters Laboratories, Inc.

1.03 SYSTEM DESCRIPTION

- A. Acoustical material and suspension systems, including all necessary hangers, hanger wires, grillage, splines, and supporting hardware, shall be furnished and installed as required to create a completed ceiling system.

1.04 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Include manufacturer's specifications of materials and installation instructions.
- C. Samples: Submit two 6" x 12" samples of panels and two of the metal suspension system.
- D. Test reports: Submit data indicating the following ratings:
 - NRC (Noise reduction coefficient)
 - CAC (Ceiling Attenuation Class)
 - Light reflectance.
 - Flame spread
 - Smoke developed

1.05 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Section 01 78 00.

- B. Submit cleaning and maintenance data including procedures for stain removal and cleaning.

1.06 QUALITY CONTROL

- A. Work shall be performed in accordance with Section 01 45 00.

1.07 QUALIFICATIONS

- A. Installer: Company specializing in installing suspended acoustical ceilings with minimum of three years documented experience.

1.08 REGULATORY REQUIREMENTS

- A. Conform to the manufacturer's recommendations to achieve the fire resistive ratings as listed by Underwriters Laboratories, Inc. (Class A)
- B. All building areas designated to be fire rated or as required by State and Local Codes and scheduled for a suspended ceiling system shall receive a fire resistant system to meet U.L. requirements.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
- B. Storage shall be in building, closed to the weather with temperatures ranging from 60°F to 85°F at not more than 70% relative humidity.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Do not install acoustical ceiling system when building. Interior temperature is below 60°F, above 90°F or above 70% relative humidity.
- B. These conditions shall be maintained 24 hours prior to, during and after installation.

1.11 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on drawings. Any inconsistencies shall be reported to the Owner prior to installation.

1.12 SEQUENCING

- A. Installation of panels may commence only after an inspection of all electrical, mechanical and plumbing work has been completed.

1.13 COORDINATION

- A. Coordinate work under provisions of Section 01 31 00.

1.14 WARRANTY

- A. Provide 10 year warranty for the standard acoustical ceiling system under provisions of Section 01 78 00.
- B. Provide 15 year warranty for the moisture resistant acoustical ceiling system under provisions of Section 01 78 00.

1.15 EXTRA MATERIALS

- A. Furnish under provisions of Section 01 78 00.
- B. Provide minimum of 10 panels or 1% of the total of each type of panel installed. (which ever is greater) The additional panels shall be properly packaged for long term storage.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Acoustical panels
 - 1. Armstrong
 - 2. Other acceptable manufacturers offering equivalent products.
 - a. USG
- B. Suspension System
 - 1. Armstrong
 - 2. Other acceptable manufacturers offering equivalent products.
 - a. Chicago Metallic Corp.
 - b. USG
- C. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS (as listed on finish schedule)

- A. Acoustical Panels
 - 1. Type "ACT" - Acoustical ceiling tile
 - a. Fine Fissured Square Lay-in
(Model no. 1831: 24"x24" FireGuard) (Model no. 1830: 24"x48" FireGuard)
(See reflected ceiling plan for location of different sizes)
 - 1. Water felted mineral fiber panel with white vinyl paint finish.
 - 2. Square Lay-in, 5/8" thick
 - 3. Light reflectance = 0.85
 - 4. Flame spread = 25 or less
 - 5. Smoke developed = 50 or less
 - 6. Class A fire rating per ASTM E1264

7. NRC = 0.55
 8. CAC = 35
 9. Total recycled content: minimum 51%
 2. Type "MRT" – Moisture Resistant Tile
 - a. Georgian – High Washability, Unperforated.
(Model no. 794: 24"x24")
 1. Mineral fiber panel, vinyl latex paint finish and HumiGuard Plus.
 2. Color: White
 3. Square Lay-in, 5/8" thick
 4. BioBlock Plus antimicrobial treatment.
 5. Light reflectance = 0.88
 6. Flame spread = 25 or less per ASTM E84
 7. Smoke developed = 50 or less per ASTM E84
 8. Class A fire rating per ASTM E1264
 9. NRC = N/A
 10. CAC = 33
 11. Total recycled content: minimum 51%
 12. Meets USDA/FSIS guidelines for use in food processing establishments.

B. Suspension Systems

1. Standard Exposed Grid (Coordinate with ACT tile)
 - a. Prelude XL
 1. Hot dipped galvanized steel with white baked polyester paint finish.
 2. Intermediate duty main runners and cross tees with 15/16" flange face.
 3. Wall angles shall be straight edge and corner caps shall be of same materials and finish.
 4. Suspend with galvanized steel wire.
 5. Total recycled content: minimum 25%
2. Moisture Resistant Exposed Grid (Coordinate with MRT tile)
 - a. Prelude XL with aluminum cap
 1. Hot dipped galvanized steel with white, factory painted aluminum cap.
 2. Intermediate duty main runners and cross tees with 15/16" flange face.
 3. Wall angles shall be straight edge and corner caps shall be of same materials and finish.
 4. Suspend with galvanized steel wire.
 5. Total recycled content: minimum 25%

C. Accessories

1. Retention Clips
 - a. Provide Retention Clips (Armstrong model 414 or equal) at all ceiling tiles in a vestibule containing a door leading to the exterior.
 - b. Minimum of four bearing down on each ceiling tile panel.

2.03 SIZE

- A. All ceiling panels shall be 2'x2' or 2'x4'.
(See reflected ceiling plans for the size to be used in each area)

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that all components in the ceiling plenum are installed. The building shall be in proper condition to receive the acoustical materials and suspension system before any of the material shall be installed. The acoustical material shall be installed under conditions of normal occupancy. All wet work shall be completed, dry, and the building fully enclosed.

3.02 PROTECTION

- A. Protect existing elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

- A. Install all acoustical materials and suspension systems in strict accordance with the manufacturer's instructions.
- B. Main runners shall be installed on 24 inch centers and suspended by hanger wire spaced not more than 48 inches on center along the main runners.
- C. Cross tees shall be 24 inches in length and shall be spaced 24 or 48 inches on center along the main runner to form 2'x2' or 2'x4' modules as scheduled on the drawings.
- D. Install wall moldings at intersection of suspended ceiling and all vertical surfaces.
- E. Miter corners where wall moldings intersect or install corner caps.
- F. The acoustical panels shall not be used to support any other materials except fiberglass thermal/sound control insulation installed in the thickness, density and manner specified by the manufacturer.

3.04 CLEANING

- A. Clean under provisions of Section 01 70 00.

END OF SECTION

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SECTION 09 65 00

RESILIENT FLOORING

PART 1 - GENERAL

1.01 WORK INCLUDES

- A. Installation of resilient flooring and accessories as indicated.

1.02 REFERENCES

- A. ASTM E84 - Surface Burning Characteristics of Building Materials.
- B. FS L-F-1641 - Floor Covering, Translucent or Transparent Vinyl Surface, with Backing.
- C. FS L-F-475 - Floor Covering, Vinyl Surface (Tile and Roll), with Backing.
- D. FS SS-T-312 - Tile, Floor: Asphalt, Rubber, Vinyl, Vinyl Composition.
- E. FS SS-W-40 - Wall Base: Rubber and Vinyl Plastic.

1.03 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01 33 00.
- B. Provide product data on specified products, describing physical and performance characteristics sizes, patterns and colors available.
- C. Submit samples under provisions of Section 01 33 00.
- D. Submit two samples 3 x 3 inches in size, illustrating the full range color and pattern for each floor material specified.
- E. Submit 6 inch long samples of base material for each color specified.
- F. Submit manufacturer's installation instructions under provisions of Section 01 33 00.

1.04 OPERATION AND MAINTENANCE DATA

- A. Submit cleaning and maintenance data under provisions of Section 01 78 00.
- B. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-finishing.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle work to site under provision of Section 01 60 00.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Store materials for three days prior to installation in area of installation to achieve temperature stability.
- B. Maintain minimum 70 degrees F air temperature at flooring installation areas for three days prior to, during, and 24 hours after installation of materials.

1.07 EXTRA MATERIALS

- A. Furnish under provisions of Section 01 78 00.
- B. Provide 20 sq. ft. of each color and pattern of floor material and 10 lineal feet of base of each material required for Project, for maintenance use.
- C. Clearly identify each box.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Vinyl Composition Tile (VCT) and Vinyl Tile (VT)
Subject to compliance with requirements of this Specification Section, provide products listed herein from the following:
 - 1. Basis of Design: Armstrong
- B. Vinyl base and edge guards
Subject to compliance with requirements of this Specification Section, provide products listed herein from the following:
 - 1. Basis of Design: Johnsonite
- C. Rubber stair treads, risers and floor landing tiles
Subject to compliance with requirements of this Specification Section, provide products listed herein from the following:
 - 1. Basis of Design: Johnsonite
- D. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS

- A. Vinyl composition tile (VCT as noted on finish schedule)
Armstrong Excelon Crown Texture (or equal), tile, 1/8" in thickness, 12" x 12".
- B. Vinyl Tile (VT as noted on finish schedule)
Armstrong: Natural Creations – ArborArt - City Mill (or equal)
0.125" (3.2 mm) overall thickness, 0.020" (0.50 mm) wear layer thickness,
embossed, 9" x 48" planks with Diamond 10 Technology.

- C. Vinyl Base (VB as noted on finish schedule)
4" high x rolled length, 1/8" thick with ribbed back. Seams will only be allowed on walls longer than 40'.
- D. Edge guards or Adaptors: Beveled type, matte finish; color as selected by Owner.
Johnsonite Model EG-G, H or J. Provide edge guards at all exposed edges.
Johnsonite Model CTA-A or CTA-D. Provide adaptors at all dissimilar materials (i.e. vinyl tile and carpet).
- E. Rubber stair treads: 12-1/4" in depth and tapering .210" to .113" with a 2" hinged square nose.
Provide companion rubber riser 1/8" gauge. Color to be manufacturer's standard solid or speckled as selected by Owner. Surface texture to be selected by Owner from manufacturer's standards.
The leading edge of all treads and at the nosing of both main and intermediate landings are all to have a full width, 2" inlaid grit tape in standard color as selected by Owner.
- F. Rubber floor landing tiles: 1/8" gauge rubber floor tile 24" x 24". Texture and color to be solid or standard marbleized as selected by Owner.

2.03 COLORS SELECTION

- A. All colors shall be selected by the Owner from the manufacturer's standard color selections.

2.04 ACCESSORIES

- A. Subfloor Filler: White premix latex; mix with water to produce cementitious paste. "Armstrong" S-180 Latex underlayment.
- B. Primers and Adhesives: Low VOC and waterproof; types recommended by flooring manufacturer for specific materials and as required to maintain product warranty.
- C. Sealer and Finish: Types recommended by resilient flooring materials manufacturer for material type and location.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft., and are ready to receive work.
- B. Documented moisture testing must be conducted on ALL concrete substrates, regardless of the grade level and age using both of the following methods.
 - 1. Test method ASTM F-1869 result is to be 5.0 lb. MVTR or lower.
 - 2. Test method ASTM F-2170 result to be less than 75 % RH.
 - 3. Concrete is to exhibit negative alkalinity, carbonization, or dusting.
- C. Beginning of installation means acceptance of existing substrate and site conditions.

3.02 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.
- B. Apply, trowel, and float filler to leave a smooth, flat, hard surface.
- C. Prohibit traffic from area until filler is cured.
- D. Vacuum clean substrate.

3.03 INSTALLATION - TILE MATERIAL

- A. Install in accordance with manufacturers' instructions.
- B. Mix tile from container to ensure shade variations are consistent.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Set flooring in place, press with heavy roller to attain full adhesion.
- E. Install tile with pattern grain alternating with adjacent unit to produce basket weave pattern unless otherwise directed by the Owner. Allow minimum 1/2 full size tile width at room or area perimeter.
- F. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.
- G. Install edge guards at unprotected or exposed edges, and where flooring terminates.
- H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- I. Provide a maximum of three tile colors per room arranged in a pattern to be determined.

3.04 INSTALLATION - BASE MATERIAL

- A. Fit joints tight and vertical.
- B. Miter internal corners. At external corners, use premolded units. At exposed ends use premolded units.
- C. Install base on solid backing. Bond tight to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.
- E. Install straight and level to variation of plus or minus 1/8 inch over 10 feet.
- F. Provide coved base at all hard surface flooring and straight base at all carpet.

3.03 INSTALLATION – VINYL TILE & RUBBER FLOOR LANDING TILES

- A. Install in accordance with manufacturers' instructions.
- B. Mix vinyl tile from container to ensure shade variations are consistent.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Set flooring in place, press with heavy roller to attain full adhesion.
- E. Install with minimum 1/2 full size tile width at room or area perimeter.
- F. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.
- G. Install edge guards at unprotected or exposed edges, and where flooring terminates.
- H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
- I. Clean finished floor thoroughly in accordance with manufacturer's instructions. The floor will be maintained as a No Polish, No Buffing finish.

3.06 PROTECTION

- A. Prohibit traffic on floor finish for 48 hours after installation.

3.07 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean surfaces in accordance with manufacturer's instructions.

3.08 INITIAL MAINTENANCE OF VCT FLOORING

- A. The following work shall be performed in accordance with manufacturer's recommended instructions.
 - 1. Vacuum thoroughly
 - 2. Do not wash floor for at least five days after installation.
 - 3. The floor may be cleaned after installation by damp-mopping with a very dilute, neutral detergent solution, carefully scrubbing black marks and excessive soil.
 - 4. Apply one coat of Armstrong S-495 (or equal) commercial floor sealer.
 - 5. Apply a minimum of three coats of Armstrong S-480 (or equal) floor finish to protect floor until regular maintenance procedures can be started.
 - 6. Allow at least 60 minutes drying time between applications of finish.
 - 7. Do not allow traffic on the floor for at least 8 hours after final coat of finish.
 - 8. High speed buff to a glossy finish.

END OF SECTION

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SECTION 09 65 36
STATIC DISSIPATIVE RESILIENT FLOOR TILE

PART 1 - GENERAL

1.01 THIS SECTION INCLUDES

- A. Installation of static dissipating resilient floor tile and accessories as indicated.

1.02 RELATED SECTIONS

- A. Section 09 65 00 – Resilient Flooring

1.03 QUALITY ASSURANCE AND REGULATORY REQUIREMENTS

- A. Provide static dissipative resilient tile, adhesive, copper grounding strips, and maintenance finish supplied by one manufacturer
- B. Meet the following fire test performance criteria:
 - 1. ASTM E 648 Critical Radiant Flux of 0.45 watts per sq. cm. or greater, Class I.
 - 2. ASTM E 662 (Smoke Generation) Maximum Specific Optical Density of 450 or less.

1.04 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01 33 00.
- B. Submit shop drawings, and manufacturer's technical data, installation and maintenance instructions for flooring and accessories.
- C. Submit the manufacturer's standard samples showing the required colors for flooring and applicable accessories under provisions of Section 01 33 00.
- D. Submit the manufacturer's certification that the flooring has been tested by an independent laboratory and complies with the required fire tests.
- E. Operation and Maintenance Data
 - 1. Submit cleaning and maintenance data under provisions of Section 01 78 00.
 - 2. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

1.05 ENVIRONMENTAL CONDITIONS

- A. Deliver materials in good condition to the jobsite in the manufacturer's original unopened containers that bear the name and brand of the manufacturer, project identification, and shipping and handling instructions. Deliver, store, protect, and handle work to site under provision of Section 01600.
- B. Store materials in a clean, dry, enclosed space off the ground, and protected from the weather and from extremes of heat and cold. Protect adhesives from freezing. Store flooring, adhesives and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.
- C. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 65°F and a maximum temperature of 100°F for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55°F in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances.

- D. Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond and moisture tests.

1.06 EXTRA MATERIALS

- A. Furnish under provisions of Section 01 78 00.
- B. Provide four tiles of each color and pattern of floor tile required for Project, for maintenance use.
- C. Clearly identify each box.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. 3M
Type: 8400 Static Control Floor Tile
- B. Substitutions: Under provisions of Section 01 60 00.

2.02 TILE FLOORING MATERIALS

- A. Provide Static Dissipative Tile (SDT) Flooring size to be 0.125 x 24.25 x 24.25 in. Colors and texture is to be dispersed uniformly throughout its thickness. Color and pattern to be selected by Owner from manufacturer's standard colors.

2.03 ADHESIVES

- A. Install using manufacturer recommended conductive adhesive with copper strips to connect to a ground point.

2.04 ACCESSORIES

- A. Provide transition/reducing strips tapered to meet abutting materials as required.
- B. Provide resilient edge strips as required.

2.05 WARRANTY

- A. Provide a 10 year material warranty and lifetime warranty on electrical performance.
Submit under provisions of Section 01 78 00.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.
- B. Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation,

dusting, mold, or mildew.

- C. Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.
- D. Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.
- B. Documented moisture testing must be conducted on ALL concrete substrates, regardless of the grade level and age using both of the following methods.
 - 1. Test method ASTM F-1869 result is to be 5.0 lb. MVTR or lower.
 - 2. Test method ASTM F-2170 result to be less than 75 % RH.
 - 3. Concrete is to exhibit negative alkalinity, carbonization, or dusting.

3.02 PREPARATION

- A. Smooth concrete surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, control or construction joints, and other defects with underlayment materials as recommended by the flooring manufacturer.
- B. Remove paint, varnish, oils, release agents, sealers, and waxes. Remove residual adhesives as recommended by the flooring manufacturer. Remove curing and hardening compounds not compatible with the adhesives used, as indicated by a bond test or by the compound manufacturer's recommendations for flooring. Avoid organic solvents.
- C. Vacuum or sweep clean surfaces to be covered immediately before the application of flooring. Make subfloor free from dust, dirt, grease, and all foreign materials.

3.03 INSTALLATION OF TILE FLOORING

- A. Install flooring in strict accordance with manufacturer's instructions.
- B. Scribe, cut, and fit to permanent fixtures, columns, walls, partitions, pipes, outlets, and built-in furniture and cabinets.
- C. Install flooring with adhesives, tools, and procedures in strict accordance with the manufacturer's written instructions. Observe the recommended adhesive trowel notching, open times, and working times.
- D. Install copper grounding strips into adhesive in strict accordance with manufacturer's written instructions.
- E. Roll tile with a 100-pound roller. Refer to specific rolling instructions of the tile manufacturer.
- F. Install wall base, edge strips, transition strips, and all other accessories in accordance with manufacturer's instructions.

3.04 PROTECTION

- A. Prohibit traffic on floor finish for 48 hours after installation.
- B. Protect installed flooring as recommended by the flooring manufacturer against damage from rolling loads, other trades, or the placement of fixtures and furnishings.

3.05 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean surfaces in accordance with manufacturer's instructions.
- C. No floor finishing required. Buff to a higher luster following installation.

END OF SECTION

SECTION 09 65 66

RESILIENT ATHLETIC FLOORING

PART 1 – GENERAL

1.01 SUMMARY

- A. Related Documents:
The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.02 SECTION INCLUDES

- A. Resilient athletic sheet flooring.
- B. Adhesive and accessories required for installation and maintenance.

1.03 RELATED SECTIONS

- A. Section 03 54 13 - Self-Leveling Underlayment
- B. Section 09 65 00 – Resilient Flooring

1.04 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: For each type of product indicated.
- C. Samples for Initial Selection: For each type of product indicated.
- D. Samples for Verification: For each type of product indicated, in manufacturer's standard-size samples of each resilient product color, texture, and pattern required.
- E. Product Schedule: For resilient products. Use same designations indicated on Drawings.

1.05 QUALITY ASSURANCE

- A. Mockups: Provide resilient products with mockups specified in other Sections.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle products under provisions of Section 01 60 00.
- B. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by Johnsonite, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

1.07 PROJECT CONDITIONS

- A. Install resilient products after other finishing operations, including painting, have been completed.
- B. Maintain ambient temperatures within range recommended by Johnsonite, but not less than 65 deg F (18 deg C) or more than 85 deg F (29 deg C) in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- C. Maintain the ambient relative humidity between 40% and 60% during installation.
- D. Until Substantial Completion, maintain ambient temperatures within range recommended by Johnsonite, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

1.08 WARRANTY

- A. Provide warranty under provisions of Section 01 78 00.
- B. Provide manufacturer's standard warranty.
- C. The flooring is warranted to be free from manufacturing defects for a period of three (3) years.

1.09 EXTRA MATERIALS

- A. Provide additional amount of approximately 3% of the total floor surface, (minimum of four tiles) of each type and color under provisions of section 01 78 00.
- B. Package as required for long term storage.

PART 2 – PRODUCT

2.01 MANUFACTURERS

- A. Subject to compliance with requirements of this Specification Section, provide products listed herein from the following:
 - 1. Basis of Design: Johnsonite
- B. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS

- A. Resilient Rubber Athletic Tile Flooring:
 - 1. REPLAY SQUARE EDGE TILE by Johnsonite
 - 2. Resilient Rubber Athletic Tile Flooring with the following physical characteristics:
 - a. Manufactured from a composition of recycled truck tire crumb rubber encapsulated in a urethane binder.
 - b. Overall thickness: 3/8" (9.5 mm).
 - c. Tile texture and color: Hammered Textured Speckled Color
 - d. Tile style and size: Square Edge (glue down) 24" X 24" (61 cm X 61 cm)
 - e. ASTM D 2240 Standard Test Method for Rubber Property—Durometer Hardness: 65 Shore A.
 - f. ASTM D 2047, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring or 0.6 or greater.
 - g. ASTM F 970, Standard Test Method for Static Load Limit – passes 250 PSI.
 - h. ASTM D 3389 Standard Test Method for Coated Fabrics Abrasion Resistance: < 1.00 gram weight loss.
 - i. ASTM D 2859 Standard Test Method for Ignition Characteristics of Finished Floor Covering Materials (Pill Test): passes with greater than 1" of un-charred area.
 - j. Replay Rubber Athletic Sheet Flooring contains 92% post-consumer recycled content
 - k. SCS FloorScore Certified and meets California Specifications Section 01350
 - l. Resilient Rubber athletic Flooring contains 7% rapidly renewable content
 - m. 100% Recyclable
 - n. Phthalate, chlorine and halogen-free

2.03 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation.
- B. Adhesives: As recommended by Johnsonite to meet site conditions.
 - 1. Resilient Rubber Athletic Flooring (For glue down tile only).
 - a. Johnsonite 965 Flooring and Tread Adhesive
 - b. Johnsonite 975 Two-Part Urethane Adhesive
 - c. Johnsonite 140 SpraySmart Adhesive

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

- D. Prepare substrates according to Johnsonite written instructions to ensure adhesion [or acceptance] of Resilient Athletic Flooring.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate paint, coatings and other substances that are incompatible with adhesives or contain soap, wax, oil, solvents, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 - 3. Mechanically remove contamination on the substrate that may cause damage to the resilient athletic flooring material. Permanent and non-permanent markers, pens, crayons, paint, etc., must not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.
 - 4. Prepare Substrates according to ASTM F 710 including the following:
 - a. For glue down tile:
 - 1) Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
 - 2) Perform relative humidity test using in situ probes, ASTM F 2170. Must not exceed 80%.
 - 3) A pH test for alkalinity must be conducted. Results should range between 7 and 9. If the test results are not within the acceptable range of 7 to 9, the installation must not proceed until the problem has been corrected.
 - 4) Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.
 - b. The floor must be rigid, free of movement.
- E. Fill cracks, holes, depressions and irregularities in the substrate with good quality Portland cement based underlayment leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- F. Floor covering shall not be installed over expansion joints.
- G. Do not install resilient products until they are same temperature as the space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- H. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.02 RESILIENT ATHLETIC FLOORING INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient athletic flooring.
- B. Resilient Athletic Rubber Sheet Flooring:
 - 1. Install with Johnsonite adhesive specified for the site conditions and follow adhesive label for proper use.
 - 2. Install rolls in sequential order following roll numbers on the labels.
 - 3. Reverse sheets unless instructed otherwise in Johnsonite Installation Instructions.
 - 4. Roll the flooring in both directions using a 100 pound three-section roller.

3.03 CLEANING AND PROTECTION

- C. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- D. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- E. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
 - 1. No traffic for 48 hours after installation.
 - 2. No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.
- F. Wait 72 hours after installation before performing initial cleaning
- G. A regular maintenance program must be started after the initial cleaning.

END OF SECTION

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SECTION 09 67 23

RESINOUS EPOXY FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Related Documents:
The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.2 SECTION INCLUDES

- A. Substrate preparation
- B. Waterproofing.
- C. Resinous flooring.
- D. Integral base.
- E. Aggregate matrix system.
- F. Non-slip surface and topping.

1.3 SYSTEM DESCRIPTION

- A. System generally consists of:
 - 1. Preparing substrate.
 - 2. Applying a cementitious urethane based self-leveling seamless flooring.
 - 3. Quartz aggregate broadcast and urethane/epoxy topcoat.
 - 4. Owner selected color and texture.
 - 5. Nominal thickness of 3/16 inch.
 - 6. Integral cove base.
 - 7. Non-slip finish.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
 - 1. Product Data: Manufacturer's literature including installation instructions, use restrictions and limitations.
 - 2. Shop drawings: Layout of area to be finished showing any required expansion joints, construction joints and cove base assembly. Show all termination details and any floor drain connections. Show patterns, borders and changes in colors required.
 - 3. Initial Selection samples: Provide samples of color and material ranges, not less than 6 inches square and showing system thickness and all system components.
 - 4. Verification: Submit final samples of selected products. Include samples showing full variation of color and finish expected.
 - 5. Maintenance Data: Provide recommended maintenance procedures.
 - 6. Certification: Certify submitted materials comply with requirements.
 - 7. Certification: Certify substrate moisture content, condition and capacity is acceptable.
- B. Field Moisture Test Reports: Submit moisture test results.
- C. Mock-Up/Field Samples: Prior to installation, provide mock up of each type of system proposed for use for approval. Accepted mock-ups may be incorporated into the work unless otherwise noted.

1. Apply full-thickness mockups on 48-inch- (1200-mm-) square floor area selected by Owner.
 - a. Include 48-inch (1200-mm) length of integral cove base.
 - b. Include applications to demonstrate non-slip finish textures and options, not less than 6 square feet each.
- D. Product Test Reports: Submit manufacturer's certified independent lab test reports not more than 2 years old documenting product performance.

1.5 QUALITY ASSURANCE

- A. Manufacturer experience: Not less than 5 years experience in manufacture and support of resinous industrial flooring.
- B. Applicator: Approved by manufacturer for surface preparation and application of specified product.
- C. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, through one source from a single manufacturer, with not less than 5 years of successful experience in manufacturing and installing principal materials described in this section. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.
- D. Manufacturer Field Technical Service Representatives: Resinous flooring manufacture shall retain the services of Field Technical Service Representatives who are trained specifically on installing the system to be used on the project.
- E. Field Technical Services Representatives shall be employed by the system manufacture to assist in the quality assurance and quality control process of the installation and shall be available to perform field problem solving issues with the installer.
- F. Pre-installation conference: Held at site to review specifications, application procedure, quality control, inspection and acceptance criteria.

1.6 PRODUCT REQUIREMENTS

- A. Deliver, store and handle products under provisions of Section 01 60 00.
 1. Do not deliver panels until job is ready for installation.
 2. Store products in ventilated dry area; protect from dampness, freezing, and direct sun light.
 3. Maintain temperatures below 85 °F and above 60 °F.
 4. Prevent breakage of containers.
 5. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

1.7 PROJECT CONDITIONS

- A. Site Requirements
 1. Provide air, material and substrate temperatures between 60 F and 85 F providing substrate temperature is above its dew point. Outside of this range, consult Manufacturer in writing.
 2. Relative humidity: Maintain 24 hours before and after installation less than 85%

- and surface temperature shall be at least 5 degrees F above dew point.
3. Provide lighting equal to final lighting level during the preparation and installation of system.

- B. Conditions of new concrete to be coated with cementitious urethane material.
 1. New concrete: Moisture cured for 7 days minimum and have fully cured for 28 days in accordance with ACI-308 prior to the application.
 2. Conduct moisture tests of surfaces no sooner than 28 days after concrete installation and within 3 days of coating application.
 3. Outside of these parameters consult manufacturer in writing.
 4. Concrete finish: Flat rubbed finish, float or light steel trowel finish.
 5. Concrete with hard steel trowel finish: Not permitted for application.
 6. Sealers and curing agents should not to be used.

1.8 SEQUENCING & SCHEDULING

- A. Ensure new and existing concrete surfaces are clean and properly prepared in time for surfaces to be sufficiently dry and cured for proper application for flooring.

1.9 WARRANTY

- A. Provide manufacture's standard warranties.

PART 2 – PRODUCTS

2.1 RESINOUS EPOXY FLOORING SYSTEMS (See drawings for installation locations)

- A. Manufacturers:
 1. Stonehard; www.stonhard.com/.
 2. General Polymers
 3. Dur-A-Flex; <http://dur-a-flex.com/>.
 4. National Polymers Inc. Epoxy mortars, towel applied systems.
- B. Basis of design:
 1. Stonhard, Inc.; Stonclad GS®. With top coat Stonkote HT, with texture.
- C. System Characteristics:
 1. Color and Pattern: Selected by Owner from manufacturer standards.
 2. Integral Cove Base: Provide at all adjacent walls.
 3. Overall System Thickness: nominal 3/16 inch
- D. System Components: Manufacturer's standard components that are compatible with each other and as follows:
 1. Primer:
 - a. Material Basis: Stonhard Standard Primer
 - b. Resin: Epoxy
 - c. Formulation Description: (2) two component, 100 percent solids.
 - d. Application Method: Squeegee and roller.
 - e. Number of Coats: (1) one.
 2. Mortar Base:
 - a. Material design basis: Stonclad GS
 - b. Resin: Epoxy.
 - c. Formulation Description: (3) three component, 100 percent solids.

- d. Application Method: Metal Trowel.
 - 1) Thickness of Coats: nominal 3/16 inch.
 - 2) Number of Coats: One.
 - e. Aggregates: Pigmented Blended aggregate.
 - 3. Top Coat:
 - a. Material design basis: Stonkote HT4, apparatus floor application.
 - b. Resin: Bisphenol F epoxy coating.
 - c. Formulation Description: (2) two component 100 percent solids.
 - d. Type: pigmented.
 - e. Finish: standard, but including Texture #2 and #3 where required for non-slip formulation.
 - f. Number of Coats: one.
- E. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:
- 1. Compressive Strength: 10,000 psi after 7 days per ASTM C 579.
 - 2. Tensile Strength: 1,750 psi per ASTM C 307.
 - 3. Flexural Strength: 4,000 psi per ASTM C 580.
 - 4. Water Absorption: < 1% per ASTM C 413.
 - 5. Impact Resistance: > 160 in. lbs. per ASTM D 2794.
 - 6. Flammability: Class 1 per ASTM E-648.
 - 7. Hardness: 85 to 90, Shore D per ASTM D 2240.

2.2 ACCESSORY MATERIALS

- A. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.
- B. Joint Sealant: Type recommended or produced by resinous flooring manufacturer for type of service and joint condition indicated. Allowances should be included for Stonflex MP7 joint fill material, and CT5 concrete crack treatment.
- C. Pitching materials: If required, provide Stonset TG5 for pitch work
 - 1. Three component epoxy grout system not less than 1 coat

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine and verify conditions per Section 01 70 00 and as follows:
 - 1. Verify substrates and underlying work is within tolerances specified.
 - 2. Verify structural components are properly placed.
 - 3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. New and existing concrete surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, and bituminous products.
- B. Moisture Testing: Perform tests recommended by manufacturer and as follows.

1. Perform relative humidity test using is situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.
 2. If the relative humidity exceeds 75% then the Owner shall be notified and advised of additional cost for the possible installation of a vapor mitigation system that has been approved by the manufacturer or other means to lower the value to the acceptable limit.
 3. Perform relative humidity test using is situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.
 4. If the relative humidity exceeds 75% install moisture mitigation system prior to resinous flooring installation.
- C. Mask and protect areas, surfaces and openings not part of this work from adverse affections of preparation and installation
- D. Mechanical surface preparation Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum profile of CSP 4-5 as described by the International Concrete Repair Institute.
1. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.
 2. Wherever a free edge will occur, including doorways, wall perimeters, expansion joints, columns, doorways, drains and equipment pads, a 1/4 inch deep by 3/16 inch wide keyways shall be cut in.
 3. Cracks and joints (non-moving) greater than 1/4 inch wide are to be chiseled or chipped-out and repaired per manufacturer's recommendations.
 4. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufactures recommendations.

3.3 APPLICATION

- A. General: Apply system in 3 distinct steps as follows:
1. Substrate preparation
 2. Topping/overlay application
 3. Topcoat application, with an anti-slip aggregate broadcast.
- B. Application start-up:
1. Immediately prior to application of system components, dry surfaces and remove dust and loose particles with vacuum or clean, dry, oil-free compressed air.
 2. Handle, mix and add components to achieve desired results and per manufacturer's recommendations.
 3. Follow substrate contour pitching or leveling surface.
- C. Apply primer where required by resinous system, over prepared substrate at manufacturer's recommended spreading rate.
- D. Integral Cove Base: Stonclad GS mortar, apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details

including those for taping, mixing, priming, troweling, sanding, of cove base. Round internal and external corners.

1. Integral Cove Base: Height 4 inches.

E. Topping:

1. Apply topping as a self-leveling system. The topping shall be applied in one lift.
2. Nominal thickness of one lift: 3/16 inch.
3. Topping components: Resin, hardener and filler all supplied by single manufacturer.
4. Hardener: Add to resin and thoroughly disperse by manufacturer recommended mechanical means. Add aggregate catalyzed mixture and mix to achieve a homogenous blend.
5. Apply topping over horizontal surfaces using pin rakes, trowels or other approved systems.
6. Immediately after placing, degass topping with 15/16 inch spiked roller.
7. Broadcast quartz aggregate into wet material at rate of 1 lbs./sf or more to flood and overtop surface.
8. Allow material to fully cure. Vacuum, sweep and/or blow to remove loose aggregate.

F. Topcoat:

1. Mix and apply per manufacturer recommended procedure.
2. Topcoat components: Resin, hardener and filler as supplied by single manufacturer.
3. Apply topcoat at rate of 70 sf per kit (0.85 gal).
4. Non-Skid coating: Broadcast at rate of 1 lb. per 100 sf and back roll into coating.

3.4 TERMINATIONS

- A. Chase edges to “lock” the flooring system into the concrete substrate along lines of termination.
- B. Penetration Treatment: Lap and seal resinous system onto the perimeter of the penetrating item by bridging over compatible elastomer at the interface to compensate for possible movement.
- C. Treat floor drains by chasing the flooring system to lock in place at point of termination.

3.5 JOINTS AND CRACKS

- A. Treat control joints to bridge potential cracks and to maintain monolithic protection.
- B. Treat cold joints and construction joints to bridge potential cracks and to maintain monolithic protection on horizontal and vertical surfaces as well as horizontal and vertical interfaces.
- C. Discontinue floor coating system at vertical and horizontal contraction and expansion joints by installing backer rod and compatible sealant after coating installation is completed. Provide sealant type recommended by manufacturer for traffic conditions and chemical exposures to be encountered.

3.6 FIELD QUALITY CONTROL

- A. Applicator Testing and Inspecting: Provide the following: Temperature: Air, substrate temperatures, relative humidity, and, dew point.
 - 1. Coverage rates: Monitor quantity of material used on area covered.
- B. Tolerances: Comply with dimensional and location tolerances specified in applicable sections, and as follows:
 - 1. Horizontal Lines and Levels: level by more than 1/8 inch in 10 feet, or 1/4 inch maximum.

3.7 ADJUSTING / CLEANING / PROTECTION

- A. Comply with Section 01 70 00 and the following:
 - 1. Adjusting; Cleaning; Protection:
- B. Cure flooring material in compliance with manufacturer's directions, taking care to prevent their contamination during stages of application and prior to completion of the curing process.
 - 1. Remove masking. Perform detail cleaning at installation completion leaving clean, smooth, unblemished surface

END OF SECTION

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SECTION 09 68 13

CARPET TILE

PART 1 - GENERAL

1.01 SUMMARY

- A. Related Documents:
The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.02 SECTION INCLUDES

- A. Prepare surfaces to receive carpet tiles.
- B. Install carpet tile on surfaces where indicated, complete with required accessories.
- C. Install edge guards where carpeting terminates at other floor finishes.

1.03 RELATED WORK

- A. Section 03 54 13-Self-Leveling Underlayment
- B. Section 09 65 00 - Resilient Flooring

1.04 DESIGN REQUIREMENTS

- A. Carpet tiles shall be installed in all areas indicated on drawings and finish schedule. All design and color combinations shall be installed as per drawings.

1.05 SUBMITTALS

- A. Submit samples under provisions of Section 01 33 00.
- B. Submit minimum 3"x5" carpet sample of each color of manufacturer's standard colors for Owner's selection.
- C. Design/Builder shall submit larger samples of any standard color if requested by the Owner.
- D. Submit product information indicating conformance with fire code requirements for finishes.

1.06 REGULATORY REQUIREMENTS

- A. Materials must be tested and in compliance with State Code Standards for interior finishes.
- B. Carpet is to meet the following fire code requirements:
 - 1. Flame radiant panel test: Meets NFPA Class 1 when tested under ASTM E-648.

2. Smoke density: NBS smoke chamber NFPA-258 (ASTM E 662) – Less than 450 Flaming Mode

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Maintain room temperature at minimum 60 degrees F for at least 24 hours prior to installation, and relative humidity at approximately that at which the area is to be maintained. The maximum room temperature shall be 90 degrees F. at any time during the installation.
- B. Provide sufficient lighting.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products under provisions of Section 01 60 00.

1.09 CARPET IDENTIFICATION: All carpeting delivered to the project for installation shall have proper identification. Labels shall include data relative to manufacturer, quality, lot number, characteristics and color. Carpeting not conforming to the specifications or Owner's approved selection will not be acceptable.

1.10 FIELD MEASUREMENT

- A. Verify all dimensions at site prior to installation.

1.11 SCHEDULING

- A. Do not commence with carpet tile installation until painting and finishing work is complete and ceilings and overhead work, tested, approved, and completed.

1.12 EXTRA MATERIALS

- A. Furnish under provisions of Section 01 78 00.
- B. Provide minimum of 4 carpet tiles of each color and type of tile installed. The additional tiles shall be properly packaged for long term storage.

1.13 WARRANTY

- A. Provide lifetime warranty, as noted below, under provisions of Section 01 78 00.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements of this Specification Section, provide products listed herein from one of the following:
 1. Interface
 2. Mohawk

3. Shaw

B. Basis of Design: Mohawk

C. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS

A. Carpet Tile (CPTT as noted on finish schedule)

1. Product Data	
Collection Name	Get Smart
Carpet style name	Kinesthetic
Style number	GT317
Construction:	Tufted
Dye method	Solution dyed
Fiber product	duracolor Premium nylon
Backing Material	EcoFlex NXT
Gauge	1/12
Size	12" x 36"

B. Adhesive: As recommended by the carpet manufacturer to conform to carpet warranty.

1. VOC Limits: Provide adhesives with VOC content not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA method 24).

C. Carpet colors selected by Owner from standard colors.

PART 3 - EXECUTION

3.01 EXAMINATION

A. All floors should be tested for moisture: the presence of moisture will interfere with adhesion.

B. The floor must be free of all foreign matter; grease, oil, paint, wax, dirt, dust, oil or noncompatible adhesives.

C. The floor should be sound and level. All holes, compound and any protrusions must be eliminated.

3.02 FLOOR PREPARATION

A. Concrete (unsealed): Floor must be sealed. Use a compatible non-silicone base sealer or latex primer or latex additives.

B. Concrete with latex adhesive in good condition: No treatment needed except vacuuming.

3.03 INSTALLATION

- A. Install carpet tile in accordance with manufacturer's instructions.
- B. Verify with Owner the pattern to install tiles prior to start of installation.
- C. Measure the area to find the best starting point that would utilize a maximum size perimeter tile. In some cases, due to doorways or partition, the starting point is not the center of the room.
- D. After selecting the starting point, snap chalk lines that bisect this point at right angles. In order to achieve a perfect right angle, which is critical, form a triangle by measuring 6'x8'x10'.
- E. The chalk lines must be used as a guide for lining up the edges of modules. Using the pyramiding technique, install one quadrant at a time.
- F. The corners of the modules should be flat to assure proper fit. To avoid jamming install modules with slight space about 1/32 or so. We suggest the following spot check: Ten modules, properly spaced, should measure 1/4" to 1/2" over net.
Caution! Do Not Jam Modules.
- G. Use a steel wheel seam roller or similar roller to blend and enhance the seams.

3.04 CLEANING

- A. Clean work under provisions of 01 70 00.
- B. All trash, wrapping paper, selvages shall be removed from the job site. All large excess pieces of usable carpet shall be left with the Owner for future repairs.
- C. Perform the following operations immediately after installing carpet:
 - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
 - 2. Remove yarns that protrude from carpet surface.
 - 3. Vacuum carpet using commercial machine with face-beater element.

3.05 PROTECTION OF FINISHED WORK

- A. Prohibit traffic on new carpet tile flooring for 24 hours after the completion of installation.
- B. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period.

END OF SECTION

SECTION 09 68 14

ENTRANCE CARPET TILE

PART 1 - GENERAL

1.01 SUMMARY

- A. Related Documents:
The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.02 SECTION INCLUDES

- A. Prepare surfaces to receive entrance carpet tiles.
- B. Install entrance carpet tile on surfaces where indicated, complete with required accessories.
- C. Install edge guards where carpeting terminates at other floor finishes.

1.03 RELATED WORK

- A. Section 03 54 13 - Self-Leveling Underlayment
- B. Section 09 65 00 - Resilient Flooring

1.04 DESIGN REQUIREMENTS

- A. Entrance carpet tiles shall be installed in all areas indicated on drawings and finish schedule. All design and color combinations shall be installed as per drawings.

1.05 SUBMITTALS

- A. Submit samples under provisions of Section 01 33 00.
- B. Submit minimum 3"x5" carpet sample of each color of manufacturer's standard colors for Owner's selection.
- C. Design/Builder shall submit larger samples of any standard color if requested by the Owner.
- D. Submit product information indicating conformance with fire code requirements for finishes.

1.06 REGULATORY REQUIREMENTS

- A. Materials must be tested and in compliance with State Code Standards for interior finishes.
- B. Carpet is to meet the following fire code requirements:
 - 1. Flame radiant panel test: Meets NFPA Class 1 when tested under ASTM E-648.

2. Smoke density: NBS smoke chamber NFPA-258 (ASTM E 662) – Less than 450 Flaming Mode

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Maintain room temperature at minimum 60 degrees F for at least 24 hours prior to installation, and relative humidity at approximately that at which the area is to be maintained. The maximum room temperature shall be 90 degrees F. at any time during the installation.
- B. Provide sufficient lighting.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products under provisions of Section 01 60 00.

1.09 FIELD MEASUREMENT

- A. Verify all dimensions at site prior to installation.

1.10 SCHEDULING

- A. Do not commence with carpet tile installation until painting and finishing work is complete and ceilings and overhead work, tested, approved, and completed.

1.11 EXTRA MATERIALS

- A. Furnish under provisions of Section 01 78 00.
- B. Provide minimum of 4 carpet tiles of each color and type of tile installed. The additional tiles shall be properly packaged for long term storage.

1.12 WARRANTY

- A. Provide lifetime warranty under provisions of Section 01 78 00.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements of this Specification Section, provide products listed herein from one of the following:
 1. Interface
 2. Shaw
- B. Basis of Design: Shaw
- C. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS

- A. Entrance Carpet Tile (ECT as noted on finish schedule)
1. Product Data

Style Name	Bon Jour II
Style number	5T032
Product type	walk-off tile, tile
Size	24" X 24"
Construction	needlebond rib
Dye method	100% solution dyed
Fiber product	100% PET POLYESTER
Primary backing	SYNTHETIC
Secondary backing	ecoworx®
Tufted yarn weight	50.4 ozs/yd ²
Pile height	0.197 inches
Average density	5,284 ozs./yd ³
Recommended installation	linear
 2. Performance:

Flame radiant panel test:	Meets NFPA Class 1 when tested under ASTM E-648 glue down.
Smoke density:	NBS smoke chamber NFPA-258 (ASTM E 662) – Less than 450
 3. Warranty: Lifetime of carpet
 4. Standard color selection: Minimum of eight (8) colors
- B. Adhesive: As recommended by the carpet manufacturer to conform to carpet warranty.
1. VOC Limits: Provide adhesives with VOC content not more than 50 g/L when calculated according to 40 CFR 59, Subpart D (EPA method 24).
- C. Carpet colors selected by Owner from manufacturer's Standard colors.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. All floors should be tested for moisture: the presence of moisture will interfere with adhesion.
- B. The floor must be free of all foreign matter; grease, oil, paint, wax, dirt, dust, oil or noncompatible adhesives.
- C. The floor should be sound and level. All holes, compound and any protrusions must be eliminated.

3.02 FLOOR PREPARATION

- A. Concrete (unsealed): Floor must be sealed. Use a compatible non-silicone base sealer or latex primer or latex additives.

- B. Concrete with latex adhesive in good condition: No treatment needed except vacuuming.

3.03 INSTALLATION

- A. Measure the area to find the best starting point that would utilize a maximum size perimeter tile. In some cases, due to doorways or partition, the starting point is not the center of the room.
- B. After selecting the starting point, snap chalk lines that bisect this point at right angles. In order to achieve a perfect right angle, which is critical, form a triangle by measuring 6'x8'x10'.
- C. The chalk lines must be used as a guide for lining up the edges of modules. Using the pyramiding technique, install one quadrant at a time.
- D. The corners of the modules should be flat to assure proper fit. To avoid jamming install modules with slight space about 1/32 or so. We suggest the following spot check: Ten modules, properly spaced, should measure 1/4" to 1/2" over net.
Caution! Do Not Jam Modules.
- E. Use a steel wheel seam roller or similar roller to blend and enhance the seams.

3.04 CLEANING

- A. Clean work under provisions of 01 70 00.

3.05 PROTECTION OF FINISHED WORK

- A. Prohibit traffic on new carpet tile flooring for 24 hours after the completion of installation.

END OF SECTION

SECTION 09 81 16

SOUND ATTENUATION INSULATION

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Sound attenuation insulation for walls.

1.02 SUBMITTALS

- A. Submit product data and manufacturer's installation instructions under provisions of Section 01 33 00.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products under provisions of Section 01 60 00.
- B. Store in a dry, protected area.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Roxul AFB (Acoustical Fire Batt) by Roxul Inc.
- B. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS

- A. Sound attention batts: Unfaced mineral wool fiber, non-combustible insulation designed for sound attenuation.
3-1/2" thick in partitions
- B. Material Properties
1. Compliance and Performance:

ASTM C 665 Mineral-Fiber Blanket Thermal Insulation Type 1,	Complies
ASTM C 553 Mineral Fiber Blanket Thermal Insulation	Complies
UL Design Nos U305, U311, U317, U411, U412, U448, U465, V417, V418, V419	
 2. Fire Performance:

ASTM E 136 Behaviour of Materials at 750°C (1382°F)	Non-Combustible
ASTM E84 (UL 723) Surface Burning Characteristics	
Flame Spread = 0	
Smoke Developed = 0	
 3. Acoustical Performance:

ASTM E 90 Airborne Sound Transmission Loss	Tested
ASTM E 413 Rating Sound Insulation	Tested

- | | |
|--|----------|
| ASTM C 423 Sound Absorption Coefficients | Tested |
| ASTM E 1050 Impedance and Absorption of Acoustical Materials | Tested |
| 4. Air Erosion: | |
| UL 181 Maximum Air Velocity | 1000 fpm |
| 5. Corrosive Resistance: | |
| ASTM C 665 Corrosiveness to Steel | Pass |
| 6. Recycled content to be 40% pre-consumer minimum. | |
| C. Acoustical Putty | |
| 1. QuietPutty 380 manufactured by Pabco Gypsum or equal. | |
| 2. Description: Moldable sheets of fire rated, acoustical putty to be used to seal penetrations in partitions that are constructed with sound attenuation insulation. Use putty to maintain the performance of acoustically rated walls at penetrations. | |
| 3. Surface burning requirements: (ASTM E84) Flame Spread 15, Smoke developed: 250, Classification: A. | |
| 4. One hour fire-rated to UL 1479 | |
| 5. Install in accordance with manufacturer's instructions. | |

PART 3 - EXECUTION

3.01 PREPARATION

- A. Verify adjacent materials are dry and ready to receive installation.
- B. Verify mechanical and electrical services within walls have been installed and tested.

3.02 INSTALLATION

- A. Install batt insulation in accordance with manufacturer's instructions.
- B. Install acoustical insulation of 3 1/2" thickness in all new steel stud partitions.
- C. Install batt insulation in spaces without gaps or voids.
- D. Trim insulation neatly to fit spaces. Use batts free of damage.
- E. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation. Leave no gaps or voids.
- F. Install acoustical putty in accordance with manufacturer's instructions in locations as noted below.
 - 1. Acoustical putty is to be installed at all partitions where sound attenuation insulation is being installed so as to maintain the performance of acoustically rated walls.
 - 2. Install as required to seal around the entire back of all electrical boxes penetrating gypsum board.
 - 3. Install as required to seal all gaps where items penetrate gypsum board, such as HVAC ductwork, piping, conduits, cables, etc.

3.03 CLEANING

- A. Clean under provisions of Section 01 70 00.

END OF SECTION

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SECTION 09 91 00

PAINTING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Finish painting and priming of all items exposed and identified to receive a finish.

1.02 RELATED SECTIONS

- A. Examine the specifications for the various other trades and become thoroughly familiar with all their provisions regarding what they are painting. All surfaces that are left unfinished by the requirements of other specifications shall be painted or finished as a part of this work.

1.03 REFERENCES

- A. ANSI/ASTM D16 - Definitions of Terms Relating to Paint, Varnish, Lacquer, and Related Products.
- B. ASTM D2016 - Test Method for Moisture Content of Wood.
- C. Federal Specifications

1.04 DEFINITIONS

- A. Conform to ANSI/ASTM D16 for interpretation of terms used in this Section.
- B. The term "paint" as used herein includes enamels, paint, emulsions, varnishes, stains, sealers and other coatings whether used as prime, intermediate or finish coats.

1.05 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Submit manufacturer's technical data sheet and Material Safety Data Sheets (MSDS) for each scheduled coating, giving the descriptive data, curing time, mixing, thinning and application instructions. Provide certification that paint was formulated within lead or mercury.
- C. Submit manufacturer's fan deck of color chips for selection of colors by the Owner.
- D. Samples
 - 1. At the request of the Owner, prepare and submit paint samples on the materials he requires for approval.
 - 2. Prepare and submit stained wood samples on the type and quality of wood specified for use on the project as requested by the Owner.

- E. Submit a list of all interior paints and coatings used in the project that are addressed by the Green Seal Standard GS-11 and state the Volatile Organic Compounds (VOC) content for each product.

1.06 QUALIFICATIONS

- A. Product Manufacturer: Company specializing in manufacturing quality paint and finish products with five years experience.
- B. Applicator: Company specializing in commercial painting and finishing with 3 years documented experience.

1.07 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame/fuel/smoke rating requirements for finishes.

1.08 FIELD SAMPLES

- A. At the request of the Owner, provide field sample panel, one complete surface of each color scheme illustrating special coating, color, texture, finish and workmanship.
- B. Locate where directed by the Owner.
- C. If approved, sample area will serve as a minimum standard for Work throughout the building. Accepted sample may remain as part of the Work.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and protect products under provisions of Section 01 60 00.
- B. Deliver all paint materials to the job site ready mixed and in their original containers with all labels intact and legible at time of use.
- C. Store only the approved materials at the job site, and store only in a suitable and designated area restricted to the storage of paint materials and related equipment.
- D. Use all means necessary to insure the safe storage and use of paint materials.
- E. All soiled or used rags, waste and trash must be disposed off site every night and every precaution taken to avoid the danger of fire.
- F. All materials must be stored at above freezing temperature.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F for 24 hours before, during, and 48 hours after application of finishes.
- B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent.

- C. Application Temperature for Paints: 50 degrees F minimum, and 95 degrees F maximum.
- D. Application Temperature for Varnish and Other Natural Finishes: 65 degrees F minimum and 90 degrees F maximum.
- E. Provide lighting level of 80 ft. candles measured mid-height at substrate surface.
- F. Do not apply paint to areas where dust is being generated.

1.11 COORDINATION

- A. Coordinate work under provisions of Section 01 31 00.

1.12 EXTRA MATERIALS

- A. Furnish under provisions of Section 01 78 00 extra paint equaling approximately 10% of each color and gloss used in each coating material used, tightly sealed in clearly labeled containers.
- B. The additional material shall be properly packaged for long term storage and delivered to the Owner.

PART 2 - PRODUCTS

2.01 MANUFACTURER:

- A. Acceptable manufacturers:
 - 1. Exterior Paint:
 - a. Sherwin Williams
 - b. Pittsburgh Paint
 - c. Benjamin Moore Paint
 - 2. Interior Paint:
 - a. Sherwin Williams
 - b. Pittsburgh Paint
 - c. Benjamin Moore Paint
 - 3. Transparent Finishes
 - a. Fine Paints of Europe: Eurolux Waterborne varnishes
 - b. Sutherland Welles Ltd.: Sutherland Wells Low-Toxic wood finishes.

NOTE: Varnish and stain to have a maximum VOC of 50.

- B. Substitutions: Under provisions of Section 01 60 00.

2.02 COMPATIBILITY:

- A. All paint materials and equipment shall be compatible in use; finish coats shall be compatible with prime coats; prime coats shall be compatible with the surface to be coated; all tools and equipment shall be compatible with the coating to be applied.
- B. Thinners, when used, shall be only those thinners recommended for that purpose by the manufacturer of the material to be thinned.

2.03 MIXING AND TINTING:

- A. Accomplish job mixing and tinting only when acceptable to the Owner. Mix only in mixing pails placed in suitable sized non-ferrous or oxide resistant metal pans.
- B. Tints and all other additives or thinners shall be used only as recommended by the manufacturer of the paint and as approved by the Owner.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
- B. In the event of discrepancy, immediately notify the Owner.
- C. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.02 PREPARATION:

- A. General
 - 1. Prior to all surface preparation and painting operations, completely mask, remove or otherwise adequately protect all hardware, accessories, machined surfaces, plates, lighting fixtures, and similar items in contact with painted surfaces but not schedule to receive paint.
 - 2. Remove all existing loose, flaking and poor condition paint by scraping and then sanding surface. Sand as required to feather edges of remaining paint.
 - 3. Spot prime all exposed nails and other metals that are to be painted with emulsion paints, using a primer recommended by the manufacturer of the coating system.
 - 4. Surface to be painted shall be thoroughly clean and dry. All concrete and masonry work shall be completely cured.
 - 5. All items concealing surfaces to be painted that are readily detachable shall be removed for the painting of said surface. Reinstall upon completion of space.
 - 6. Surfaces in spaces above suspended ceilings and chases are not required to be painted unless otherwise indicated.
 - 7. Doors shall be removed to paint the bottom edges.

8. Provide minimum of one coat of primer and minimum of two coats of finish paint. The shop priming coat, as occurring, shall substitute for the field applied primer coat.
9. Complete coverage is required. Provide additional coats to areas that do not show complete coverage.
10. All stains (water, smoke, etc.) on existing materials scheduled to be painted are to be primed with a stain blocker primer, Kilz Oderless or equal. Prime entire wall or ceiling to an edge. Provide two coats. This stain blocking primer may substitute for the primer required in the painting schedule.

B. Preparation of wood surfaces:

1. Clean all wood surfaces until they are free from dirt, oil, and all other foreign substance.
2. Smooth all finished wood surfaces exposed to view, using the proper sandpaper.
3. Where so required, use varying degrees of coarseness in sandpaper to produce uniformly textured and unmarred wood surfaces.
4. On small, dry, seasoned knots, thoroughly scrape and clean the surface and apply one coat of good quality knot-sealer before application of the priming coat.
5. On large, open, unseasoned knots, scrape off all pitch and thoroughly clean the area, followed by an application of one coat of good quality knot-sealer.
6. Back prime all wood mouldings and trim.
7. Fill nail holes, cracks, open joints and other defects with oil based putty after priming coat has dried. Color to match finish color.

C. Previously stained wood

1. Smooth and de-gloss all previously stained wood surfaces exposed to view, using the proper sandpaper. Remove paint completely from all previously painted roof components located within the stained wood areas. All poor condition varnish, if existing, is to be removed and all good condition varnish is to be sanded and de-glossed.
2. Clean all wood surfaces until they are free from dirt, oil, mortar and all other foreign substances.
3. Where so required, use varying degrees of coarseness in sandpaper to produce uniformly textured and unmarred wood surfaces.
4. Do not apply over lacquer or shellac.
5. Cover wood with two coats of clear satin polyurethane finish in accordance with manufacturer's instructions. Apply thin coats with a brush. Application by roller is not allowed. Sand lightly with a fine grit sandpaper between coats.

C. Preparation of metal surfaces:

1. Galvanized Metal
 - a. Clean all surfaces thoroughly with solvent until they are completely free from dirt, oil and grease.
 - b. Thoroughly treat the cleaned surface with phosphoric acid etch.
 - c. Remove all excess etching solution and allow to dry completely before application of paint.
 - d. Prepare surface in accordance with recommendations of directions of manufacturer of rust-inhibitive primer.

- e. New galvanized metal is to be allowed to weather 6 months prior to coating. If weathering is not possible, clean with solvents per manufacturer's instructions, and verify test patch adhesion with Owner.
- 2. Other Metals
 - a. Thoroughly clean all surfaces until they are completely free from dust, dirt, oil, loose rust and grease.
 - b. All shop-primed surfaces that have been marred or abraded shall be wire-brushed and touched up with the same material as the shop coat prior to painting of surfaces.
- 3. Preparation of existing aluminum surfaces:
 - a. Thoroughly clean all surfaces per manufacturer's instructions until they are completely free from dirt, oil and grease.
 - b. Apply a test area, allow paint to dry one week before testing adhesion. If adhesion is poor, discuss solutions with Owner.
 - c. Do not use hydrocarbon solvents for cleaning.
- D. Preparation of Concrete and Masonry
 - 1. Concrete and masonry shall be repaired before painting.
 - 2. Dirt, fungus, grease and oil shall be removed prior to application of paint by washing with a solution composed of from 2 to 8 ounces of tri-sodium phosphate per gallon of hot water and then rinsing thoroughly with fresh water.
 - 3. Efflorescence shall be removed from concrete and masonry surfaces by scraping, wire brushing and washing with 5 to 10 percent solution of muriatic acid and then washing thoroughly with fresh water.
 - 4. Unless otherwise recommended by the manufacturer of the paint materials as approved, all concrete and masonry surfaces to be painted shall be given a neutralizing treatment consisting of 2 pounds of zinc-sulfate in one gallon of warm water. The neutralizer shall be applied liberally and allowed to dry, following which the surfaces shall be rinsed thoroughly with clean water and allowed to dry for not less than 48 hours before paint is applied.
- E. Preparation of Gypsum Wallboard
 - 1. All surfaces must be thoroughly clean and joint treatment dry.
 - 2. Steel corner beads shall be spot primed before water based paint is applied.
 - 3. Do not apply solvent based coatings directly over unpainted wallboard.
- F. Preparation of Plaster Surfaces
 - 1. All holes and cracks in plaster surfaces shall be filled with patching plaster before painting.
 - 2. Before painting plaster, the surfaces shall be tested with a moisture-testing device. Paint or sealer shall not be applied on plaster when the moisture content exceeds 5.5 percent. Test sufficient areas in each space as often as necessary to determine the proper moisture content for painting.

3.03 APPLICATION

A. General

1. Apply all paint in accordance with manufacturer's instructions.
2. Do not apply the initial coating until moisture-meter reading of the surface is within limits recommended by the paint materials manufacturer.
3. Allow sufficient drying time between coats in accordance with manufacturer's recommendations.
4. Oil base and Oleo resinous solvent type paints shall be considered dry for recoating when the paint feels firm, does not deform or feel sticky under moderate pressure of the thumb, and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
5. Schedule all cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
6. Sand, dust, and clean between coats to remove all defects visible to the unaided eye from a distance of five feet.
7. Finished surfaces shall be free from runs, drops, ridges, waves, laps, sags and unnecessary brush marks.
8. Slightly vary the color of succeeding coats.
9. Primer and intermediate coats shall be tinted to approximately the tint of finish coats.
10. Damaged painting shall be retouched before applying the succeeding coat.
11. Do not apply additional coats until completed coat has been inspected and approved by the Owner.
12. Only inspected and approved coats of paint will be considered in determining the number of coats applied.
13. Edges of paint abutting other materials or colors shall be clean and sharp with no overlapping.
14. Refinish entire wall where portion of finish has been damaged or is not acceptable.
15. Refinish all woodwork that has been removed and reset.
16. Paint all exposed, plastic drain pipes, electrical conduits, uninsulated metal piping, ceiling & wall access panels, sprinkler piping and ductwork, unless otherwise noted. Verify with Owner prior to painting these items.
17. Colors will be selected by Owner from manufacturer's full color palette.
18. Unlimited number of different colors allowed per project. Multiple colors are allowed per room. Opposite sides of door frames, window frames and doors may be painted different colors at Owner's discretion. Number of colors is to be determined by Owner and included in a color schedule that will be assembled after submittal of color sample fanex by the Design/Builder prior to commencement of work.
19. All steel door frames are to be painted using a brush or roller and back-brushed.

3.04 STAIN & VARNISH PREPARATION AND APPLICATION

- A. Prepare and apply stain and varnish in accordance with manufacturer's instructions.
- B. Do not apply at temperatures lower than 50°F or under high humidity conditions. Surface must be dry, clean and free from grease.

- C. New woodwork: Apply stain and then three coats of varnish. Allow at least a four hour interval for drying between coats. Sand lightly between coats with 220 grit paper or finer and tack dust free. Follow manufacturer's instructions if thinning is required.
- D. Old intact (sound) clear varnish work: Old coats of varnish must be sanded thoroughly. Clean the surface and sand well with 220 grit paper. Remove sanding dust, wash thoroughly with TSP solution, rinse thoroughly and allow to dry. From this point, following instructions above for new floors and woodwork.
- E. Newly varnished floors should be allowed to dry for at least 2 days before exposure to heavy traffic. Floors may be walked on 4 hours after application in stocking feet.
- F. Upon completion of varnishing on floor, gently and lightly buff the finish twenty four hours after the application of the final coat with 0000 steel wool. This will make the finish uniform and remove slight imperfections resulting from airborne dust.
- G. Apply varnish with a first quality synthetic brush or lamb's wool applicator
- H. Clean-Up is accomplished using warm water and detergent immediately after use
- I. Drying: Dust free in 45 minutes; recoatable in 4 hours

3.04 CLEANING

- A. Prevent accidental spilling of paint materials and, in event of such spill, immediately remove all spilled material, the waste of equipment used to clean up the spill, and wash the surfaces to their original undamaged condition.
- B. After completion of the painting work, all glass shall be cleaned on both sides by professional window cleaners. The use of acid solution or water containing caustic soaps will not be permitted. The edge of compound shall not be disturbed by scrapers. Upon completion of contract, the glass shall be left whole, free of any defacements or rattle and shall be clean on both sides.
- C. Prior to final inspection visually inspect all surfaces and remove all paint and traces of paint from surfaces not scheduled to be painted.
- D. Paint storage space shall be thoroughly cleaned following the completion of all work.
- E. All waste materials shall be disposed of properly and in accordance with all Federal, State, and Local regulations. Do not dispose of waste materials in the building sanitary waste system.

3.05 WASTE MANAGEMENT

- A. Set aside extra paint for future color matches. All paint unused by the Design/Builder is to be delivered to the Owner in sealed containers.

- B. Close and tightly seal all partly used paint and finish containers and store in a well-ventilated, safe area at moderate temperature.
- C. Do not dispose of paints or solvents by pouring on ground. Place in designated containers for proper disposal.

3.06 PAINTING SCHEDULE

- A. Exterior: Based on Sherwin Williams Paints.
 - 1. Wood
 - 1st Coat: S-W Exterior Oil Based Primer
(4 mils wet, 1.4 mils dry)
 - 2nd & 3rd Coats: S-W Resilience Latex Satin K43 Series
(4 mils wet, 1.52 mils dry per coat)
 - 2. Ferrous Metals (doors, frames, steel)
 - 1st Coat: S-W Pro Industrial Pro-Cryl Universal Primer, B66-310 Series
(5-10 mils wet, 2-4 mils dry)
 - 2nd & 3rd Coats: S-W Pro Industrial DTM Acrylic Semi-Gloss, B66 Series
(4 mils wet, 1.5 mils dry per coat)
 - 3. Galvanized Metal (designated to be painted)
 - 1st Coat: S-W Galvite HS, B50WZ30
(7 mils wet, 4.5 mils dry)
 - 2nd & 3rd Coats: S-W All Surface Enamel, A11 Series
(4 mils wet, 1.6 mils dry per coat)
 - 4. Concrete and Masonry Walls
 - 1st Coat: S-W Loxon Block Surfacers
(50 – 100 sq ft/gal)
 - 2nd & 3rd Coats: S-W Resilience Latex Satin K43 Series
(4 mils wet, 1.52 mils dry per coat)
 - 5. PVC, Plastic
 - 1st Coat: 1 coat S-W Adhesion Primer latex, B51W8050
(4 mils wet, 1.7 mils dry)
 - 2nd & 3rd Coats: 2 coats S-W Resilience Exterior Gloss K44
(4 mils wet, 1.6 mils dry per coat)
 - 6. Existing Aluminum
 - 1 coat - Spray Application: S-W DTM Bonding Primer, B66A50
(5 mils wet, 2 mils dry minimum)
 - 2 coats - Spray Application: S-W Pro Industrial DTM Acrylic Semi-Gloss B66- Series
(6 mils wet, 2.5 mils dry per coat minimum)

B. Interior: Based on Sherwin Williams Paints.

1. Interior clear floor sealer for concrete floors listed in finish schedule to receive sealer:
 - a. Sealer Finish 1 coat TK-Tri-Siloxane 290 VOC as manufactured by TK Products.
Tel: 952-938-7223
www.tkproducts.com
2. CEMENT - (Walls & Ceilings, Poured Concrete, Precast Concrete, Unglazed Brick, Cement Board, Cast-In-Place)
Eg-Shel / Satin Finish
 - 1st Coat: S-W Loxon Block Surfacers
(16 mils wet, 8 mils dry)
 - 2nd & 3rd Coats: S-W ProMar 200 Zero VOC Latex Eg-Shel B20-2600 Series,
(4 mils wet, 1.6 mils dry per coat)
3. METAL - (Galvanized)
Eg-Shel / Satin Finish
 - 1st Coat: S-W ProCryl Universal Primer, B66-310 Series (110 g/L)
(2-4 mils dry)
 - 2nd & 3rd Coats: S-W Pro Industrial DTM Acrylic Eg-Shel B66-660 Series
(6.0 mils wet, 2.5mils dry)
4. METAL - (Structural Steel Columns, Joists, Trusses, Beams, Miscellaneous & Ornamental Iron, Structural Iron, Ferrous Metal, steel pipe railings) (exposed, uninsulated metal piping and ductwork)
Eg-Shel / Satin Finish
 - 1st Coat: S-W ProCryl Universal Primer, B66-310 Series (110 g/L)
(4 mils wet, 1.6 mils dry)
 - 2nd & 3rd Coats: S-W Pro Industrial DTM Acrylic Eg-Shel B66-660 Series
(6.0 mils wet, 2.5mils dry per coat)
5. METAL - (Ceilings; Structural Steel, Joists, Trusses, Beams, Ferrous Metal)
Dryfall Waterborne Topcoats
Eg-Shell Finish
 - 1st Coat: S-W ProCryl Universal Primer, B66-310 Series (110 g/L)
(2-4 mils dry)
 - 2nd & 3rd Coats: S-W Waterborne Acrylic Dry Fall, B42W2 (58 g/L)
6. WOOD - (Walls, Ceilings, Doors, Trim,)
Eg-Shell / Satin Finish
 - 1st Coat: S-W Premium Wall & Wood Primer B28 Series
(4 mils wet, 1.3 mils dry per coat)
 - 2nd & 3rd Coats: S-W ProMar 200 Zero VOC Latex Eg-Shel B20-2600 Series
(4 mils wet, 1.7 mils dry per coat)

7. DRYWALL - (Walls, Ceilings, Gypsum Board, etc.)
Eg-Shell / Satin Finish
1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W2600
(4 mils wet, 1.5 mils dry).
2nd & 3rd Coats: S-W ProMar 200 Zero VOC Latex Eg-Shel B20-2600 Series
(4 mils wet, 1.7 mils dry per coat)
8. CEILINGS – (Plaster)
Flat Finish
1st Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28W2600
(4 mils wet, 1.5 mils dry).
2nd & 3rd Coats: S-W ProMar Ceiling Paint Latex Flat, A27W05050 Series
(4 mils wet, 1.2 mils dry per coat).
9. CONCRETE BLOCK

1st Coat: S-W Loxon Block Surfacers
(16 mils wet, 8 mils dry)
2nd & 3rd Coats: S-W ProMar 200 Zero VOC Latex Eg-Shel B20-2600 Series
(4 mils wet, 1.7 mils dry per coat)
10. CONCRETE BLOCK (Glazed Finish) - Special Wall Glaze (SWG on finish schedule)
1st Coat: S-W Kem Cati-Coat HS B42 Series
(14 mils wet- 10 mils dry)
2nd & 3rd Coats: S-W Pro Industrial Water Based Epoxy B73W00311 Series
(5.0 mils wet-2.0 mils dry per coat)
11. STAINED WOOD (trim, floors)

3 Coats of satin varnish, lightly sanded between coats.
a. Stain coat: 1 coat Stain
b. Seal coat: 1 coat Clear Satin Finish
c. First coat: 1 coat Sanding Sealer
d. Finish coat: 1 coat Clear Satin Finish
(Apply in accordance with manufacturer's instructions)

END OF SECTION

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SECTION 10 21 1.19

PLASTIC TOILET PARTITIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Furnish and install all plastic toilet partitions with doors, accessories and appurtenances, complete, in accordance with the specifications and drawings. Style to be floor mounted and overhead braced.

1.02 RELATED SECTIONS

- A. Section 09 30 13 - Ceramic Tile

1.03 SUBMITTALS

- A. Submit shop drawings and product data and color samples under provisions of Section 01 33 00.

1.04 REGULATORY REQUIREMENTS

- A. Meet all State and Federal Handicap Accessibility Codes.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.

1.06 COORDINATION

- A. Coordinate work under provisions of Section 01 31 00.

1.07 WARRANTY

- A. Provide a fifteen year warranty under provisions of Section 01 78 00.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Subject to compliance with requirements of this Specification Section, provide products listed herein from one of the following:
 - 1. Accurate Partitions Corporation
 - 2. General Partitions
 - 3. Scranton Products (Santana/Comtec/Capitol)
- B. Basis of Design: Accurate Partitions Corporation

- C. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS

A. Door, Panels, Pilaster and Urinal Screens

1. Shall be 1" thick (door and panels 55" high, pilasters 82" high) High-Density Polyethylene (HDPE) polymer that is water resistant and non-absorbent.
2. The HDPE material shall have homogenous color throughout each component with 1/4" machined edges for uniformity. Surface finish shall resist markings from pens, pencils and other writing instruments.
3. Color to be selected by Owner from manufacturer's standard colors. Color of plastic trim shoes to match the panels.

B. Hardware

1. Hinges:
 - a. Continuous Hinge: Doors shall be hung on a continuous contact piano hinge, made of satin, anodized extruded aluminum and shall weigh not less than 1.5 pounds per foot. Knuckles shall have nylon separators. Pivot pin shall be 1/4" type 304 stainless steel. All fasteners shall be 3/4" tamperproof screws located 8" on-center on door and pilaster. Fasteners shall be concealed under a snap-on cover. Cover shall be fastened top and bottom with 5/8" stainless steel tamperproof screws. Hinge shall have internal spring which is adjustable to hold door open or closed as required.
2. Brackets: All panel brackets are to be continuous, full height, Satin anodized Type 6463-T5 aluminum, attached with tamperproof screws. Panels and bracket connection shall be through bolted with tamper resistant barrel nuts and shoulder screws.
3. Latches: All slide latches, strikes, door pulls, keepers and coat hook/bumpers are to be manufacturer's standard hardware with a brushed aluminum alloy to resist corrosion and through bolted with tamper resistant barrel nuts and shoulder screws. Latches for accessible toilet compartments are to meet all state code requirements for accessibility.
4. Compartments shall be supplied with all hardware and fasteners for a complete installation.

C. Construction Design

1. Partitions shall be anchored to the floor with a 1/4" x 1" stainless steel mounting bar attached to the bottom of the pilaster. Floor anchoring system shall be secured to the floor with 3/8" stainless steel anchors. The mounting system shall be capable of leveling as required.
 - a. The mounting system shall be concealed by molded plastic trim shoes secured with two metal clips incorporated into the floor anchor assembly. Color of plastic trim shoes to match the panels.

- b. Provide clear satin anodized aluminum heat sink channel along bottom edge of all partition panels and doors.
- 2. Aluminum headrail with anti-grip profile shall provide overhead bracing and span all compartments and brace the end pilaster to the back wall. Aluminum to be clear satin anodized.
- 3. Urinal screens are to be attached to the wall with a continuous aluminum bracket and floor to ceiling mounted with a 1-3/4" x 1-3/4" aluminum post. Provide structure above ceiling as required to rigidly brace post. Screen size to be 28" x 55".

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install partitions rigid, straight, plumb and level in accordance with manufacturer's instructions. Set units with not more than 1/2" between pilasters and panels and not more than 3/4" between panels and walls.
- B. Secure to structural concrete floor and walls with tamperproof screws and conical plastic anchors (Provide 2" x 6" wood blocking for fastening partitions to drywall construction).
- C. Evidence of drilling in floors and walls shall be concealed in the finished work.
- D. Adjust and lubricate hardware for proper operation after installation.
 - 1. Hinges on in-swing doors are factory set to hold doors in the open position when unlatched as shown on drawings.
 - 2. Hinges on out-swing doors are factory set to return to the fully closed position.

3.02 CLEANING

- A. Clean work under provisions of Section 01 70 00.
- B. Remove protective plastic coating.
- C. Clean exposed surfaces of compartment systems using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage during remainder of construction period.

END OF SECTION

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SECTION 10 28 13

TOILET ROOM ACCESSORIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The furnishing and installation of toilet room accessories as shown on drawings and herein specified.

1.02 RELATED SECTIONS

- A. Section 09 21 16 – Steel Framed Drywall Systems
- B. Section 10 21 13.19 - Plastic toilet partitions

1.03 SUBMITTALS

- A. Submit under provisions of Section 01 33 00
- B. Product data: Include manufacturer's illustration of item and installation instructions.
- C. Samples: Provide one sample of item if requested by the Owner. (Sample will be returned)

1.04 QUALITY CONTROL

- A. Work is to be performed in accordance with Section 01 45 00.

1.05 REGULATORY REQUIREMENTS

- A. Conform to all applicable Federal, State and local codes and laws including the state accessibility code for location and height requirements.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect, and handle products to site under provisions of Section 01 60 00.

1.07 FIELD MEASUREMENTS

- A. Verify conditions with field measurements. Any inconsistencies or conflicts shall be reported to the Owner prior to installation.

1.08 COORDINATION

- A. Coordinate work under provisions of Section 01 31 00.

- B. Coordinate the work with finish installers, and Design/Builder for all wall openings, blocking, anchors, etc.
- C. The Owner will supply the surface mounted paper towel dispensers, soap dispensers and toilet tissue dispensers from their Vendor. Coordinate with the Owner for receipt of these items. Design/Builder is to install them in locations as directed by the Owner and as listed in this section's schedule. All installations are to meet state accessibility code location and height requirements. Design/Builder is to provide all blocking as required in stud walls.

1.09 WARRANTY

- A. Provide warranty under provisions of Section 01 78 00.
- B. The bathroom accessories shall be warranted for one year from the date of purchase.

1.10 OPERATION AND MAINTENANCE

- A. All keys, tools and instruction sheets supplied by the manufacturer are to be turned over to the owner.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Subject to compliance with requirements of this Specification Section, provide products listed herein from one of the following:
 - 1. American Specialties, Inc.
 - 2. A&J Washroom Accessories, Inc.
 - 3. Bobrick Washroom Equipment, Inc.
- B. Basis of Design: Bobrick Washroom Equipment, Inc. and American Specialties, Inc.
- C. Substitutions: Under provisions of Section 01 60 00.

2.02 PRODUCT LIST

- A. Mirror (Bobrick B-2908 or ASI 0600-B) - Stainless steel angle frame with tempered glass mirror. Provide concealed wall hanger with theft resistant locking device.
- B. Grab Bars
 - 1. All grab bars are of 18 gauge, 1-1/2" diameter, all satin finish, concealed mounting plate and theft resistant screws. (ASI has a snap-on flange cover)
 - a. Straight grab bar (Bobrick B-6806 or ASI 3801)
- C. Feminine napkin disposal
(Bobrick B-270 or ASI Type 20852) surface mounted

- D. Shower curtain rod
(Bobrick B-6047 or ASI Type 1204) extra heavy duty, 18 gauge 1-1/4" diameter rod. Provide stainless steel hooks.
- E. Shower curtain
Shower curtain material is to be Sure-Chek linen as manufactured by Herculite, Inc. or equal. Color as selected by Owner from manufacturer's standard colors.
Material to be flame resistant meeting or exceeding Federal Specifications. Material shall also be stain resistant, antistatic, odor resistant, and antimicrobial.
- F. Janitor's shelf and hook strip
(Bobrick B-239 or ASI Type 1308-3) 34" long with shelf, 3 rubber mop holders and 4 hooks
- G. Robe hook
(Bobrick B-6707 or ASI Type 7340)
- H. Baby Changing Station
(Koala Kare Model KB200, horizontal, polypropylene, wall mounted - Color selected by Owner)

2.03 MATERIALS

- A. Sheet Steel: ASTM A366, cold rolled stretcher leveled; 125 oz/sq. ft. galvanized coating.
- B. Stainless Steel Sheet: ASTM A167, commercial grade, 22 gauge.
- C. Stainless Steel Tubing: ASTM A269, commercial grade, seamless welded.
- D. Adhesive: Epoxy type contact cement.
- E. Fasteners, Screws, and Bolts: Hot dip galvanized. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.04 FINISHING

- A. All accessories shall be stainless steel with a satin finish except if specified otherwise in the schedule.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Provide rough-in dimensions and/or templates to site as required.
- B. Verify exact location of accessories with the Owner prior to installation.
- C. Provide all blocking, backup, anchors, mounting kits, etc. as required to install accessories.

3.02 INSTALLATION

- A. Install accessories in accordance with manufacturer's specifications and instructions.
- B. Install accessories plumb, square and level.
- C. Accessories shall be anchored securely.
- D. All items shall be attached with theft resistant fasteners.

3.03 CLEANING

- A. Clean work under provisions of Section 01 70 00.
- B. Protective plastic cover shall remain on accessories until all finishes and tile cleaning is completed.
- C. Upon installation and cleaning by all other trades, the protective covers may be removed and the accessories cleaned as recommended by the manufacturer.
- D. Do not use steel wool or other abrasives on stainless steel.

3.04 ACCESSORY SCHEDULE

NEW TOWN HALL

Women's Room B10, 104, 113, 202

Each to have:

- 1 mirror 18"W x 30"H
- 1 42" grab bar
- 1 36" grab bar
- 1 18" grab bar (vertical)
- 1 paper towel dispenser (Supplied by Owner)
- 1 soap dispenser (Supplied by Owner)
- 1 feminine napkin disposal
- 1 toilet tissue dispenser (Supplied by Owner)
- 1 robe hook
- 1 Baby Changing Station (Rooms 104 & 113 only)

Men's Room B11, 105, 112, 203

Each to have:

- 1 mirror 18"W x 30"H
- 1 42" grab bar
- 1 36" grab bar
- 1 18" grab bar (vertical)
- 1 paper towel dispenser (Supplied by Owner)
- 1 soap dispenser (Supplied by Owner)
- 1 toilet tissue dispenser (Supplied by Owner)
- 1 robe hook
- 1 Baby Changing Station (Rooms 105 & 112 only)

Janitor Closet B13

- 1 Janitor's shelf and hook strip

POLICE HEADQUARTERS

Women's Room B12

- 1 mirror 18"W x 30"H
- 1 42" grab bar
- 1 36" grab bar
- 1 18" grab bar (vertical)
- 1 paper towel dispenser (Supplied by Owner)
- 1 soap dispenser (Supplied by Owner)
- 1 feminine napkin disposal
- 1 toilet tissue dispenser (Supplied by Owner)
- 3 robe hooks
- 2 Shower Curtain Rods
- 2 Shower Curtains

Women's Locker Room B13

- 1 mirror 24"W x 72"H

Women's Room 102

- 1 mirror 18"W x 30"H
- 1 42" grab bar
- 1 36" grab bar
- 1 18" grab bar (vertical)
- 1 paper towel dispenser (Supplied by Owner)
- 1 soap dispenser (Supplied by Owner)
- 1 feminine napkin disposal
- 1 toilet tissue dispenser (Supplied by Owner)
- 1 robe hook

Men's Locker Room B19

- 3 mirrors 18"W x 30"H
- 1 mirror 24"W x 72"H
- 2 paper towel dispensers (Supplied by Owner)
- 2 soap dispensers (Supplied by Owner)

Men's Room B20

- 1 42" grab bar
- 1 36" grab bar
- 1 18" grab bar (vertical)
- 1 toilet tissue dispenser (Supplied by Owner)
- 2 robe hooks
- 2 Shower Curtain Rods
- 2 Shower Curtains

Men's Room 103, 113

Each to have:

- 1 mirror 18"W x 30"H
- 1 42" grab bar
- 1 36" grab bar
- 1 18" grab bar (vertical)
- 1 paper towel dispenser (Supplied by Owner)
- 1 soap dispenser (Supplied by Owner)
- 1 toilet tissue dispenser (Supplied by Owner)
- 1 robe hook

Janitor Closet B10

- 1 Janitor's shelf and hook strip

END OF SECTION

SECTION 10 44 13

FIRE EXTINGUISHERS & CABINETS

PART 1 - GENERAL

- 1.01 **SCOPE:** Provide and install Fire Extinguisher Cabinets and Fire Extinguishers as herein specified in quantities and locations per state codes and laws.

PART 2 - PRODUCTS

- 2.01 **COMPONENTS:** Cabinets (Architectural Series) and Extinguishers shall be as manufactured by Larsen Manufacturing Co., Minneapolis, Minnesota or an approved equal.
- A. Recessed cabinets are to be Model 2409-R2, 24"x9-1/2"x6" inside box dimension recessed with 5/16" flat trim with vertical duo door. (25"x10-1/2"x6-1/4" rough opening)
 - B. Recessed cabinets in fire rated partitions are to be Model FS-2409-R2, 24"x9-1/2"x6" inside box dimension recessed with 5/16" flat trim with vertical duo door. (26-1/8"x11-5/8"x7-1/8" rough opening)
 - C. Semi-recessed cabinets are to be Model 2409-6R, 24"x9-1/2"x6" inside box dimension with vertical duo door. (25"x10-1/2"x4" rough opening)
 - D. Semi-recessed cabinets in fire rated partitions are to be Model FS-2409-6R, 24"x9-1/2"x6" inside box dimension with vertical duo door. (26-1/8"x11-5/8"x4-7/8" rough opening)
 - B. Surface mounted cabinets are to be Model 2409-SM, 27 1/2"x13"x6" inside box dimension with vertical duo door.
- 2.02 Door and trim are to be one piece construction with 18 gauge steel box, baked on enamel finish to be white. Door to be mounted to frame with continuous piano hinge, rubber roller catch, stainless steel glass clips, laminated safety glass and chrome-plated hardware. Provide a recessed handle.
- 2.03 Fire extinguishers (one per cabinet) shall be multi-purpose dry chemical extinguishers, Model No. MP-5A with UL rating 3A-40 B:C in accordance with Underwriters Standard 299.

PART 3 - EXECUTION

- 3.01 **INSTALLATION:** Fasten and secure in conformance with the recommendations of the manufacturer. Install cabinets with extinguishers in accordance with, and where required by, the state building code and state accessibility code.

END OF SECTION

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SECTION 10 51 14

PERSONAL STORAGE LOCKERS WITH BUILT-IN BENCH DRAWER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Personal Storage Lockers with built-in bench drawers
 - 2. All lockers include factory installed electrical receptacles.

1.3 REFERENCES

- A. American National Standards Institute (ANSI) Standards:
 - 1. Applicable standards for fasteners used for assembly.
- B. American Society for Testing and Materials (ASTM) Standards:
 - 1. Applicable standards for steel sheet materials used for fabrication
 - 2. Applicable standards for the testing of electrostatically applied Powder Coat Paint
- C. American Institute Of Steel Construction (AISC) Standards:
 - 1. Applicable standards for steel materials used for fabrication.

1.4 DESCRIPTION

- A. General: Welded Metal Lockers. Specialized lances to provide the flexibility of on-site, end-user reconfiguration/addition of internal components anytime, anywhere, in the future.
- B. Finishes: Fabricated Metal Components and Assemblies: All components to be painted with an electro-statically applied Powder Coat paint that can meet or exceed test requirements set out by ASTM standard D3451-06 Standard Guide for Testing Coating Powders and Powder Coatings.

1.5 PERFORMANCE REQUIREMENTS

- A. Conform to all applicable Federal, State and local codes and laws.

1.6 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's product literature and installation instructions for each type of welded metal locker required. Include data substantiating that products to be furnished comply with requirements of the contract documents.
- C. Shop Drawings: Show fabrication, assembly, and installation details, including descriptions of procedures and diagrams. Show complete locker installation layout, including quantities, locations and types of accessory units required. Include notations and descriptions of all installation items and components.
- D. Provide layout, dimensions, and identification of each unit, corresponding to sequence of installation procedures.
- E. Samples: Provide minimum 3 inches square example of each color and texture on actual substrate for each component to remain exposed after installation.
- F. Selection Samples: For initial selection of colors and textures, submit manufacturer's color charts, consisting of actual product pieces, showing full range of colors and textures available.
- G. Warranty: Submit copy of proposed warranty.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Engage an experienced manufacturer who is ISO 9001 certified for the design, production, installation and service of welded metal lockers.
- B. Installer Qualifications: Engage an experienced installer who is the manufacturer's authorized representative for the specified products for installing welded metal lockers.
 - 1. Minimum Qualifications: 3 year experience installing welded metal lockers of comparable size and complexity to specified project requirements.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
- B. Follow manufacturer's instructions and recommendations for delivery, storage and handling requirements.

1.9 PROJECT CONDITIONS

- A. Field Measurements: Verify quantities of welded metal locker units before fabrication. Indicate verified measurements on shop drawings. Coordinate fabrication and delivery to ensure no delay in progress of the work.

- B. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating welded metal lockers units without field measurements. Coordinate construction to ensure actual dimensions correspond to established dimensions.

1.10 SEQUENCING AND SCHEDULING

- A. Sequence welded metal lockers to minimize possibility of damage and soiling, during remainder of construction period.
- B. Schedule installation of specified welded metal lockers after finishing operations, including painting, have been completed.
- C. Pre-installation Conference: Schedule and conduct conference on project site to review methods and procedures for installing welded Metal Lockers.

1.11 WARRANTY

- A. Provide a written warranty, executed by Design/Builder, Installer, and Manufacturer, agreeing to repair or replace units, which fail in materials or workmanship within the established warranty period.
- B. Limited Lifetime Warranty: Subject to the terms in the written warranty, warrant the original purchaser exclusively that the locker frames manufactured by it will be free from defects in materials and workmanship for the lifetime of the locker.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Spacesaver Corporation, 1450 Janesville Avenue, Fort Atkinson, Wisconsin 53538-2798. Telephone: 800-492-3434.

Model: FreeStyle™ Personal Storage with built-in bench drawers and double doors
- B. Substitutions: Under provisions of Section 01 60 00.

2.2 BASIC MATERIALS

- A. Provide materials and quality of workmanship, which meets or exceeds established industry standards for products specified. Use furniture grade sheet metal, solid hardwood benches and fasteners for component fabrication unless indicated otherwise.
 - 1. Lockers to be equipped with environmental ventilation functionality for future installation of a Mechanical Air Extraction system.
 - 2. Lockers to be equipped with the functionality of attaching a modular electrical system.

2.3 MANUFACTURED COMPONENTS

A. Welded Frame:

1. The welded frame must consist of top, bottom, back, and sides constructed of a minimum of 18-gauge steel. All frame components shall be joined using resistance welding. Riveting of structural members will not be permitted.
2. Horizontal front flanges will be a minimum of 2 inches. Vertical front flanges will be a minimum of 1 inch. Horizontal and vertical flanges will overlap and be secured with a minimum two (2) resistance welds per corner.
3. Corner gussets shall be MIG and spot welded in each of the four front corners of the locker for increased stiffness and rigidity.
4. Provide side panel lances evenly spaced on 3 inch centers. Lances to provide the flexibility of on-site, end-user reconfiguration/addition of internal components anytime, anywhere, now or in the future.
5. Bench Housing for built-in bench drawer
 - a. Welded frame construction shall consist of top, bottom, and side components joined by using resistance welding. Riveting of bench housing structural members will not be permitted.
 - b. Corner gussets shall be welded in the two (2) front bottom corners of the bench housing for increased stiffness and rigidity.
 - c. Horizontal front flanges will be a minimum of 1 inch
 - d. Vertical front flanges will be a minimum of 1 inch
 - e. Horizontal and Vertical front flanges will overlap and shall be secured with minimum of one (1) resistance weld per corner.
 - f. Side panels – Lances symmetric and evenly spaced to provide optimum component locations (standard based on 3 inch on center vertical placement to match mating locker lance design).
 - g. Return flanges on housing to securely fasten housing to welded frame of locker.
 - h. Base of bench housing shall include four (4) 3/8"-16 UNC threaded weld-nuts and corresponding leveling feet.
 - i. Top of bench housing shall include hole pattern for mating bench seat.
 - j. Sides of bench housing shall include mounting holes in the event lockers are ganged together.
6. Lockers with built-in bench drawer shall have intermediate base shelf with interlocking mechanism for securing drawer when locker door is closed.
7. Provide four (4) 0.875 inch diameter duplex electrical knock-outs per locker, two (2) located on top of the locker in both right and left rear corners, and two (2) located in the back of locker centered at a distance no greater than 24 inches from the top and bottom.
8. Provide ventilation holes in top of locker to allow mechanically extracted air to be pulled up through the locker system. Ventilation shall be controlled by eight (8) evenly spaced 0.625 inch diameter holes.

9. Lockers shall be prepared with mounting holes for use with the continuous sloped top system.
 10. Lockers shall be prepared with mounting holes for attaching necessary trim components
 11. Locker shall be prepared with mounting holes for ganging lockers back-to-back or side-by-side
 12. Base of lockers shall include four (4) 3/8"-16 UNC threaded weld-nuts and corresponding leveling feet.
 13. Base shelf for lockers with built-in bench drawers shall have holes to accommodate double-door lock rod and door stop bracket.
 14. Panels with no exposed fasteners shall be provided on the end of each locker run; thus providing a clean and aesthetically pleasing appearance.
 15. Size of lockers:
 - a. Width: 30 inches
 - b. Height: 84 inches
 - c. Depth:
 - 1) Upper portion of lockers: 24 inches
 - 2) Bench drawers: 36 inches, Bench seat depth 13.0 inches,
Leading edge of bench seat to extend 1.125 inches from front of bench drawer.
 2. Built-in bench drawer nominal height is 18 inches.
- B. Ventilation:
1. Provide ventilation holes in top of locker as noted above.
 2. Provide an adjustable air baffle for system balancing. Upon balancing system, air baffle shall be secured with a fastener to maintain ventilation setting.
 3. Provide louvered air vents in bottom of the main locker doors to allow proper air movement.
 4. Provide louvered air vents in drawer front.
 5. Minimum 0.500 inch gap between back of shelving components and back of locker to provide uninterrupted air flow up the rear of the locker system.
 6. Minimum 2.00 inches gap between front of shelving and locker door to provide uninterrupted air flow up the front of the locker system.
- C. Electrical
1. Provide a minimum of two (2) duplex electrical receptacles per locker, one at top location and one at bottom location.
 2. Provide and install UL Listed manufacturer-installed electrical wiring system. This manufactured electrical wiring system provides connection for a maximum of 78 receptacles per hardwired power in-feed (Note: total number of receptacles is dependent on load requirements). This manufactured electrical wiring system provides electrical

capability to the lockers. Coordinate connection with building's power. See electrical drawings.

D. Drawers:

1. Drawer body wrapper shall have welded frame construction. Riveting of structural members will not be permitted.
2. Drawers for locker with built-in bench drawers shall have box-formed drawer front.
3. Provide interlock system for securing drawer when main locker doors are closed and provide access only when main locker doors are opened.
4. Built-in bench drawer shall have a nominal 36 inches depth.
5. Provide a flush mounted pull handle.
6. Drawer Slides: Provide 200 lbs maximum load capacity and pass 50,000 cycle performance testing (Max. load, uniform distribution) (Test data to be provided by manufacturer)
7. Bench drawer minimum 26.5 inches drawer extension

E. Bench Seat:

1. Provide laminated kiln dried maple bench seat; material thickness 1.25 inches
2. Front (leading edge) of bench seat to have .625 inch radius bull nose.
3. Finish of bench seat shall be sanded smooth and have two (2) coats of catalyzed varnish applied.

F. Single-Piece Welded Doors:

1. Shall be formed from two (2) pieces of minimum 18-gauge cold rolled steel box formed and welded together using modern GMAW techniques. Single-piece door with inner and outer door panels shall have a combined steel thickness of no less than 0.096 inches thick. Welded door design with inner panel optimizes structural integrity of locker door system over and above any single frame door design.
2. Exterior door panel shall be constructed with formed flanges and return flanges to add stiffness.
3. Internal door panel shall be constructed with formed flanges for added stiffness.
4. Inner door panel heights shall be minimum 70% of external door height.
5. Inner door panel to have peg board style hole pattern, for accessories.
6. Inner door panel to have 4 inch rectangular slot centered towards the top of the locker.
7. External door panel shall have louvers to provide adequate air circulation throughout locker system.
 - a. Louvered air vents shall be located at the bottom of the locker door to enhance circulation of mechanically extracted air from the bottom of the locker out of the top.
 - b. Louvered air vents shall be approximately 3 inches in width and 0.75 inches in height and spaced on 1 inch centers.

8. Double door designs shall consist of the following:
 - a. Primary door located on the right and the secondary door located on the left-hand side of the locker.
 - b. Secondary door locking mechanism shall consist of the following:
 - 1) Return flange for supporting primary door
 - 2) Catch bracket
 - 3) One lower lock rod
9. All doors shall have neoprene silencers on each door for noise reduction
10. Hinge:
 - a. Provide 16-gauge full length hinge for increased strength and security of locker system.
 - b. Hinges to be welded to door frame with spot welds not to exceed 6 inch separation.
11. Door assembly to be riveted to door frame on factory pre-established hole pattern.
12. Locking Mechanism.
 - a. Provide three locking options (all locking options have protective stainless steel cover plate for durability and scratch resistance):
 - 1) Keyed lock with master and padlock hasp.
 - b. Keyed locking mechanisms shall NOT have the capability of locking automatically. Operator must use a key to lock the locker.
 - c. Keyed locking mechanisms shall have master key override.
 - d. Double door models: Provide three locking options on the primary door and simple secure lift latch mechanism with 0.3125 inch lock rod for secondary door.
- G. Interior/Accessory components:
 1. All interior components must be constructed of minimum 18-gauge steel.
 2. Shelves
 - a. Shelf with integral hanger bracket
 - 1) Size specified by locker width
 - 2) Hanger bracket designed with perforations on approximately 3 inch centers to insure clothing separation for optimum ventilation
 - 3) Performance: Uniform load rating 300 lbs
 - b. Shelf rear return flange stops minimum 0.50 inch short of locker back panel on order to allow air circulation throughout entire locker assembly
 - c. All performance test data shall be provided by manufacturer upon request.
 3. Modular Shelf
 - a. Provides storage compartment for smaller items
 - b. Approximate compartment size: 9 inches wide and 12 inches high

- c. Modular shelves to have tabs to interlock with frame side panel lances
 - d. Modular shelves vertical sides to have lances that match with opposing side panel lances.
 - e. Modular shelves shall have two (2) locations on vertical side panel for attaching hooks, and one (1) location on bottom for attaching double hook accessories.
 - f. Shelf rear return flange stops approximately 1 inch short of locker back panel on order to allow air circulation throughout modular shelf.
- 4. Provide one lockable compartment for small valuables
 - a. Lockable compartment shall be integral to modular shelf accessory
 - b. Provide a 14-gauge padlock-able compartment door.
 - c. Provide 0.188 inch diameter zinc plated steel hinge rod.
 - d. Door to be mounted with zinc plated steel hinge rod and two shoulder washers for smooth, quiet operation.
 - e. Provide an 18-gauge hasp bracket for securing lockable compartment door.
- 5. Adjustable Shelf
 - a. Integral with modular shelf
 - b. Shelf to have tabs to interlock with frame side panel and modular shelf lances.
 - c. Shelf shall contain slots for file divider accessories as previously defined
- 6. Boot Tray
 - a. Material – Rubber
 - b. Dimensions: 1.9” w x 19.9” deep x 1.25” high
 - c. Manufactured from Natural rubber compounds, environmentally friendly, durable, water repellant easily cleaned with soap and water, resistant to alkalis and weak acids, mold, mildew, and dust mites.
- 7. Body Armor Drying Rack
 - a. Provide one body armor drying rack in each locker.
 - b. Bottom of drying tray shall have louvered pattern to provide air circulation throughout
 - c. Shall have the ability to adjust/glide frontward and backward, while mounted in the bench drawer.
- 8. Internal Drawer
 - a. Provide one full width internal drawer.
 - b. Drawer shall have a depth of approximately 19 inches and a 6 inch height.
 - c. Drawer shall not have a lock.
 - d. Drawer shall have a tested weight capacity rating of 50 lbs.

9. UWR™ Universal Base and Support Rail
 - a. Shall be capable of using standard Spacesaver stock cups and barrel supports for weapons storage within the locker. Provide all components required to secure an A4/M4 assault rifle to the interior of the locker.
10. Hooks
 - a. Single Hooks – shall have the ability to attach single hooks on the side of the Modular Shelf and on the side panel lances.
Provide minimum one single hook on both sides of locker.
 - b. Double Hook – shall have the ability to attach a double hook to the underside of the Modular Shelf.
Provide one double hook per locker.
- H. Electrical system – provide the following:
 1. UL listed manufactured electrical wiring system with plug-in-play component design
 2. Receptacles – standard 20 amp duplex receptacles and 20 amp GFCI duplex receptacles
- I. HVAC
 1. All lockers are to be equipped with mechanical air extraction capabilities and adjustable air balancing capabilities. A mechanical ventilation system may be installed in the future.
 2. Manufacturer is to provide locker system HVAC guidelines and recommendations to aid in overall locker and building system integration.
- J. Locker Tag Numbers
 1. Provide locker numbers on each locker. Owner will provide number sequence.
- K. ACCESSORIES:
 1. Lockers will be installed on a concrete base.
 2. Provide Trim and Fillers as necessary: Provide manufacturer's standard.]

2.4 FINISHES

- A. Colors: Selected by Owner from manufacturer's standard available colors.
- B. Paint Finish: Textured – Provide factory applied electrostatic powder coat paint. Meet or exceed specifications of the American Society for Testing and Materials (ASTM) Standards:

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine Lockers scheduled to receive accessories [with Installer present] for compliance with requirements for installation tolerances and other conditions affecting performance of specified accessory items.

- B. Proceed with accessory installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Follow manufacturer's written instructions for installation of lockers and each type of accessory item specified.

3.3 FIELD QUALITY CONTROL

- A. Verify accessory unit alignment and plumb after installation. Correct if required, following manufacturer's instructions.
- B. Remove components that are chipped, scratched, or otherwise damaged and which do not match adjoining work. Replace with new matching units, installed as specified and in manner to eliminate evidence of replacement.

3.4 ADJUSTING

- A. Adjust all accessories to provide smoothly operating, visually acceptable installation.

3.5 CLEANING

- A. Immediately upon completion of installation, clean components and surfaces. Remove surplus materials, rubbish and debris, resulting from installation, upon completion of work and leave areas of installation in neat, clean condition.
- B. Clean under provisions of Section 01 70 00.

3.6 DEMONSTRATION/TRAINING

- A. Schedule and conduct demonstration of installed accessory items and features with Owner's personnel.
- B. Schedule and conduct maintenance training with Owner's maintenance personnel. Training session should include lecture and demonstration of all maintenance and repair procedures that end-user personnel would normally perform.

3.7 PROTECTION

- A. Protect system against damage during remainder of construction period.
- B. Protect finished product and work under provisions of Section 01 70 00.

END OF SECTION

SECTION 11 98 12

DETENTION EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract and Division 1 Specification Sections, apply to this Section.

1.02 DETENTION WORK GENERAL DESCRIPTION

- A. Detention Contract: The successful bidder for this subcontract shall be referenced as the Detention Contractor (DC). This section includes the responsibilities for a single-source detention specialist for detention work.
- B. Components: Work of this Section will comprise:
 - 1. Detention Hollow Metal Doors & Frames
 - 2. Security Glass & Glazing
 - 3. Meal Passes, etc.

1.03 WORK INCLUDED

- A. Detention Contractor shall supply all labor, materials, parts, tools, services, equipment and components required to complete this section of the work, including miscellaneous hardware items, connectors, plugs, cables, brackets and other items not specified herein.
- B. Detention Contractor shall be responsible for the complete design, installation, troubleshooting, testing and commissioning of the system, and provide a properly installed, complete and operational system.
- C. Detention Ceiling – Painted metal deck ceilings are indicated elsewhere. Coordinate with the requirements of this and the work of other sections within the Detention area.
- D. Painting – Painting will be carried out under section 09 91 00. Provide information on any special provisions required by the work of this section.

1.04 SHOP DRAWINGS & SUBMITTALS

- A. Shop drawings: Submit in accordance with Division 1, Section 01 33 00 - Submittals.
- B. Prepare and provide detailed drawings of all components showing construction methods, type and gauge of material, hardware and fittings, and other components. Show how components or assemblies are installed or otherwise incorporated into the work of other trades. Show plans, sections, elevations and details as required to fully illustrate and explain the work, what is included in the work, and other

information required for the Consultant to understand the system, assemblies and integration into the work of other sections. Provide to appropriate trades, setting drawings and templates where required, showing anchorage and fixing as appropriate.

- C. Detention Door & Frame: Indicate each type of door, frame, steel core, material thickness, mortices, reinforcements, anchorages, locations of exposed fasteners, openings, and arrangement of hardware.
- D. Detention Hardware Schedule - Coordinate hardware items with doors, frames and related work to ensure proper size, thickness, orientation, handing, function and finish of hardware.
- G. Door & Frame Samples: Submit partial sample of doors showing corner detail, stiffeners, insulation, butt and strike pocket reinforcement and glazing details.

1.05 QUALITY ASSURANCE

- A. The manufacturer and installer's companies must have specialized in the products specified in this section with a minimum of 10 years documented experience.
- B. Manufacturers shall provide evidence of the following.
 - 1. The manufacturer shall submit proof of product liability insurance.
 - 2. UL437 is used to establish the quality, construction, and pick-resistance of pin tumbler cylinders. Manufacturer shall submit proof of compliance and listing under UL Standard 437 Key Locks.

1.06 TESTING

- A. Detention Door & Hardware Testing: Upon completion of installation and before project is turned over to Owner, the detention equipment manufacturer shall provide a representative to test each door. Each door shall be tested for correct installation and fit, keying, and finish. Upon completion of testing the manufacturer's representative shall turn over to the Owner a written account of each door with deficiencies noted. Notify the Owner at least three (3) days prior to inspection so arrangements can be made for Owner's representative to be present.
- B. Detention Door – Testing Requirements: Products shall be tested by an independent, nationally recognized agency in strict conformance with the test methodology of ANSI/NAAMM 863-90, Products meet each of the following NAAMM 863-90 performance criteria:
 - 1. Static Load Test - Under 6,300kg (14,000 lb) load, maximum mid-span deflection shall not exceed 15mm (.58") and after release of load, shall not exceed 0.025mm (0.10").
 - 2. Rack Test - Under 3,375kg (7,500lb) corner load, maximum deflection shall not exceed 100mm (3.5") and there shall be no buckling or failure of welds.
 - 3. Impact Load Test - After 400 impacts of 890N (200 ft-lb) the door shall remain secure, without undue buckling or bending, or other damage that would adversely affect the door's performance or security.
 - 4. Removable Glazing Stop Test - After 400 impacts of 890N (200 ft-lbs) each removable glass stop and steel plate shall remain firmly in place so that removal cannot be accomplished without removing the glazing screws and there shall be no more than one (1) broken glazing screw in the assembly.
 - 5. Product shall be manufactured by a firm experienced in the design and production of custom detention security door and frame assemblies and the integration of security hardware and glazing materials as they impact upon the scope of work.

1.07 WARRANTY

- A. Detention Contractor shall warrant the material and workmanship on this project for a period of one (1) year after acceptance by Owner as specified in Division 1, General Requirements, Detention Contractor agrees to repair or replace any defective detention materials or work given written notice during Warranty period.
- B. All detention security doors and frame products shall be warranted from defects in manufacture, materials, workmanship or assembly for a period on one (1) year from date of acceptance.
- C. Manufacturer of detention hardware shall warrant that replacement parts shall be available for locking mechanisms for a minimum of twenty (20) years from the date of purchase of original equipment.
- D. Preventive Maintenance: Detention Contractor to include in his bid without additional cost to the owner, one service and inspection trip during the 12 month warranty period. Equipment shall be inspected for function, adjustment and lubrication. Necessary adjustments and lubrication shall be made and a written account provided to the Owner.

1.08 PROJECT CONDITIONS

- A. Detention Contractor shall inspect the drawings, specifications and jobsite in the vicinity of the detention area for any actual or planned conditions that may affect the design, installation, performance or other aspects of the work of this section, and bring any potential adverse conditions to the attention of the Owner.

1.09 MAINTENANCE DATA

- A. Provide maintenance and cleaning instructions for all products and components provided under the work of this Section.
- B. Provide cleaning and re-installation instructions for security glazing products provided under the work of this Section.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Southern Folger Detention Equipment Company
- B. Substitutions: Under provisions of Section 01 60 00.

2.02 DETENTION HOLLOW METAL DOORS & FRAMES and DETENTION DOOR ASSEMBLIES

- A. Construction – Door (Maximum Security):
1. Doors shall be flush swing type, 2" thick of the sizes and configurations as indicated on the Drawings and Schedules.
 2. Face sheets shall be fabricated from stretcher leveled 14 gauge sheets, and shall be continuously welded together the full height of the door, ground smooth with no visible seams.
 3. Formed edges shall be true and straight with a minimum radius for the thickness of steel used.
 4. Lock and hinge edges shall be beveled 1/8" in 2" unless security/builders hardware or door swing dictates otherwise.
 5. Lock and hinge edges shall be continuously reinforced with 12 gauge vertical formed steel stiffener, welded to the interior of both face sheets at 4" on center maximum.
 6. Door shall be internally reinforced with 18 gauge continuous vertical top hat steel stiffeners spaced with Interior webs no more than 4" apart, welded to each face sheet at 6" on center maximum. 'Top hat' stiffeners shall be secured together with UL approved RRPC adhesive, welded at top and bottom and continuously each side 12" from each end.
 7. Voids between stiffeners shall be filled with 1.5 pcf density, loose batt type fiberglass material.
 8. Top and bottom of door shall be reinforced with 12 gauge continuous inverted steel end channels, welded to each face sheet at 3" on center maximum and continuously welded to lock and hinge edge vertical formed steel stiffeners.
 9. Top and bottom of doors shall be provided with 12 gauge continuous flush steel non-removable end caps, continuously welded to face sheets at bevels.
- B. Construction – Frame (Maximum Security): Frames shall be of the types, sizes, and profiles as indicated on the schedules or details. Frames shall be fabricated from stretcher leveled 12 gauge steel.
1. Frames shall be constructed of commercial quality, cold-rolled steel conforming to ASTM A366/A366M, or hot rolled, pickled and oiled steel conforming to ASTM A569/A569M, or from commercial grade steel to ASTM A566M-88, galvanized to ASTM A527M-87, coating designation to ASTM A525M087, ZF75(A25), commercially known as 'Galvineal'. Steel shall be free of pitting, scale, coil breaks or other surface blemishes, and free of buckles, waves or any other defects.
 2. Frames shall be of the types, sizes, and profiles as indicated on the Owner's schedules or details. Frames shall be fabricated from stretcher leveled 12 gauge steel.
 3. Jambs, heads, mullions, sills and center rails shall be straight and uniform throughout their lengths.
 4. Frame product shall be assembled square, free of defects, warps or buckles.
 5. Corner joint faces shall be accurately mitered and tightly fitted with integral stops either mitered or butted, continuously welded on the inside of the profile.
 6. Butted joints at mullions, sills or center rails shall be completed accurately with faces and soffits fully welded.
- C. Materials:
1. Doors: Doors shall be constructed of commercial quality, level, cold-rolled steel conforming to ASTM A366/A366M, or hot rolled, pickled and oiled steel conforming to ASTM

- A569/A569M, or from commercial grade steel to ASTM A566M-88, galvanized to ASTM A527M-87, coating designation to ASTM A525M087, ZF75(A25), commercially known as 'Galvineal'. Steel shall be free of pitting, scale, coil breaks or other surface blemishes. Steel shall also be free of buckles, waves or any other defects caused by the use of improperly leveled sheets.
2. Door Core: Fiberglass - loose batt type, density 1.5pcf (mini), conforming to CSA A101-M83, Type 1A.
 3. Adhesive: Resin reinforced polychloroprene (RRPC), fire resistant, high viscosity or UL-approved equivalent.
 4. Primer: Rust-inhibitive touch-up only.
- D. Door & Frame Hardware Preparations:
1. Doors shall be factory blanked, reinforced, drilled and tapped for fully templated mortised hardware in accordance with the final approved schedule and templates provided by the hardware supplier.
 2. Hardware reinforcement gauge or thickness shall be in accordance with the hardware manufacturer's templates.
 3. Frame product shall be blanked, reinforced, drilled and tapped for fully templated mortised hardware in accordance with the final approved schedule and templates provided by the detention hardware supplier.
- E. Frame Anchorage - Frame product shall be provided with anchorage appropriate to floor and wall construction.
1. Frame product set in unit masonry shall be provided with 12 gauge corrugated T-strap type steel anchors. Anchor shall be designed to fill the inside of the jamb profile. Wall strap portion shall be 2"x 10" minimum. Frames up to 4'-8" in height shall be provided with two (2) anchors per jamb, plus one (1) for each additional 1'-6" of frame height or fraction thereof.
 2. Jambs of frame product set in previously placed masonry, concrete or structural steel shall be punched and dimpled to accept 0.375" diameter machine bolts. Such preparations shall be located not more than 6" from the top and bottom of each jamb, with intermediate preparations at 1'-6" on center maximum. Each preparation shall be reinforced with 12 gauge steel channel and strap type guides, securely welded to the inside of the jamb profile.
 3. Each door opening shall be provided with two (2) temporary steel jamb spreaders welded to the base of the jambs to maintain proper alignment during shipping and handling. Spreaders shall be removed by the contractor responsible for installation, prior to anchoring of frame product to floor.
 4. Each door opening shall be prepared for GJ-64 single stud door silencers, three (3) for single door openings, two (2) for double door openings. Silencers shall be shipped loose for installation by the Design/Builder, after finish painting.
- F. Glazed Doors:
1. Where noted, doors shall be prepared for glazing materials of the specified types, sizes and thickness.
 2. Glazed openings shall be reinforced with 12 gauge formed "Z" steel stiffeners welded to each face sheet at 5" on center maximum, in each corner, and shall form an integral permanent glazing stop with a minimum height of 3/4" for non-security glazing, 1" for security glazing, on the secure side of the door.

3. Removable 12 gauge formed steel "Z" stops shall be provided. Corners shall be fully welded forming a one-piece frame. Frame shall be secured with 1/4 - 20 button-head, tamper resistant machine screws at 6" on center maximum, 2 per stop minimum. Minimum stop height shall be 1".
- G. Meal Passes & Other Openings:
 1. Doors shall be constructed with provision for operable meal passes.
 2. Clear opening shall measure 12" in width and 4.5" in height minimum.
 3. Perimeter of opening shall be closed and reinforced with 10 gauge continuous steel inverted channel fully welded to each face sheet and ground smooth.
- H. Finishing:
 1. All tool marks, abrasions and surface blemishes shall be filled and sanded to present smooth and uniform surfaces. Remove weld slag and spatter from exposed surfaces.
 2. On exposed surfaces where zinc has been removed during fabrication, doors shall receive a factory applied touch-up primer. Primer shall be fully cured prior to shipment.
- I. Clearances & Tolerances: Edge clearances for swing doors shall not exceed the following:
 1. Between door and frame at head and jambs – 1/8"
 2. Between edges of pairs of doors – 1/8"
 3. At door sills where a threshold is used – 3/8"
 4. At door sills where no threshold is used – 3/4"

2.03 SECURITY GLASS & GLAZING

- A. Provide security glazing where noted.
- B. Materials: Structured plastic sheet or laminate with scratch-resistant finish.
 1. Lexan MR10 Sheet by GE Structured Products
 2. Lexgard Laminate Sheet by GE Structured Products
- C. Testing – Abrasion and Impact-Resistance:
 1. Product must meet Taber abrasion test: 100 cycles CS10F, ASTM D1044 Z26.1 with a percentage hazing of 4% or less.
 2. Product must comply with the requirements of Burglary-Resisting Glazing Materials according to UL Standard 972.
- D. Security glazing for cell doors shall consist of a minimum of two layers. The primary layer shall provide sufficient strength to meet the impact resistance specified. The secondary layer shall be installed to the detainee side for scratch resistance, and shall be designed to be easily and economically replaceable.
 1. Primary Layer – Lexan MR10 Sheet, or Lexgard laminate 1/2 inch thick.
 2. Secondary Layer – Lexan MR10 Sheet, 1/4" thick, installed to detainee side.
- E. Rabbets & Glazing Stops – Provide rabbet depth as recommended by the glazing manufacturer. Include allowance for thermal expansion and contraction.

- F. Gaskets – provide soft rubber, neoprene or closed-cell foam gaskets where required. Gaskets shall not be capable of being used as a ligature if removed by a detainee.
- G. Provide manufacturer’s recommended cleaning procedures and substances for regular cleaning, graffiti removal, and the removal or minimizing of hairline scratches.

2.04 MEAL PASSES

- A. Provide meal passes on cell doors.
- B. Meal pass shutter shall be constructed of 1/8” steel plate, complete with hinges and lock. The design and fabrication shall prevent tampering from the detainee side.

2.05 DETENTION HARDWARE

- A. Provide products of a single manufacturer, who complies with Part 1 of this Section.
Acceptable Manufacturers include: Southern Folger Detention Equipment Company, San Antonio, TX, (201)533-1231
- B. Locks & Keys – Provide keying schedule for approval.
 - 1. Each paracentric key lock will include five lever tumblers. Maximum clearance between tumbler gate and locking fence is .031 inches. Fit tumblers to allow for .025 inches of wear before replacement of key is required. Tumblers shall be spring temper bronze alloy C-26000 with a notched gate edge.
 - 2. Maxi-Mogul pin tumbler cylinder shall be two inch diameter brass with stainless steel balls, tumblers, and springs. Manufacturer shall provide written certification that keying is free from unwanted interchange and is not assigned to other institutions in close proximity. Cylinders to comply with UL437, and be labeled by a nationally recognized independent testing laboratory.
 - 3. Paracentric keys for lever tumbler locks are to be investment cast from silicone brass ASTM B30, with a hardness of 80 on the Rockwell B scale. Furnish six (6) keys for each combination. Furnish keys for up to (3) combinations.
 - 4. Mogul keys for pin tumbler locks are to be stamped from CDA-78200 hard-temper alloy, with a hardness of 85 on the Rockwell B scale. Furnish six (6) keys and change key combination.
 - 5. Stamp all keys as directed by the approved keying schedule.
- C. Materials - Materials shall be new, designed specifically for detention applications and bolted or welded together. Basic detention materials shall be steel plate or sheet as follows:
 - 1. Housings - 7 gauge
 - 2. Lock Mountings - 7 gauge
 - 3. Covers - 10 gauge
 - 4. Enclosed panels - 10 gauge
- F. Mechanical Lever Tumbler Locks - Lever tumbler locks shall operate with paracentric key. Key all lever tumbler locks into one keying system. Include lock mounting, escutcheons, strike and mounting screws for a complete application. Use Torx tamper resistant screws on lock mounting and strike.

Locks shall be Folger Adam 60K series maximum security latch and key operated deadlock with knob set, or approved equivalent.

1. Case - Malleable iron casting.
2. Cover - Cold finished steel, 3/8 inch thick.
3. Latchbolt - Cold finished steel, electro-galvanized, 1/2" thick with two 1/4" diameter hardened steel roller pins, 3/4" throw.
5. Cylinder - Investment cast, silicon brass alloy.
7. Operation - Unlocks with a half turn of the key. Deadlocks with a full turn of the key in the opposite direction. Latch operated by knob set unless deadlocked. Key removable in the locked and deadlocked positions.

G. Miscellaneous Door Hardware:

1. Folger Adam #2 Door pull or approved equivalent with two 3/8" Torx oval head tamper resistant screws. 8 5/8" long with 5 1/4" hand hold and 1 1/2" finger clearance to door. Material: Manganese bronze, with US26D finish.
3. Folger Adam 17M1 Latch for Hollow Metal Food Passes – case: malleable iron casting, cover: cold finished steel, 1/4" inch thick, latchbolt: brass casting, 7/16" throw, 190 Maxi-Mogul pin tumbler cylinder with Level 1 security.

2.06 HARDWARE REQUIREMENTS

A. Finishes: Hardware in General: US32D Satin Stainless Steel

B. Detention Hardware Schedule for door No. 032 at Cell 032.

1. One Prison Deadlock SS-1939 AD-1 (Paracentric cylinder & key)
2. One Door Pull SS 212C

C. Hinges - Provide three Folger Adam 4 1/2" FM-ICS institutional hinges (beveled tops) for detention hollow metal doors not larger than three foot wide by seven foot high (nominal dimensions). Supply one additional hinge for wider and taller doors. Double quantities for pairs of doors. Attach each hinge with eight number 12 flat head Torx tamper resistant screws.

1. Hinge leaves - Investment cast stainless steel, 3/16 inch thick by 4 1/2 inch high with integral cast stud.
2. Hinge pin - Stainless steel 9/16 Inch diameter with 3/8 inch diameter stainless ball and hardened steel races.
3. Hinges to be full mortise type with hospital tip, and have a fully concealed non-removable pin. Hinge pins held in place with set screws are not acceptable.
4. Design hinges to pass the HMMA-663-88 Guide Specifications for Detention Hollow Metal Doors and Frames.
5. Integral cast studs on both leaves shall Interlock with the hinge reinforcing to hold door closed in the event the screws are sheared off.
6. Food Pass Hinges - Provide two Folger Adam No. 3 detention hinges for each food pass door. Supply four 3/8" flat head security screws break-off head for attaching each hinge. Hinge leafs - malleable iron, 3/8" thick by 3" high. Hinge pin - 1/2 inch diameter steel, case hardened. Machine blind hole in female leaf for press - fit of hinge pin. Pin to be non-removable. Provide full surface hinges to swing 180 degrees.
7. Finish: hinges shall be primed for paint.

- D. Door Seals: Provide door seals for acoustic separation at all swing doors. All by Draft Seal, or approved equal.
 - 1. Weatherstrip - DS132 with neoprene sponge, by Draft Seal, or approved equal.
 - 2. Auto Door Bottom - DS434AR institutional heavy-duty unit by Draft Seal, or approved equal.
 - 3. Food Pass Doors: Silicone gasket self-adhesive seal DSS66 by Draft Seal, or approved equal.

2.07 MATERIALS

- A. Steel Plates, Sheets, Tubes, Bars & Rods:
 - 1. Mild Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
 - 2. Hot-Rolled Steel Sheet: ASTM A 569/A 569M.
 - 3. Cold-Rolled Steel Sheet: ASTM A 366/A 366M.
 - 4. Steel Tubing: ASTM A 501 or ASTM A 513, Type B, unless otherwise indicated.
 - 5. Homogeneous Tool-Resisting Steel Round Bars: ASTM A 627.
 - 6. Homogeneous Tool-Resisting Steel Flat Bars: ASTM A 629.
 - 7. Homogeneous Tool-Resisting Steel Round Rods: Fabricated from material with same chemical and physical properties as homogeneous tool-resisting steel round bars.
- B. Security Fasteners: Operable only by tools produced for use on specific type of fastener by fastener manufacturer or other licensed fabricator. Drive system type, head style, material, and protective coating as required for assembly, installation, and strength, and as follows:
 - 1. Drive System Types: Pinned Torx-Plus, pinned Torx, or pinned hex (Allen). Where possible consistent drive type shall be used throughout.
 - 2. Socket Flat Countersunk Head Fasteners: Heat-treated alloy steel, ASTM F 835 (ASTM F 835M). Stainless steel, ASTM F 879 (ASTM F 879M), Group 1 CW.
 - 3. Socket Button Head Fasteners: Heat-treated alloy steel, ASTM F 835 (ASTM F 835M). Stainless steel, ASTM F 879 (ASTM F 879M), Group 1 CW.
 - 4. Protective Coatings for Heat-Treated Alloy Steel: Zinc chromate, ASTM F 1135, Grade 3 or 4; for exterior applications and interior applications where indicated. Zinc phosphate with oil, ASTM F 1137, Grade I, or black oxide, unless otherwise indicated.
- C. Concealed Bolts: ASTM A 307, Grade A, unless otherwise indicated.
- D. Cast-in-Place Anchors in Concrete: Anchors of type indicated below, fabricated from corrosion-resistant materials capable of sustaining, without failure, a load equal to 4 times the load imposed, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine work in the field and coordinate work of this section with constructed or planned work of other sections. Check field drawing and dimensions critical to the proper installation of the work of this section.

- B. Ensure building openings are suitable for delivery of equipment, and will be suitable at time of delivery, and coordinate special requirements of this section with the Owner as necessary.

3.02 FABRICATION & FINISHES

- A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Coordinate dimensions and attachment methods of detention enclosures with those of adjoining construction to produce integrated assemblies with closely fitting joints and with edges and surfaces aligned.
- C. Shear and punch metals cleanly and accurately. Remove burrs.
- D. Form edges and corners to be free of sharp edges or rough areas. Fold back exposed edges of unsupported sheet metal to form a 1/2-inch wide hem on the concealed side, or ease edges to a radius of approximately 1/32 inch and support with concealed stiffeners.
- E. Form metal in maximum lengths to minimize joints. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- F. Weld corners and seams continuously to comply with referenced AWS standard and the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
 - 5. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- G. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads. Build in straps, plates, and brackets as needed to support and anchor fabricated items to adjoining construction. Reinforce formed-metal units as needed to attach and support other construction.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive hardware, security fasteners, and similar items.
- I. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
- J. Form exposed connections with hairline joints flush and smooth, using concealed fasteners where possible. Use exposed security fasteners of flat-head (countersunk) security screws. Locate joints where least conspicuous.

- K. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.
- L. Provide detention enclosures that allow for thermal movement resulting from changes in ambient and surface temperatures by preventing buckling, opening up of joints, overstressing of components, failure of connections, and other detrimental effects.

3.03 INSTALLATION

- A. Verify that detention work is installed and connected according to the Contract Documents.
- B. Install all components and assemblies in accordance with the best commercial standards, and in such a manner as to ensure safe, proper operation and ease of maintenance.
- C. Frame Product Installation Tolerances - Set frame product plumb, square, aligned, without twist at correct elevation.
 - 1. Plumbness tolerance, measured through a line from the intersecting corner of vertical members and the head, to the floor, shall be +/- .063".
 - 2. Squareness tolerance, measured through a line, 90 degrees from one jamb at the upper corner of the product, to the opposite jamb, shall be +/- .063".
 - 3. Alignment tolerance, measured on jambs, through a horizontal line parallel to the plane of the wall, shall be +/- .063".
 - 4. Twist tolerance, measured at face corners of jambs, on parallel lines perpendicular to the plane of the wall, shall be +/- .063".
- D. Frame Installation - Secure anchorages and connections to adjacent construction. Frame product shall be fully grouted in place.

3.04 DELIVERIES

- A. Deliver equipment to the site for installation only after successful in-plant inspection.
- B. Protect equipment from damage, interference and theft. Coordinate secure storage requirements with the Owner.
- C. Packing & Delivery – mark or tag each item for identification. Wrap and/or crate components and assemblies to prevent damage.
- D. Key Delivery – keys shall be delivered directly from the Detention Contractor or manufacturer to a person designated by the Owner, either in person or by registered delivery with return receipt requested.

3.05 FIELD QUALITY CONTROL

- A. On-site supervision of work under this section, including all subtrades, shall be the responsibility of the Detention Contractor, who shall co-ordinate with the Owner as necessary.
- B. Observe field welding of detention work and anchorages, and ensure compliance with specified methods and good industry practices.
- C. Verify that detention work is installed and connected according to the Contract Documents.
- D. Verify that electrical wiring installation complies with manufacturer's submittal and written installation requirements in Electrical.
- E. Inspect installed detention work to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.

3.06 TESTING AND APPROVALS

- A. Test and ensure that all components and assemblies are correct as specified, and are in working order prior to delivery on site.

3.07 DAMAGE PROTECTION & CLEANING

- A. Ensure that all property and services in the immediate areas of the installation are protected against damage or interference.
- B. Make good any damage done to property during installation or testing. Replace any equipment damaged during installation or testing by the System supplier by new undamaged equipment.

END OF SECTION

SECTION 12 21 13

ROLL-UP WINDOW SHADES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes: Manually operated, roll-up fabric window shades including mounting and operating hardware.

1.02 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
 - 1. List of proposed products and product data.
 - 2. Shop drawings showing window openings, dimensions, and attachment method.
 - 3. Samples of fabrics and metal finishes.
 - 4. Window Shade Schedule listing rooms, field verified window dimensions, quantities, type of shade, fabric, and color.
 - 5. Manufacturer's installation and maintenance instructions.

1.03 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum of five years documented experience.

1.04 REGULATORY REQUIREMENTS

- A. Conform to all applicable Federal, State and local codes and laws.
- B. Fabric must meet state fire retardant requirements.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
- B. Do not deliver window shades until building is enclosed and construction within spaces where shades will be installed is substantially complete.
- C. Deliver products in manufacturer's original, unopened, undamaged containers with labels intact.
- D. Label containers and shades according to Window Shade Schedule.

1.06 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on drawings. Any inconsistencies shall be reported to the Owner prior to installation.

1.07 WARRANTY

- A. Provide under provisions of Section 01 78 00: 5 years warranty against defects in materials and workmanship for clutch operating mechanism.

PARTS 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Draper, Inc.
 - 1. Model: Flexshade
- B. Substitutions: Under provisions of Section 01 60 00.

2.02 MANUALLY OPERATED WINDOW SHADES

- A. Type: Manually operated, vertical roll-up, fabric window shade with bead chain and clutch operating mechanism, mounting brackets, fasteners, and other components necessary for complete installation.
- B. Method of installation: Mounted inside of window opening and extending from head to sill and jamb to jamb.
- C. Operation: Bead chain and clutch operating mechanism allowing shade to stop when chain is released. Designed never to need adjustment or lubrication. Provide preset limit stops to prevent shade from being raised or lowered too far.
 - 1. Clutch mechanism: Fabricated from high carbon steel and molded fiberglass reinforced polyester or injected molded nylon.
 - 2. Control loop: nylon bead chain hanging at side of window. Color selected by Owner from manufacturer's standard colors.
 - 3. Chain location: Right hand side when facing window from interior.
- D. Shade size: As required for size of windows indicated on Drawings. Verify dimensions of windows at site prior to fabrication.
- E. Roller: Fabricated from extruded aluminum, galvanized steel, or enameled steel. Diameter, wall thickness, and material selected by manufacturer to accommodate shade type and size. Provide roller idler assembly of molded nylon and zinc-plated steel pin. Provide sliding pin to allow easy installation and removal of roller.

- F. Brackets: Plated stamped steel suitable for mounting to wall or jamb. Provide size compatible with roller size and with fasteners appropriate for installation conditions. Provide bracket covers.
- G. Provide 3 7/8" fascia with associated endcaps. Color as selected by Owner from manufacturer's standard colors.
- H. Shade slat: Minimum 1/8 by 1 inch aluminum slat encased in heat seamed hem.

2.03 FABRIC

- A. Material: SheerWeave Series SW2400, SW2900 or SW2600 as selected by Owner. Meets NFPA 701 fire rating.
 - 1. PVC coated fiberglass, woven into a full. 35% fiberglass, 65% vinyl on fiberglass. Series models indicate openness 3%, 5% and 10% respectively. Average 11.25 oz./ sq. yd., .017" thick.
- B. Color: As selected by Owner from manufacturer's standard colors.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Field verify window dimensions prior to fabrication.
- B. Coordinate requirements for blocking and structural supports to ensure adequate means for installation of window shades.

3.02 INSTALLATION

- A. Install window shades at locations indicated in window shade schedule and approved shop drawings.
- B. Install in accordance with shade manufacturer's written instructions and approved shop drawings.

3.03 ADJUSTING AND CLEANING

- A. Operate shade through complete cycle of lowering, stopping, and rising to ensure proper operation. Adjust as required for smooth operation.
- B. Clean shade assemblies and protect from damage from construction operations. If damage occurs, remove and replace damaged components or entire unit as required to provide units in their original, undamaged condition.
- C. Clean under provisions of Section 01 70 00.

3.04 PROTECTION OF FINISHED WORK

- A. Protect finished product and work under provisions of Section 01 70 00.

3.05 WINDOW SHADE SCHEDULE

- A. Provide shades full height on all exterior windows throughout building except in Corridor and stairways.

END OF SECTION

SECTION 12 32 16

PLASTIC LAMINATE CASEWORK

PART 1 - GENERAL

1.01 SUMMARY

- A. Related Documents:
The Drawings and general provisions of the Contract and Division 1 Requirements, apply to the work in this Section.

1.02 SECTION INCLUDES

- A. Provide and install all plastic laminate casework and accessory items as specified herein.

1.03 RELATED SECTIONS

- A. Section 06 20 10 – Carpentry and Millwork
- B. Section 09 65 00 - Resilient Flooring

1.04 SUBMITTALS

- A. Submit product data, design data and test reports under provisions of Section 01 33 00.
- B. Submit shop drawings indicating materials, dimensions, cabinet-cut details, and sink locations.
- C. Samples of colors shall be submitted for selection and coordination with other suppliers. Owner may request and retain samples and catalog cuts as required for accessory and special items.
- D. Full-sized sample of base cabinet with door and drawer is to be submitted for review and retained until completion of job for verification and compliance of specifications.

1.05 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
- B. Installer: Company specializing in performing the work of this section with minimum five years documented experience approved by the manufacturer.

1.06 REGULATORY REQUIREMENTS

- A. Conform to all local, state, and federal codes.
- B. Conform to the State Building Code requirements for accessibility. The following special requirements shall be met.
 - 1. Countertop height: With or without cabinet below, not to exceed a height of 34 inches A.F.F., (Above Finished Floor), at a surface depth of 24 inches.

2. Kneespace clearance: Shall be minimum 29 inches A.F.F. at apron, and 30 inches clear span width.
3. 12 inch deep shelving, adjustable or fixed: Not to exceed a range from 9 inches A.F.F. to 48 inches A.F.F.
4. Wardrobe cabinets: Shall be furnished with rod/shelf adjustable to 48 inches A.F.F. at a maximum 21 inch shelf depth.
5. Sink cabinet clearances: In addition to above, upper kneespace frontal depth shall be no less than 8 inches, and lower toe frontal depth shall be no less than 11 inches, at a point 9 inches A.F.F.
6. Provide a removable angled knee panel at all accessible sinks

1.07 PERFORMANCE REQUIREMENTS

- A. The cabinets shall meet certified product test data in accordance with ANSI A161.1-1980, NEMA LD3-2000, and general static load testing performed and certified by an independent testing agency, covering the following areas of product performance, with these minimum results:
 1. Base cabinet construction/racking test: 800 lbs.
 2. Cabinet front joint loading test: 425 lbs.
 3. Wall cabinet static load test: 2,000 lbs.
 4. Drawer front joint loading test: 600 lbs.
 5. Drawer construction/static load test: 750 lbs.
 6. Cabinet adjustable shelf support device/static load test: 300 lbs.
- B. Lamination System: Doors, finished end panels, and other decorative exterior laminate surfaces shall be laminated exterior with .030 inch high-pressure plastic laminate, and interior with .020 inch high-pressure cabinet liner. Lamination with hybrid P.V.A. Type III water resistant adhesive.
- C. Structural Cabinet Body: Cabinet backs shall be minimum 1/2 inch thick, inset from rear of body, and fully bound (dadoed) four sides. Provide 3/4 inch thick stiffeners fastened to back/body as specified herein. Back perimeter shall be toe-nailed with mechanical fasteners for tight interior fitment and direct connection of back panel to body, and sealed with full-perimeter high-strength hot-melt adhesive.
- D. Interior Structure: All cabinets over 36 inches wide shall be furnished with a mechanically fastened, yet removable, vertical divider to reduce horizontal member/shelf deflection. Wall cabinets shall have a clear inside nominal depth of 12 inches unless detailed otherwise.
- E. Shelf Loading: Shelves shall meet the loading/deflection standards of the National Particleboard Association.
- F. Structural Drawer Body: Drawer body shall be doweled with 1/2 inch typical bottom, recessed, fully bound (dadoed) and joint-glued all four sides. Provide under body stiffeners as specified herein.
- G. Structural Cabinet Support: Cabinet sub-base shall be of a separate and continuous ladder-type platform design, leveled and floor mounted prior to cabinet body placement. Material shall be exterior grade plywood. No cabinet sides-to-floor will be allowed.
- H. Quality Standard: Comply with the requirements for modular cabinets in AWI's "Architectural Woodwork Quality Standards."

1. Provide AWI Quality Certification Program labels and certificate indicating that manufactured wood casework complies with requirements.

I. Formaldehyde binders are not allowed.

J. All adhesives are to be low VOC.

1.08 DELIVERY, STORAGE HANDLING

A. Deliver, store, protect and handle products at and to site under provisions of Section 01 60 00.

B. Casework shall be protected in transit. Store under cover in a ventilated building not exposed to weather or extreme temperature and humidity changes. Do not store or install casework in building until concrete, masonry, and drywall/plaster work is dry.

1.09 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on the shop drawings prior to fabrication.

1.10 COORDINATION

A. Coordinate work of this Section with related work of other Sections as necessary to obtain proper installation of all items under provisions of Section 01 31 00.

1.11 WARRANTY

A. Provide warranty under provisions of Section 01 78 00.

B. All materials shall be guaranteed for a period of 5 years from manufacturer's defects and workmanship.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Subject to compliance with requirements of this Specification Section, provide products listed herein from one of the following:

1. Case Systems
2. LSI Corporation of America, Inc. a division of Stevens Industries
3. Product custom manufactured to the specifications noted herein.

B. Basis of Design: LSI Corporation of America, Inc. a division of Stevens Industries

C. Substitutions: Under provisions of Section 01 60 00.

2.02 MATERIALS

A. Laminated Plastics/Finishes:

1. High-pressure plastic laminate, .030 inch in thickness, for exterior surfaces shall meet NEMA LD3-2000 VGL standards including thickness.

2. High-pressure plastic laminate color Selection Available:
 - a. Standard finish from casework manufacturer's standard stock colors. Minimum of 200 selections available.
 - b. Unlimited number of different colors and patterns allowed per project. Number of colors and patterns to be determined by Owner.
 3. Plastic Laminate Balancing Sheet: White high-pressure cabinet-liner, .020 inch in thickness shall meet NEMA LD3-2000 CLS standards. Use for balancing exterior surface laminates.
 4. Countertop High-Pressure Plastic Laminate:
 - a. High-pressure plastic laminate, .050 inch thickness Color as selected from manufacturer's stock standard patterns and solid colors.
 - b. Heavy gauge neutral colored backing sheet for balanced construction.
 5. Pressure Fused Laminate:
 - a. Melamine resin impregnated, 120 gram PSM minimum, thermofused to core under pressure.
 - b. Shall meet NEMA LD3-2000 VGL standards and NEMA LD3-2000 CLS standards.
 - c. White pressure fused laminate for cabinet interiors behind door and drawers, and underside of wall cabinets.
The interiors of all open cabinets and behind glass doors are to be finished with .030 inch high-pressure plastic laminate. Color selected by Owner from manufacturer's standard colors.
 - d. Shall be balanced at all concealed surfaces with same thermofused melamine. Unsurfaced coreboard or simple backers not allowed.
- B. Core:
1. Particleboard to be of 47 lb. density, and balanced 3-ply construction with moisture content not to exceed 8%. Particle board shall conform to ANSI A208.1-1993, type M-3.
 2. Cabinet components shall be of the following minimum core thicknesses:
 - a. 1/2 inch: cabinet backs, drawer body, and drawer bottoms.
 - b. 3/4 inch: door and drawer face, base, wall, and tall cabinet tops and bottoms, cabinet sides, drawer spreaders, cabinet back rear hangstrips, structural dividers, exposed cabinet backs, and shelves in cabinets.
 - c. 1 inch: product-specific work surfaces.
- C. Edging types:
1. FlatEdge PVC. .020 inch. Solid, high-impact, purified, color-thru, acid resistant PVC edging machine-applied with hot melt adhesives, automatically trimmed face, back and corners for uniform appearance. Manufacturer's option of .030 inch high-pressure plastic laminate if PVC match is unavailable.
 2. 3 mm thick PVC. Solid, high-impact, purified, color-thru, acid resistant, pre-lamination primed edging, machine-applied with hot melt adhesives, automatically trimmed, inside/outside length-radiused for uniform appearance, buffed and corner-radiused for consistent design.
- D. Edging Locations. Provide the above specified edging types at the following locations.

1. Door/Drawer-Front edging: 3mm PVC
Color and pattern of PVC is to match the color and pattern of the adjacent plastic laminate casework doors and drawers. Submit sample to be approved by Owner.
 2. Cabinet body edge, including door/drawer front spacer rail: FlatEdge PVC. Color selected from standard colors.
 3. Forward edge of interior body components, interior dividers, shelf, and top edges of drawer body: FlatEdge PVC to match cabinet interior surface color.
- E. Hardware
1. Hinges:
 - a. Heavy duty, five knuckle 2 3/4 inch institutional type hinge shall meet ANSI/BHMA A156.9 Grade 1 requirements. Mill ground, hospital tip, Teflon coated tight pin feature with all edges eased. Hinge shall be full wrap around type .095 inch thick steel. Each hinge shall have minimum of 9 screws, #7, 5/8 inch FHMS to assure positive door attachment.
 - b. Finish shall be LH-301 ChromeCoat Powder Finish, LH-302 Black, LH-303 White, LH-304 Dove Grey, LH-305 Haze, or LH-306 Light Beige epoxy coated.
 - c. One pair per door to 48 inch height, One and one-half pair over 48 inches in height. Hinge shall accommodate 13/16" thick laminated door and allow 270 degree swing.
 2. Pulls:
 - a. Stainless steel wire pull. 4" wide, 5/16" diameter, brushed or satin finish.
 3. Drawer Slides:
 - a. Drawers up to 24" wide:
Knappe & Vogt model 8417 (or equal), full extension, self-closing design, ball bearing, epoxy powder coated white finish.
Minimum 100 lb dynamic load rating at 50,000 cycles.
Drawers 24" to 36" wide and file drawers:
Provide Knappe & Vogt model 8500 (or equal), heavy duty, full extension, hold-in anti-rebound, ball bearing, anochrome finish.
Minimum 150 lb dynamic load rating at 50,000 cycles.
 - b. Provide body mounted molded rails for hanging file system for legal or letter size as indicated by manufacturer's model number. Cutting or machining of drawer body/face not allowed.
 4. Catches: Catch shall provide opening resistance in compliance with the Americans with Disabilities Act.
 - a. Provide top-mounted magnetic catch at each base and wall cabinet door.
 - b. Provide two magnetic catches at each tall cabinet door.
 - c. Provide one magnetic catch on both leafs of double door base and wall cabinets.
 - d. Catch housing shall be molded in White. LH-340ADA.
 5. Adjustable Shelf Supports: Shall be LH-354 twin pin design with anti tip-up shelf restraints for both 3/4 inch and 1 inch shelves. Design shall include keel to retard shelf slide-off, and slot for ability to mechanically attach shelf to clip. Load rating shall be

- minimum 300 lbs. each support without failure. Cabinet interior sides shall be flush, without shelf system permanent projection.
6. Locks: Shall be disc tumbler lock keyed alike per room and master keyed. Dull chrome finish.
- a. Hinged doors and drawers National Lock No. M4-7054.
 - b. Provide a lock on all doors and drawers in locations as directed by Owner. For bid purposes, provide 20 locks in each building.

G. Detailed Requirements For Cabinet Construction:

1. Sub-Base:
 - a. Cabinet sub-base shall be separate and continuous (no cabinet body sides-to-floor), water resistant exterior grade plywood with concealed fastening to cabinet bottom. Ladder-type jobsite construction of individual front, back, and intermediates, are to form a secure and level platform to which cabinets attach.
 - b. Sub-base at exposed cabinet end panels shall be recessed 1/4 inch from face of finished end, for flush installation of finished base material by other trades.
2. Cabinet Top and Bottom:
 - a. Solid sub-top shall be furnished for all base and tall cabinets.
 - b. At cabinets over 36 inches, bottoms and tops shall be mechanically joined by a fixed divider.
 - c. Exterior exposed wall cabinet bottoms shall be Pressure Fused white laminate both sides. Assembly devices shall be concealed on bottom side of wall cabinets.
3. Cabinet Ends:
 - a. Holes drilled for adjustable shelves 1 1/4 inches on center.
 - b. Exposed exterior cabinet ends shall be laminated with high-pressure plastic laminate, balanced with high-pressure cabinet-liner interior surface.
4. Fixed and Adjustable Shelves:
 - a. Thickness shall be 3/4 inch.
 - b. All shelves are to be full depth of cabinet.
5. Cabinet Backs:
 - a. Cabinet back shall be fully bound (dadoed) into sides, top, and bottom, recessed 7/8 inch from cabinet rear. Rear, unexposed, side of back shall be toe-nailed to cabinet body with mechanical fasteners and solidified with a continuous bead of industrial grade hot melt adhesive.
 - b. Hang rails shall be located at rear of cabinet back and fastened to cabinet sides. Provide minimum of 2 at base, 2 at wall, and 3 at tall cabinets.
 - c. Exposed exterior backs shall be high-pressure plastic laminate balanced with high-pressure cabinet-liner.
6. Door and Drawer Fronts:
 - a. Laminated door and drawer fronts shall be 13/16 inch thick for all hinged and sliding doors. Drawer fronts and hinged doors shall overlay the cabinet body. Maintain a maximum 1/8 inch reveal between pairs of doors, between door and drawer front, or between multiple drawer fronts within the cabinet.

- b. Stile and Rail doors shall be 13/16 inch thick with full 1/4 inch plate glass. Available hinged or sliding. All exposed lite-opening edges shall be trimmed and glazed with extruded glazing bead.
 - 7. Drawers:
 - a. Drawer fronts shall be applied to separate drawer body component sub-front.
 - b. Drawer sides shall be doweled and glued to receive front and back, machine squared and held under pressure, to set.
 - c. Drawer bottom shall be fully bound (dadoed) into front, sides, and back. Routing, in drawer body for bottom, shall receive continuous glue. Reinforce drawer bottoms with 1/2 inch x 4 inch front-to-back intermediate underbody stiffeners, mechanically fastened. One at 24 inches, two at 36 inches, and over.
 - d. Paper storage drawers shall be fitted with full width hood at back.
 - 8. Vertical and Horizontal Dividers: One of the following as indicated by cabinet number:
 - a. Natural hardboard 1/4 inch thick, smooth both faces. Secured in cabinet with molded plastic clips.
 - b. Pressure Fused laminate 3/4 inch thickness. Sub-dividers secured in cabinet with molded plastic clips or dowels. Structural dividers in cabinets over 36 inches wide secured in cabinet with mechanical euro fasteners.
 - 9. Door/Drawer Front Rail: Provide minimum 3/4 inch x 6 inch x full width cabinet body rails immediately behind all door/drawer and multiple drawer horizontal joints to maintain exact body dimensions, close off reveal, and be locator for lock strikes.
- H. Workmanship:
- 1. All exposed exterior cabinet surfaces shall be .030 inch high-pressure laminate, color as selected from casework manufacturer's standards. Laminate surface/balancing liner to core under controlled conditions by approved and regulated laminating methods to assure a premium lamination. Natural-setting hybrid P.V.A. Type III water resistant adhesives that cure through chemical reaction, containing no health or environmentally hazardous ingredients, are required. Methods requiring heat are not allowed; "contact" methods of laminating are not allowed.
 - 2. Cabinet parts shall be accurately machined and bored for premium grade quality joinery construction utilizing automatic machinery to insure consistent sizing of modular components. End panels shall be doweled to receive bottom and top.
 - 3. Back panel shall be fully bound (dadoed) into, and recessed 7/8 inch from the back of cabinet sides, top, and bottom to insure rigidity and a fully closed cabinet. Cabinet back shall be mechanically fastened from rear of body for tight interior fit and sealed with full-perimeter high-strength hot-melt adhesive.
 - 4. Drawer bottom shall be fully bound (dadoed) and glued into and recessed 1/2 inch up from the bottom of sides, back, and sub-front. Sides of drawer shall be doweled to receive drawer back and sub-front.
 - 5. 3/4 inch thick hang rails shall be mechanically fastened to end panels of all wall, base, and tall cabinets for extra rigidity and to facilitate installation.
 - 6. All cases shall be square, plumb, and true.
 - 7. Provide removable back panels and closure panels for plumbing access at all sink cabinets.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Coordinate work of this Section with related work of other Sections as necessary to obtain proper installation of all items.
- B. Verify site dimensions of cabinet locations in building prior to fabrication.

3.02 INSTALLATION

- A. Install casework in accordance with manufacturer's instructions.
- B. Erect casework straight, level and plumb and securely anchor in place. Scribe and closely fit to adjacent work. Cut and fit work around pipes, ducts, etc.
- C. Install all items complete and adjust all moving parts to operate properly.
- D. Leave surfaces clean and free from defects at time of final acceptance.

3.03 MANUFACTURER'S FIELD SERVICES

- A. Install casework under the supervision of the manufacturer's representative.

3.04 CLEANING

- A. Clean work under provisions of Section 01 70 00.
- B. Remove all cartons, debris, sawdust, scraps, etc. and leave spaces clean and all casework ready for Owner's Use.

3.05 PROTECTION OF FINISHED WORK

- A. Protect finished work under provisions of Section 01 70 00.

END OF SECTION

SECTION 14 24 23

HOLELESS HYDRAULIC ELEVATORS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies hydraulic elevators.
- B. Related Sections: The following sections contain requirements that relate to this section and are performed by other trades.
 - 1. Division 3 Concrete: Installing inserts, sleeves and anchors in concrete.
 - 2. Division 4 Masonry: Installing inserts, sleeves and anchors in masonry.
 - 3. Division 5 Metals:
 - a. Providing hoist beams, pit ladders, steel framing, auxiliary support steel and divider beams for supporting guide-rail brackets.
 - b. Providing steel angle sill supports and grouting hoistway entrance sills and frames.
 - 4. Division 9 Finishes: Providing elevator car finish flooring and field painting unfinished and shop primed ferrous materials.
 - 5. Plumbing:
 - a. Sump pit
 - 6. Heating, Ventilation and Air Conditioning:
 - a. Heating and ventilating hoistways and machine room.
 - 7. Electrical:
 - a. Providing electrical service to elevators, including fused disconnect switches.
 - b. Emergency power supply, transfer switch and auxiliary contacts.
 - c. Heat and smoke sensing devices.
 - d. Convenience outlets and illumination in machine room, hoistway and pit.

1.02 REFERENCES

- A. Comply with applicable building codes and elevator codes at the project site, including but not limited to the following:
 - 1. ANSI A117.1, Buildings and Facilities, Providing Accessibility and Usability for Physically Handicapped People
 - 2. ADAAG, Americans with Disabilities Act Accessibility Guidelines
 - 3. ANSI/NFPA 70, National Electrical Code
 - 4. ANSI/NFPA 80, Fire Doors and Windows
 - 5. ASME/ANSI A17.1, Safety Code for Elevators and Escalators
 - 6. ANSI/UL 10B, Fire Tests of Door Assemblies
 - 7. Model Building Codes

8. All other local applicable codes

1.03 SYSTEM DESCRIPTION:

A. Performance Requirements and General Characteristics:

1. Type: Holeless - Twin direct acting hydraulic cylinder without well holes
2. Quantity of Elevators: 1
3. Number of Stops: 4
4. Number of Openings: 3 at Front, 1 at Rear.
5. Total Rise: verify at site.
6. Rated Load: 2500 lb
7. Rated Speed: 100 feet per minute
8. Car Dimensions (inside): 6' - 8" wide x 4' - 3" deep
9. Note: height under ceiling: 7' - 4 1/2"
10. Hoistway Dimensions: 8' - 6" wide x 5' - 9" deep
11. Entrance Dimensions: 3' - 6" X 7' - 0"
12. Entrance Type: Single slide
13. Stopping Accuracy: $\pm 1/4"$ (6.4 mm) under any loading condition or direction of travel.
14. Main Power Supply: 208 Volts $\pm 5\%$ of normal, 3 Phase, with a separate equipment-grounding conductor.
15. Lighting Power Supply: 120 Volts, 1 Phase, 15 Amp, 60 Hz.
16. 20 HP
17. Designed for seismic zone 2.

- B. Simplex Collective Operation:** Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.

C. Operating Features:

1. Full Collective Operation
2. Single Speed Fan
3. On/Off Light Switch
4. Solid State Starting
5. Remote elevator monitoring REM® ready
6. Firefighters' Service Phase I & II

7. Top of Car Inspection
8. Car-Stall Protection
9. Access at bottom landing with zoning
10. Access at top landing with zoning
11. Emergency return unit
12. Independent service
13. Pressure Switch

D. Door Control Features:

1. Closed Loop Door Operator is a closed loop, microprocessor based door operator system. The door operator will facilitate smooth operation under varying environmental influences such as, temperature, wind, friction, and component variation. The processor will monitor the door's actual position and velocity compared to its desired position and velocity. If variations are detected in the profile the command will be automatically corrected. The Closed Loop Door Operator control system shall not require machine room door control equipment.
2. Door noise not to exceed 58dBA.
3. Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.
4. Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.

Elevator doors shall be provided with a reopening device that will stop and reopen the car door(s) and hoistway door(s) automatically should the door(s) become obstructed by an object or person.

Primary door protection shall consist of a two dimensional, multi-beam array projecting across the car door opening. Under normal operation and for any door position, the system shall detect as a blockage an opaque object that is equal to or greater than 1.3 inches (33 mm) in diameter when inserted between the car doors at vertical positions from within 1 inch (25 mm) above the sill to 71 inches (1800 mm) above the sill. Under degraded conditions (one or more blocked or failed beams), the primary protection shall detect opaque objects that are equal to or greater than 4" (100 mm) in diameter for the same vertical coverage. If the system performance is degraded to the point that the 4" object cannot be detected, the system shall maintain the doors open or permit closing only under nudging force conditions.

The door reopening device shall also include a secondary, infrared multi-beam array projecting across the door opening and extending into the hoistway door zone. The door opening device will cause the doors to reopen when it detects a person(s) or object(s) entering or exiting the car in the area between the hoistway doors or the entryway area adjacent to the hoistway doors.

The size of the secondary protection zone shall vary as the door positions vary during opening and closing. The width of the zone shall be approximately one-third the size of the separation between the doors (or door and strike plate for single-slide doors) and shall be approximately centered in the door separation. In order to minimize detection of hallway passers-by that are not entering the elevator, the maximum zone penetration into the entryway shall not exceed 20" for any door separation. Normal penetration depth into the entryway from the car doors shall be ~14" for a door separation of 42". The penetration shall reduce proportionally as the doors close. At door separations of 18" or less the

secondary protection system may cease its normal operation since the depth of the zone recedes to where it is inside the hoistway doors. The vertical coverage of the secondary protection shall be ~19" (480 mm) above the sill to ~55" (1400 mm) above the sill (mid-thigh to shoulder of a typical adult).

The secondary protection shall have an anti-nuisance feature which will ignore detection in the secondary zone after continual detection occurs for a significant time period in the secondary zone without corresponding detection in the primary protection zone; i.e. a person/object is in the entryway but does not enter. Normal secondary protection shall be re-enabled whenever detection occurs in the primary zone.

The reaction time of the door detector sub-system shall not exceed 60 milliseconds when both primary and secondary protection capabilities are active; nor 40 milliseconds when the secondary protection is disabled.

5. Door nudging operation to occur if doors are prevented from closing for an adjustable period of time.

1.04 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for each system proposed for use. Include the following:

1. Signal and operating fixtures, operating panels and indicators
2. Cab design, dimensions and layout
3. Hoistway-door and frame details
4. Electrical characteristics and connection requirements
5. Expected heat dissipation of elevator equipment in machine room (BTU)
Powder Coat paint selection: Submit manufacturer's standard selection charts for exposed finishes and materials.
6. Plastic laminate selection: Submit manufacturer's standard selection charts for exposed finishes and materials.
7. Metal Finishes: Upon request, standard metal samples provided.

- B. Shop Drawings: Submit approval layout drawings. Include the following:

1. Car, guide rails, buffers and other components in hoistway
2. Maximum rail bracket spacing
3. Maximum loads imposed on guide rails requiring load transfer to building structure
4. Loads on hoisting beams
5. Clearances and travel of car
6. Clear inside hoistway and pit dimensions
7. Location and sizes of access doors, hoistway entrances and frames

- C. Operations and Maintenance Manuals: Provide manufacturer's standard operations and maintenance manual.

- D. Certificates: Inspection and acceptance certificates of elevator system installation.

1.05 QUALITY ASSURANCE

- A. Manufacturer: Provide elevators manufactured by a firm with a minimum of 10 years experience in fabrication of elevators equivalent to those specified. Elevator manufacturer shall be ISO9001 Certified.

- B. The installer must have specialized in the installation of the products specified in this section with a minimum of five years documented experience.
- C. Regulatory Requirements:
 - 1. ASME A17.1 Safety Code for Elevators and Escalators, latest edition or as required by the local building code.
 - 2. NFPA 70 National Electrical Code.
 - 3. NFPA 80 Fire Doors and Windows.
 - 4. Americans with Disabilities Act - Accessibility Guidelines (ADAAG)
 - 5. Conform to applicable Rhode Island State Building Code, fire code and laws for manufacture and installation of elevator system.
 - 6. Conform to Rhode Island State Building Code Regulation SBC-15 for accessibility requirements.
 - 7. Fire-rated entrance assemblies: Opening protective assemblies including frames, hardware, and operation shall comply with ASTM E2074, UL10 (b), and NFPA Standard 80. Provide entrance assembly units bearing Class B or 1 1/2 hour label by a Nationally Recognized Testing Laboratory.
- D. Inspection and testing: Elevator Installer shall obtain and pay for all required inspections, tests, permits and fees for elevator installation. Arrange for inspections and make required tests.

1.06 PRE-INSTALLATION CONFERENCE

- A. Convene one week prior to commencing work of this section, under provisions of Division 1 Specifications.
- B. Require attendance of persons directly involved with the work of this section.
- C. Review schedule of installation, installation procedures and conditions, and coordination with related work.
- D. Review temporary use of elevator, hours of use, scheduling of its use, cleanliness of cab, employment of operator, maintenance of system.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Should the building or the site not be prepared to receive the elevator equipment at the agreed upon date, the Design/Builder will be responsible to provide a proper and suitable storage area on or off the premises.

Should the storage area be off-site and the equipment not yet delivered, then the elevator contractor, upon notification from the Design/Builder will divert the elevator equipment to the storage area. If the equipment has already been delivered to the site, then the Design/Builder shall transport the elevator equipment to the storage area. The cost of elevator equipment taken to storage by either party, storage, and redeliver to the job site shall not be at the expense of the elevator contractor.

1.08 NON-PROPRIETARY SERVICE CAPABILITY

- A. Design, equip, furnish, install and configure the elevator system and its components, systems and parts, including electronic components, so that regular maintenance and regular or emergency services may be

provided by any qualified professional maintenance contractor at the discretion and selection of the Owner and without any approval or certification from either the elevator manufacturer or the elevator installer. All proprietary tools are to be given to the Owner.

1.09 WARRANTY

- A. The elevator contractor's acceptance is conditional on the understanding that their warranty covers defective material and workmanship. The guarantee period shall be one (1) year from the date of Substantial Completion.

1.10 MAINTENANCE SERVICE

- A. Furnish maintenance and call back service for a period of 12 months for each elevator from date of Substantial Completion. Service shall consist of semi-monthly examination of the equipment, adjustment, lubrication, cleaning, supplies and parts to keep the elevators in proper operation.
 - 1. Maintenance work, including 24 hour-per-day, 7 day-per-week emergency call back repair service, shall be performed by trained employees of the elevator contractor.
 - 2. Submit parts catalog and show evidence of local parts inventory with complete list of recommended spare parts.
 - 3. Manufacturer shall have a service office and full time service personnel within 50 mile radius of the project site.
 - 4. Examine system components semi-monthly. Clean, adjust, and lubricate equipment.
 - 5. Perform work without removing cars during peak traffic periods.
 - 6. Perform maintenance work using competent and qualified personnel, under the supervision and in the direct employ of the elevator manufacturer or original installer.
 - 7. Maintenance service shall not be assigned or transferred to any agent or Subcontractor without prior written consent of the Owner.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Provide hydraulic elevators by Otis Elevator Company.
- B. Other acceptable manufacturers:
 - 1. Schindler Elevator
 - 2. ThyssenKrupp Elevator
- C. Substitutions under provisions of Section 01 60 00.

2.02 EQUIPMENT: GENERAL

- A. The hydraulic system shall be of compact design suitable for operation under the required pressure. The power component shall be mounted in the hydraulic-fluid storage tank. The control valve shall control flow for up and down directions hydraulically and shall include an integral check valve. A control section including control solenoids shall direct the main valve and control: up and down starting, acceleration, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. All of these functions shall be fully adjustable for maximum smoothness and to meet contract conditions. System to

be provided with a muffler and a shut-off valve.

- B. A microprocessor-based controller shall be provided, including necessary starting switches together with all relays, switches, solid-state components and hardware required for operation, including door operation, as described herein. A three-phase overload device shall be provided to protect the motor against overloading.
- C. A manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.
- D. A low voltage monitoring device shall be provided to protect against incorrect operation during low voltage (building power) occurrences.
- E. Circuit Identification: All electrical wires throughout the elevator electrical system shall be marked with a unique circuit identifying number appearing four (4) times per foot.
- F. Pressure Switch

2.03 EQUIPMENT: HOISTWAY COMPONENTS

- A. Plungers and Cylinders: Each cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure. The top of each cylinder shall be equipped with a cylinder head with a drip ring to collect any oil seepage as well as an internal guide ring and self-adjusting packing. Each plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. Each plunger shall be provided with a stop ring electrically welded to it to prevent the plunger from leaving the cylinder. Each plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.
- B. Car Guide Rails: Tee-section steel rails with brackets and fasteners.
- C. Buffer: Helical coil spring type.
- D. Wiring: Wiring for hoistway electrical devices included in scope of the elevator system, hall panels, pit emergency stop switch, and the traveling cable for the elevator car.
- E. Entrances:
 - 1. Frames: Entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be UL fire rated steel. Sills shall consist of 2 aluminum sills.
 - 2. Doors: Entrance doors shall be of metal construction with vertical channel reinforcements.
 - 3. Fire Rating: Entrance and doors shall have a UL 1-1/2 hour fire protection rating.
 - 4. Entrance Finish: Four (4) baked enamel entrances.

5. Entrance Markings: Entrance jambs shall be marked with 4" x 4" plates having raised floor markings with Braille adjacent. Markings shall be provided on both sides of the entrance.
6. Sight Guards: Black sight guards will be furnished

2.04 EQUIPMENT CAB COMPONENTS

- A. Car Frame: A suitable car frame shall be provided with adequate bracing to support the platform and car enclosure. The buffer striking plate on the underside of the car-frame platform assembly must fully compress the spring buffer mounted in the pit before the plunger reaches its lower limit of travel.
- B. Platform, Heavy Loading Type: The car platform shall be arranged to accommodate one-piece loads weighing up to 25% of the rated capacity, such as wheeled food carts, stretchers, x-ray equipment, etc. The platform shall be recessed 5/16" for flooring by others.
- C. Cab Walls: cab walls to have attached (non-removable) vertical panels finished with high pressure plastic laminate.
- D. Car front finish: baked enamel.
- E. Door finish: baked enamel.
- F. Car Top: Cold-rolled steel with hinged exit. Finish: Two coats factory applied reflective baked enamel.
- G. Ceiling: Downlight type, baked enamel metal pans with suspended LED downlights.
- H. Emergency Car Lighting: An emergency power unit employing a 6 volt, sealed rechargeable battery and totally static circuits shall be provided to illuminate the elevator car and provide current to the alarm bell in the event of building power failure.
- I. Emergency Pulsating Siren: Siren mounted on top of the car that is activated when the Alarm button in the car-operating panel is engaged. Siren shall have a rated sound pressure level of 80 dba at a distance of 3.0 m from the device. Siren shall respond with a delay of not more than 1 second after the switch or push button has been pressed.
- J. Cab Wiring: All wiring on the elevator cab shall use factory wired harnesses with Wago® Cage Clamp® plugs and receptacles, and shall terminate behind the car operating panel.
- K. Exhaust Fan: An exhaust fan shall be mounted on the car top.
- L. Utility outlet: A 125-volt 15-ampere utility outlet with ground-fault circuit-interrupter protection shall be furnished on top of the cab.
- M. Handrails: Round Tubular Metal DH154 Handrails 1-1/2" stainless steel provided on the sides of the car enclosure.
- N. Threshold: aluminum

- O. Base: stainless steel # 4
- P. Protective pad hooks and provide one set of vinyl protection pads. Color of pads selected by Owner from standard colors.
- Q. Provide certificate frame.
- R. Finished Floor: Finished floor to be Rubber Floor Landing Tiles as specified in Section 09 65 00 -not installed by elevator subcontractor.

2.05 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

- A. Car Operating Panel: A car operating panel shall be provided which contains all push buttons, key switches, and message indicators for elevator operation. The car operating panel shall have a mill satin stainless steel finish

1. Applied car operating panel shall be furnished. It shall contain a bank of round metal mechanical illuminated buttons. Flush mounted to the panel and marked to correspond to the landings served, an emergency call button, door open and door close buttons, and switches for lights, inspection and the exhaust fan. Pan shaped design is not acceptable. The emergency call button shall be connected to a bell that serves as an emergency signal. All buttons to have raised numerals and Braille markings. Red LED in center of button for illumination with flat flush targets

The car operating panel shall be equipped with the following features:

Standard:

- 1) Raised markings and Braille shall be provided to the left hand side of each push-button.
- 2) Car Position Indicator at the top of and integral to the car operating panel.
- 3) Door open and door close buttons.
- 4) Light key-switch.
- 5) Fan key-switch.
- 6) Inspection key-switch.
- 7) Elevator Data Plate marked with elevator capacity and car number.
- 8) Illuminated alarm button with raised markings.
- 9) In car stop switch.
- 10) Firefighter's hat
- 11) Firefighter's Phase II Key-switch
- 12) Call Cancel Button
- 13) Help Button – The help button shall initiate two-way communication between the car and a location inside the building, switching over to another location if the call is unanswered, where personnel are available who can take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.
- 14) Firefighter's Phase II emergency in-car operating instructions, worded according to A17.1 2000, Article 2.27.7.2.
- 15) Landing Passing Signal: A chime bell shall sound in the car to signal that the car is either stopping at or passing a floor served by the elevator.

- B. Car Position Indicator: A digital, LED car position indicator shall be integral to the car operating panel.
- C. A hands free telephone shall be provided which is designed in response to ADAAG requirements integral with the car operating panel.
- D. Hall Fixtures: Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Raised floor markings with Braille shall be provided for each push-button. Mill satin stainless finish.
- E. Landing Passing Signal: A chime bell shall sound in the car to tell a passenger that the car is either stopping at or passing a floor served by the elevator.
- F. Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the Car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound.
- G. Hall fixtures shall feature round metal mechanical buttons in flush mount face frame with vandal resistant buttons. Buttons shall be flat flush targets in vertically mounted fixture. Hall lanterns and position indicators shall be illuminated by means of LED. Fixture shall be mill satin stainless steel finish.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Take field dimensions to examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. Installation of all elevator components except as specifically provided for elsewhere by others.

3.03 DEMONSTRATION

- A. The elevator contractor shall make a final check of each elevator operation with the Owner or Owner's representative present prior to turning each elevator over for use. The elevator contractor shall determine that control systems and operating devices are functioning properly.

3.04 FIELD QUALITY CONTROL

- A. Acceptance testing: Upon completion of the elevator installation and before permitting use of elevator, perform acceptance tests as required and recommended by Code and governing regulations or agencies. Perform other tests, if any, as required by governing regulations or agencies.
- B. Advise Owner, Design/Builder, and governing authorities in advance of dates and times tests are to be performed on the elevator.

3.05 ADJUSTING

- A. Make necessary adjustments of operating devices and equipment to ensure elevator operates smoothly and accurately.
- B. Adjust automatic floor leveling feature at each floor to achieve 1/4" from flush.

3.06 CLEANING

- A. Clean work under provisions of Specification Division 1.
- B. Before final acceptance, remove protection from finished surfaces and clean and polish surfaces in accordance with manufacturer's recommendations for type of material and finish provided.
- C. At completion of elevator work, remove tools, equipment, and surplus materials from site. Clean equipment rooms and hoistway. Remove trash and debris.

END OF SECTION

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SECTION 31 23 00

EARTHWORK

PART 1 - GENERAL

1.01 WORK INCLUDES:

- A. Without limiting the generality thereof, the work under this Section includes the furnishing of all labor, equipment, supplies and materials and the performing of all operations in connection with the following items:
 - 1. Stripping and stockpiling of topsoil and materials suitable for reuse.
 - 2. Stripping and disposal of existing paving, including base course for utility construction.
 - 3. Excavation and disposal of unsuitable or excess materials, including existing pavements.
 - 4. Excavation, fill, backfill and refill, as indicated or required, including compaction.
 - 5. Rock removal.
 - 6. Rough grading, including compaction of existing materials and granular fills, backfills and refills.
 - 7. Gravel under slabs and footings in the building area as directed, including compaction.
 - 8. Trench excavation, bedding and backfill for all utilities, as directed, including compactions.
 - 9. Dewatering and control of water, as required, for all construction operations.
 - 10. Protection of existing buildings, pavements and utilities to remain.
 - 11. Sheeting, shoring and bracing of structural and trench excavations.
 - 12. Removal of rock and/or ledge to insure a minimum of 12" cushioning between rock and footing.

1.02 RELATED SECTIONS

- A. Section – 03 31 00 - Concrete
- B. Section – 32 12 00 - Asphalt Paving
- C. Section – 32 92 19 - Seeding

1.03 REFERENCES:

- A. Within this section, the Rhode Island Standard Specification for Road and Bridge Construction, latest edition, will be referred to as the "State Standards". All references to measurement and payment are deleted.
- B. AASHTO M-145: The classification of soils and soil - aggregate mixtures for highway construction purposes.

1.04 BUILDING AREA:

- A. The area within limits indicated on the drawings beyond exterior face of the building is herein defined as the building area. All requirements for structure excavation and for fills and refills within the building area shall extend to these lines.

1.05 LAWS AND REGULATIONS:

- A. All work under this Contract shall be accomplished in accordance with regulations of local, county and state and federal agencies and national or utility company standards as they apply.
- B. Requirements of Regulatory Agencies
 - 1. Comply with all municipal, state and federal laws, ordinances, rules, orders and regulations pertaining to the work including all waivers issued to date. Design/Builder shall furnish all bonds necessary to get permit for cuts and connections to water services.
 - 2. Comply with applicable requirements of American National Standards Institute (ANSI) Standard A10.6-1969, Safety Requirements for Demolition.
- C. Notify all corporations, companies, individuals or local authorities owning, or having jurisdiction over, utilities running to, through or across areas disturbed by demolition operations. The Design/Builder shall notify the following prior to beginning operations.
 - 1. Digsafe
 - 2. All utility companies whose services are within 10 feet of the work of this contract.
- D. Comply with the provisions of the Manual of Accident Prevention in Construction of the Associated General Contractors of America, Inc. and the requirements of the Occupational Safety and Health Administration, United Department of Labor.
- E. All protection work and general operations shall be governed by the requirements of OSHA, as most recently amended.
- F. The term "Local Standards" as used herein means the standards of design and construction of the respective municipal department or utility company. Said standards apply except where exceeded by this specification.

- G. Maintain in operating condition all active utilities, sewers, gutters and other drains encountered in the utility installation. Repair to the satisfaction of the Owner of the improvement any surface or subsurface improvement damaged during the course of the work (unless such improvement is shown to be abandoned or removed).

1.06 TESTING:

- A. Compaction and soil testing will be performed under provisions of Section 01 45 00.
- B. Ensure compacted fills are tested before proceeding with placement of surface materials.

1.07 SUBMITTALS:

- A. Submit under provisions of Section 01 33 00.
- B. Submit minimum 10 lb. samples of each type of fill material to be used. Forward samples to appointed testing laboratory, packed tightly in containers to prevent contamination.

1.08 PROTECTION:

- A. Protect trees, shrubs, areas to receive planting, rock outcropping, and other features remaining as part of final landscaping.
- B. Protect bench marks, roads, sidewalks, paving, and curbs against damage from equipment and vehicular or foot traffic.
- C. Protect excavations by shoring, bracing, or other methods, as required to prevent cave-ins of loose dirt from failing into excavations.
- D. Protect adjacent, existing utility services that may be damaged by excavation work.
- E. Notify Owner of unexpected sub-surface conditions and discontinue work in area until Owner provides notification to resume work.
- F. Protect bottom of excavations and soil around and beneath foundations from frost.
- G. Grade around excavations to prevent surface water run-off into excavated areas.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Procurement: The Design/Builder shall provide approved general borrow, granular backfill, and fine gravel bedding, as well as graded filter materials for use around both BCCMP combination drains and pours concrete subdrain pipe in the quantities and of the qualities necessary for the proper completion of the work of the contract. The source of all off-site gravel borrow, granular backfill, fine gravel bedding, and graded filter materials shall be the responsibility of the Design/Builder and shall be subject to the approval of the Owner. The Design/Builder shall obtain

the right to procure the materials from the source and furnish the Owner with a duplicate copy of a written agreement with the source from which materials are to be obtained. All resulting excavations shall be left in such satisfactory condition as is required by the agreement with the source.

2.02 FILL MATERIALS: Unless specifically shown otherwise, use the following materials:

- A. "GRADED GRAVEL FILL" (under slab and building area; although a similar graded bank-run gravel may be acceptable) free from loam and other specified undesirable materials, conforming to the following analysis:

<u>Sieve Size</u>	<u>% Passing</u>
3"	100
1-1/2"	75-95
3/4"	60-85
3/8"	45-75
#4	30/65
#40	6-25
#200	0-4

On site material may be used under building areas only after satisfactory test data has been submitted, and only with the Owner's approval.

- B. "Bank Run Gravel" in pipe trenches, around manholes and catch basins, against damproofed foundation walls, where indicated as "gravel fill", and where else shown, free from loam and other specified undesirable material, and conforming to the following analysis:

<u>Sieve Size</u>	<u>% Passing</u>
3"	100
1/2"	50-85
3/8"	50-80
#4	40-75
#40	15-35
#200	0-8

On site material may be used, only after satisfactory test data has been submitted, and only with the Owner's approval.

- C. "Stone" (to stabilize utilities and foundations as necessary and where indicated) conforming to the following analysis:

<u>Sieve Size</u>	<u>% Passing</u>
2-1/4"	100
2"	90-100
1-1/2"	30-55

1-1-1/4"	0-25
1"	1-5
#200	0

- D. "Sand" (if indicated) consisting of clean, inert, hard, durable grains of quartz or other hard durable rock; free from loam or clay, surface coatings and deleterious material; and conforming to the following analysis:

<u>Sieve Size</u>	<u>% Passing</u>
#8	100
#50	25-50
#100	0-10
#200	0-5

- E. Fill Material for Trenches:

Bedding for pipe - "Bank Run Gravel", except with 100% passing 3/4" sieve (stone if unsuitable material is encountered).

Overpipe - Two 6" layers of "Bank Run Gravel", except with 100% passing 3/4" sieve.

Remaining Fill - "Bank Run Gravel"; approved on-site or new material, free from stones over 4" diameter and other specified undesirable materials.

PART 3 - EXECUTION

- 3.01 CLEARING: All trees except those indicated to remain, and all brush, stumps, vines, and obstructions within the indicated project limit lines shall be removed entirely unless otherwise indicated. Existing trees to remain shall be protected from injury. No cutting and trimming of trees to remain will be permitted. Trees to remain that may be damaged by construction operations shall be boxed and protected as directed until the project is completed. All stumps shall be removed entirely. Roots shall be grubbed out to at least 18" below subgrades. All timber, brush, refuse, stumps, roots, vines, debris and objectionable matter shall be disposed of off the site. All excavation and depressions resulting from clearing operations shall be filled with approved earth and topsoil, and compacted as specified.
- 3.02 CONSERVATION TOPSOIL: Over all areas to be regraded, occupied by new structures or pavements, or disturbed by work operations, topsoil which is determined to be of good quality shall be carefully removed for its full depth, transported and deposited in storage piles, located conveniently to the areas which will subsequently receive topsoil. Topsoil stockpiles shall be kept separate from other excavated materials and free of roots, stones and other undesirable material. The Design/Builder shall take precautions to prevent objectionable materials from becoming mixed with the topsoil either before or after the stripping and stockpiling operations. Stripping operations shall be completed prior to excavation, trenching or grading operations. All stockpiles shall be neatly trimmed and graded without depressions to provide surface drainage as directed by the Owner.
- 3.03 DISPOSAL OF MATERIAL: All materials resulting from excavations and classified as earth and approved as suitable by the Owner shall be used for backfilling, filling and such rough grading as is

required on the project site. All excavated materials not approved for backfill and fill shall be removed and disposed of off the project site at no additional expense to the Owner.

3.04 SHEATHING, SHEETING, SHORING AND BRACING:

- A. Excavations shall be sheathed, sheeted, shored and braced by members to prevent danger to persons, structures, adjacent property, caving, erosion, or loss of ground. Special precautionary measures shall be provided to protect existing pavement and structures from damage. Sheeting and timbering shall be left in place until adjacent excavations have been backfilled and compacted, then with the Owner's approval, removed. It shall be the Design/Builder's responsibility for any damages whatsoever due to the failure of the sheeting, settlement, filled excavations, or the ground adjacent thereto. Care shall be taken to prevent damage to all utilities and services. Any damage to new or existing work occurring through settlement, water or earth pressure, or other causes due to inadequate bracing or other construction operations of the Design/Builder, shall be satisfactorily repaired. All work done concerning temporary sheeting, shoring, bracing, excavations to extra widths, and either repairs to, or the correction of, damaged work shall be provided by the Design/Builder at no additional expense to the Owner.
- B. Unless otherwise directed by the Owner, timber sheeting and bracing left in place shall be cut off as follows:
 - 1. Permanent timber sheeting shall be cut off at an elevation 2' below ground level.
 - 2. The bottom portion of temporary timber sheeting (partially withdrawn) shall be cut off at an elevation 2' above the top of pipeline.

3.05 REMOVAL OF WATER AND PROTECTION FROM FLOODING:

- A. The Design/Builder shall provide, construct and maintain, at no additional expense to the Owner, all pumps, piping, drains, well points, or any other facility for the control and collection of ground water or surface water. The dewatering operations shall insure that all excavations are kept free from water to permit construction work to be performed in the dry. Damage resulting from the failure of dewatering operations or to maintain the area of all structures and work in a suitable dry condition shall be repaired as directed by the Owner at no additional expense to the Owner. The pumping and dewatering operations done in a manner that no loss of ground will result. Precautions shall be taken to protect new and existing work from flooding during storms or from other causes. Pumping shall be continuous where directed by the Owner to protect the work and/or to maintain satisfactory progress. All pipelines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected. Water shall not be conducted onto adjacent property. In depressions to be excavated within the building structure limits, dewatering operations necessary for the control and collection of surface and ground water shall be utilized until such time as the permanent gravity subdrainage system is palced in operation to eliminate the possibility of hydrostatic uplift on foundations, floor slabs and all other construction.

3.06 EXCAVATIONS:

- A. Excavate all substances encountered to the limits, lines and grades indicated or specified or as directed by the Owner. Excavations carried below the depths indicated, except as directed by the Owner, shall be refilled to the proper level with thoroughly compacted approved fill, except that in excavations for walls and footings the concrete shall be extended to the bottom of the excavations; all additional work of this nature shall be provided by the Design/Builder at no additional expense to the Owner. Such grading shall be done as may be necessary to prevent surface water from flowing into trenches and to keep excavations free of standing water and to prevent damage to other structures. Excavations shall extend to a sufficient distance from walls and footings to allow for placing and removal of forms, installation of services, and inspection. Bottoms of excavations shall be protected from frost: work shall not be placed on frozen ground nor shall work be placed on wet unstable ground. If suitable bearing is not encountered at the depth indicated on the Drawings, the Design/Builder shall immediately notify the Owner and shall not proceed further until instructions are given. Excavations for interior floor slabs shall be made to provide for gravel fill.
- B. Excavations for other structures: Excavations for subdrainage, underdrains, sanitary, electrical, gas, water and all other utility systems structures shall be made in earth and rock to the indicated depths below the bottoms of foundations and slabs so that the required thickness of compacted gravel courses can be provided.
- C. Trenches:
 - 1. Trenches shall be of necessary width for the proper laying of the pipe and the banks shall be as nearly vertical as practicable. The bottom of the trenches shall be accurately graded to provide uniform bearing and support for each section of the pipe on undisturbed soil at every point along its entire length, except for the portions of the pipe sections where it is necessary to excavate for bell holes and for the proper sealing of pipe joints. Bell holes and depressions for joints shall be dug after the trench bottom has been graded, and in order that the pipe rest upon the prepared bottom for as nearly its full length as practicable, shall be only of such length, depth and width as required for properly making the particular type of joint.
 - 2. Except where rock or boulders are encountered, care shall be taken not to excavate below the depths indicated. Whenever wet or otherwise unstable soil that is incapable of properly supporting the pipe, as determined by the Owner, is encountered in the bottom of the trench, such soil shall be removed to the depth required and the trench backfilled to the proper grade with coarse sand, fine gravel or other suitable material, as approved by the Owner.
 - 3. During excavation, material suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. Special requirements relating to specific utilities are as follows:
 - a. For sanitary sewers, the width of the trench at and below the top of the pipe shall be such that the clear space between the barrel of the pipe and the trench wall shall not exceed 8" on either side of the pipe. The width of the trench above that level

may be as wide as necessary for sheeting, bracing, and the proper performance of the work. The bottom of the trench shall be rounded so that at least the bottom quadrant of the pipe rests firmly on undisturbed soil for as nearly the full length of the barrel as proper jointing operations will permit. This part of the excavation shall be done manually only a few feet in advance of the pipe laying by men skilled in this type of work.

- b. Except in the cases where water lines must be graded as indicated on the Drawings, to avoid high points and the necessity of placing air release and vacuum valves, trenches for water lines shall be of a depth that will provide a minimum cover over the top of the pipe of 4.5 feet, or as otherwise indicated or directed, from the existing ground surface or the indicated finish grade, whichever is lower, and avoid interference of the water lines with other utilities.
- c. Excavation and backfill for electrical conduit shall be performed to the details indicated and in accordance with the requirements specified under Division 16 "Electrical". Backfill shall be provided to the depth indicated.

3.07 **DUST CONTROL:** Stockpiled excavated material shall be kept sufficiently damp or treated with calcium chloride to keep dust at a minimum.

3.08 **EXCAVATION OF EXISTING PAVEMENT**

- A. All areas of existing pavement shall be removed as indicated, as specified and as required for the construction of the work under this contract.
- B. Where excavation of existing roadway pavement outside of property lines is necessary, the existing pavements shall be removed only to the extent required for construction purposes leaving straight vertical edges as approved. After backfill has been placed and approved, the pavements shall be restored to match the existing pavements and in a manner as approved by the controlling authorities.
- C. It shall be the responsibility of the Design/Builder to obtain all permits, verify existing conditions and perform the work in accordance with the requirements of the controlling authorities. The Design/Builder shall be responsible for all costs concerning replacement of pavement will be made therefor.
- D. Disposal of asphalt pavement: The Design/Builder shall be responsible to dispose of excavated asphalt pavement, which is considered a hazardous material, in accordance with all Local, State, and Federal requirements.

3.09 **FILLING AND BACKFILLING:**

- A. Preparation of Ground Surface for Fill: All unsuitable material within the area upon which fill is to be placed shall be stripped or otherwise removed before the fill is started. In no case will such objectionable material be allowed to remain in or under the fill area. Prepared surfaces shall be wetted and compacted when so directed by the Owner.

- B. Fills or Embankments: Fills shall be constructed at the locations and to the lines and grades indicated and as directed. The completed fill shall correspond to the shapes shown or shall meet the requirements of the particular case. All suitable material removed from the excavations shall be used in forming the necessary fill. All fill materials shall be reasonably free from roots or other organic material, trash, frozen materials, and from all stones having a dimension greater than 4".
1. The materials shall be placed in successive horizontal layers of from 9" to 12" in loose depth as specified or directed by the Owner, for the full width of the cross-section and compacted as hereinafter specified. The top 18" of subgrade fill under paved areas, gravel roadways, and walks shall be non-frost susceptible material.
- C. Filling and Backfilling for Structures
1. Prior to backfilling, all forms shall be removed and the excavations shall be cleaned of all trash and debris.
 2. Material for filling and backfilling shall consist of the excavation, sand, gravel or other materials approved by the Owner and/or as specified, and shall be free from refuse, frozen material, vegetable matter and stones larger than 4" in any dimension. Material resulting from rock or ledge excavation shall not be used for filling or backfilling for structures.
 3. Fill and backfill shall be placed in horizontal layers, not in excess of 9" in loose thickness, and shall have a moisture content such that the required degree of compaction may be obtained. Each layer shall be compacted by mechanical vibrating rollers or machine tampers or by other suitable and approved compaction requirements to a density that will prevent excessive settlement or shrinkage in accordance with the compaction maintained; special care shall be taken to prevent any wedging action or eccentric loading upon or against the structures and all slopes bounding such wedging action.
 4. During filling and backfilling operations and in the formation of embankments, the Design/Builder shall be responsible for taking all necessary precautionary measures to assure that the equipment used will not overload the structures during the compaction of fills and backfills.
 5. The indicated thickness of compacted gravel borrow shall be provided beneath all building structure slabs, walls and in allocations so indicated on the Drawings.
- D. Finished Excavation, Fills and Embankments All areas indicated on the plans as well as excavated, filled and transition sections, shall be uniformly and smoothly graded. The finished surface shall be reasonable smooth, compacted, and free from substantial irregularities. The degree of finish shall be that ordinarily obtainable from either blade grader or scraper operations except as otherwise specified. The finished surface shall be not more than 0.15 feet above or below the established grade or approved cross-section. The surface or embankments and other areas to be paved shall not vary more than 0.05 feet from the established grade and approved cross-section.
- E. Preparation of Subgrade for Paved Areas, Gravel Roadways, Walks

1. After the subgrade has been shaped to line, grade and cross-section, it shall be thoroughly compacted. This operation shall include any required reshaping and wetting to obtain proper compaction.
2. All soft or otherwise unsuitable material shall be removed and replaced with gravel borrow material as specified hereinafter.
3. All boulders or ledge stone encountered in the excavation shall be removed or broken off to a depth of not less than 6" below the subgrade. The resulting area and all other low sections, holes or depressions shall be brought to the required grade with material approved by the Owner and the entire subgrade shaped to line, grade and cross-section and thoroughly compacted as herein provided. The top 6" of the subgrade shall in every area be compacted to 95% of the maximum dry density obtained at optimum moisture content, as determined by the method specified hereinafter.

F. Backfilling of Trenches

1. The trenches shall not be backfilled until all repaired pressure tests are performed and until the utilities systems as installed conform to the requirements specified.
2. All backfill shall be free from vegetable matter, frozen material, refuse and stones larger than 4" in any dimension.
3. Except as specified otherwise herein, fill and backfill shall be placed in layers not more than 6" thick in loose depth and each layer shall be compacted thoroughly and evenly; the moisture content of the fill material shall be such that the proper compaction will be obtained. Backfilling of trenches shall progress as rapidly as the construction and testing of the work will permit.
4. In backfilling pipe trenches, approved fill shall be compacted in 6" layers in loose depth to the indicated thickness over the top of the pipe; the remainder of the trench shall be backfilled with loose-depth layers of 1' and thoroughly compacted. When trenches have been excavated in areas to be paved, however, the backfill shall be placed and compacted in layers 6" thick in loose depth to the top of the trench.
5. When drainage pipes, utilities, and structures other than building foundations are to be placed in fill, the fill shall be constructed to the finished grades of the fill prior to excavations for the trenches.
6. During the backfilling of all trenches, care shall be taken so that either displacement or injury to pipe lines is avoided.
7. Existing grades that are to remain but which are disturbed by the Design/Builder's operations shall be graded or repaired to match adjacent surfaces. A layer of compacted fine gravel bedding, as specified hereinafter, shall be provided where indicated on the plans.

- G. Placement of Backfill adjacent to the retaining walls shall be such that symmetrical backfill loading is maintained. The Design/Builder shall take special care to prevent the occurrence of any wedging action against the retaining wall. During backfilling operations, care shall be exercised so that the use of compaction equipment does not overload the retaining wall. If a power roller is used for compaction, the roller edge must not approach nearer than 4 feet from the face of the wall. The space left shall be machine tamped to the required density as specified hereinafter.

- 3.10 EXCAVATION AND BACKFILLING FOR ALL OTHER TRADES: Excavation and backfilling for all mechanical, electrical, and such other trades inside and outside of the building shall be performed under this Section unless otherwise specified.
- 3.11 PROTECTION OF UTILITY LINES Utilities that are shown on the drawings or the locations of which are made known to the Design/Builder prior to excavation, as well as the utility lines construction during excavation operations, shall be protected from damage during excavation and backfilling, and if damaged, shall be repaired by the Design/Builder in a manner satisfactory to the Owner in no additional expense to the Owner.
- 3.12 PROTECTION OF SUBGRADE FOR PAVED AREAS AND GRAVEL ROADWAY The finished subgrade shall not be disturbed by traffic or other operations and shall be maintained by the Design/Builder in a satisfactory condition until the finish courses are placed. Until the subgrade has been checked for compliance therewith and approved, no finish course material shall be installed thereon. The storage or stockpiling of materials on finished subgrade will not be permitted.
- 3.13 COMPACTION:
- A. Test: The degree of compaction and the density shall be determined in accordance with Method D of AASHTO test Designation T180-57.
- B. Degree of Compaction:
1. Each layer of all fills, backfills, or embankments both side and outside and limits of buildings, except backfills and fills adjacent foundations, and walls, and except the top 6" of the subgrade for walks, pavements, footings and walls, shall be compacted to at least 90 percent of maximum dry density at optimum moisture content, as determined by the method given above. The top 6" of subgrade under walks, roadways, pavements, shall be compacted to at least 95 percent of maximum dry density at optimum moisture content, as determined by the method given above. All fills and backfills adjacent to foundations and walls inside the building limits shall be compacted with approved types of equipment to at least 95 percent of maximum dry density at optimum moisture content as determined by the method given above.
 2. For trenches, each layer of backfill shall be moistened and compacted to a density at least equal to that of the surrounding undisturbed earth. Such compaction shall be accomplished in such a manner as to permit the rolling and compaction of the filled trench with the adjoining earth to provide the required bearing value. In paved area, rolling and compaction of trenches shall be accomplished so that paving of the area can proceed immediately after backfilling is completed.

C. Compaction Test Results:

1. General Fill: 1 Test for each 2000 s.f. of surface area per lift.
2. Backfill: 1 Test for each 1000 s.f. of surface area per lift.
3. Under Footings: A minimum of six locations prior to footings pours.

D. Compaction Control: The Owner shall have compaction tests made in accordance with AASHTO Standard Method T147-54 as the work progresses to determine the degree of compaction being obtained by the Design/Builder. Compaction tests shall be performed in the field for each layer of fill placed and compacted, as directed by the Owner. No succeeding layer of fill shall be placed until approval has been given by the Owner to do so. Any corrective work required as a result of the testing, such as additional compaction or a decrease in the thickness of layers, shall be performed by the Design/Builder, at no additional expense to the Owner. Compaction control tests will be made at no expense to the Design/Builder although the Design/Builder's assistance and cooperation will be required for obtaining samples.

3.14 ROADS TO BE KEPT CLEAN: The Design/Builder shall be responsible for keeping roads clear of all spillage from trucks when hauling borrow to or hauling surplus materials from the project site.

3.15 WETLAND PROTECTION: The Design/Builder shall be responsible to maintain the wetland protection as shown. The Design/Builder shall be responsible for any damage to any wetland areas.

END OF SECTION

SECTION 32 12 00

ASPHALT PAVING
(Alternate No. 2)

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Asphalt concrete paving and traffic paint.

1.02 RELATED WORK

- A. Section 02 31 23 - Earthwork

1.03 SYSTEM PERFORMANCE

- A. Perform work in accordance with State of Rhode Island Highway Standards.
- B. Mixing Plant: Conform to State of Rhode Island standards.
- C. Obtain materials from same source throughout.

1.05 REGULATORY REQUIREMENTS

- A. Conform to Rhode Island standards for paving work on public property.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Do not place asphalt when base surface temperature is less than 50 degrees F.

PART 2 - PRODUCTS

2.01 BASE COURSE MATERIALS

- A. Granular Base: gravel as specified in Section 02 20 00.

2.02 ASPHALT PAVING MATERIALS

- A. Aggregate: Conforming to Article M.03.02.3 in the reference standard.
- B. Binder Course: Graded within the following limits as found under heading "Binder Course" table on page 380 of the referenced standard.

<u>Sieve Size</u>	<u>Percent Passing</u>
1 inch	100
3/4 inch	90 to 100

3/8 inch	40 to 65
No. 8	25 to 40
No. 50	8 to 17
No. 200	2 to 6

- C. Surface Course: Graded within the following limits as found under heading "Medium Mixture Type I-1" table on page 380 of the referenced standard.

<u>Sieve Size</u>	<u>Percent Passing</u>
3/4 inch	100
1/2 inch	80 to 100
3/8 inch	70 to 90
No. 4	50 to 70
No. 8	35 to 50
No. 30	18 to 29
No. 50	13 to 23
No. 100	8 to 16
No. 200	3 to 8

- D. Asphalt Cement: Conforming to Article M.03.02.1 (revision of June 1, 1974) of the reference standard.
1. Percentage by weight in mixture: 3 to 6 for Binder Course and 6.5 to 8 for Surface Course.
- E. Maintain thorough and uniform mixture.
- F. Bring asphalt cement and mineral constituents to temperatures required in reference standard before mixing. Ensure aggregates are sufficiently dry so as not to cause foaming in mixture.

2.03 TRAFFIC PAINT

- A. Traffic Marking Paint: TTP-1952b Traffic Paint by SealMaster.
1. Cold spray applied acrylic waterborne traffic paint, meets federal specification TTP-1952b, white.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify compacted granular base is dry and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.
- C. Beginning of installation means acceptance of substrate.

3.02 PLACING ASPHALT PAVEMENT

- A. Place binder course within 24 hours of priming base surfaces.
- B. Place binder course to compacted thickness of 1-1/2 inch; place topping course to compacted depth of 1-1/2 inch at roads and parking areas.
- C. Place surface course within 12 hours of placing and compacting binder course.
- D. Compact pavement by rolling. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
- E. Develop rolling with consecutive passes to achieve even and smooth finish, without roller marks.
- F. Ensure joints made during paving operations are straight, clean, vertical and free of broken or loose material. Prime vertical surfaces of joints to ensure tight bond.
- G. Apply traffic paint in accordance with manufacturer's instructions.
 - 1. Install lines and symbols on asphalt in locations and patterns to match existing or as otherwise directed by Owner.
 - 2. Apply traffic paint to new asphalt surfaces no earlier than four weeks after pavement installation.

3.03 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- B. Compacted Scheduled Thickness: Within 1/4 inch of design thickness.
- C. Variation from True Elevation: Within 1/2 inch.

3.04 CLEANING

- A. Clean under provisions of Section 01 70 00.

3.05 PROTECTION

- A. Immediately after placement, protect pavement under provisions of Section 01 70 00 from mechanical injury.

END OF SECTION

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SECTION 32 31 13.13

SECURITY FENCE AND GATES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. PVC coated galvanized chain link fencing.
- B. Overhead supported sliding gates with motor operators.

1.02 SUBMITTALS

- A. Submit shop drawings and product data under provisions of Section 01 33 00.

1.03 QUALIFICATIONS

- A. The manufacturer and installer shall specialize in performing the work of this section with minimum of three years documented experience.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Fabric: Chain link fabric shall be zinc coated per ASTM-392 Class 2. Fabric shall be woven from 9 gauge (coated size) wire in 2" mech. Fabric 60" high and under shall be knuckled at both selvages. Fabric 72" high and over shall be knuckled at one selvage and twisted and barbed at the other selvage.
- B. Line Posts: Line posts shall be minimum 2.375" O.D. standard weight Schedule 40 galvanized pipe with minimum bending strength of 201 pounds under a 6' cantilever load.
- C. Top and Brace Rail: Top and brace rails shall be minimum 1.66" O.D., standard weight Schedule 40 galvanized pipe with minimum vertical bending strength of 202 pounds on 10' span coated with 1.8 ounces of hot dipped zinc in accordance with ASTM-F1083. Top rail couplings 6" minimum in length shall be spaced at maximum 21' centers. Fabric tie wire shall be spaced at 24" maximum centers.
- D. Terminal Posts: All end, corner, and pull posts shall be minimum 2.875" O.D. galvanized standard weight pipe with minimum bending strength of 381 pounds on 6' cantilever load coated with 1.8 ounces of hot dipped zinc in accordance with ASTM-F1083.
- E. Gate Frames: Gate frames shall be tubular shaped, minimum 1.90" outside diameter with welded or steel fitted corners. Braces, and trusses shall be furnished when necessary.

- F. Gate Posts are to be galvanized pipe sized as required to support overhead slide rails and gate weight.
- G. Stretcher Bars: One piece lengths equal to full height of fabric with a minimum cross-section of 3/16 inch by 3/4 inch. Provide stretcher bars for each gate, end, corner and pull posts.
 - 1. Stretcher bar bands and clips: Heavy pressed steel, or malleable iron.
- H. Privacy Slats: Provide extruded aluminum privacy slats weaved into all chain link fabric around entire sally port. Slats are to be minimum 11 gauge and have a baked-on paint finish in color selected by Owner from manufacturer's standard colors.

2.03 GATES

- A. Gates are to be sliding, overhead rail design.
- B. Fabrication: Assemble gate frame by welding connections. Use same fabric as for fence. Install fabric with stretcher bars at edges. Attach stretcher bars to gate frame at not more than 15 inch o.c. Attach hardware with rivets or by other means that will provide security against removal or breakdown.
 - 1. Over 8 ft. wide, provide additional horizontal and vertical members to ensure proper gate operation and for attachment of fabric, hardware and accessories.
 - 2. Bracing: Provide diagonal cross-bracing consisting of 3/8 inch diameter adjustable length truss rods on gates where 4 sided tension rods are not used. Provide frame rigidly without sag or twist.
- C. Gate Hardware: Galvanize per ASTM A153.
 - 1. Provide rollers, stops, etc. as required.
- D. Provide motor operators, chains, control boxes, etc. as required to run gates. Operator power to be sized as required and recommended by manufacturer. Operators are to be remotely operated with controls located in the Police Headquarters' dispatch room. Provide all electrical power as required.

2.04 CHAIN LINK FENCING FINISH

- A. Chain link fence, framework and fittings shall be in accordance with US Government Specification RR-F-191 for fusion bonded polyvinyl chloride on galvanized steel.
 - 1. Fabric: Vinyl fusion bonded steel fence fabric over #9 galvanized wire in Black finish; coating thickness to be 7 mils minimum.
 - 2. Frame system: Vinyl fusion bonded, tubular pipe design, galvanized material coated in Black finish; coating thickness to be 10 to 15 mils in thickness.
 - 3. Provide vinyl fusion bonded line, corner and terminal posts, top and bottom rails, brace bars, tension and truss rods, dome caps, etc. as required for a complete system.

2.05 SETTING MATERIALS

- A. Pipe Sleeves: Galvanized "Schedule 40" pipe with I.D. 1/2 inch larger than the O.D. of post, and closed at the bottom with cap or welded plate.

- B. Grout: Quick set POR-ROK expanding concrete as manufactured by Hallemite Manufacturing Company, Cleveland, Ohio or equal.

2.06 RAZOR WIRE

- A. Stainless steel, single coil, concertina pattern, razor wire with 2.5" long barb blades, 18" dia. coil, 12" loop to loop spacing.
- B. Provide all st. st. clips, tie wire, brackets and fasteners as required to attach to fence.

PART 3 - EXECUTION

3.01 POST INSTALLATION

- A. Layout:
 - 1. End, Corner and Pull Post: Provide at termination and change in horizontal or vertical direction of 30 degrees or more.
 - 2. Line Posts: Space uniformly at approximately 8 feet on center.
- B. Concrete Set Posts:
 - 1. Set post not less than 48 inches below grade.
 - 2. Place concrete around posts in a continuous pour, tamp for consolidation. Trowel finish tops of footings, and slope or dome to direct water away from posts.
 - 3. Gate posts and hardware: Set keepers, stops, sleeves and other accessories into concrete.
- C. Check each post for vertical and top alignment and hold in position during placement and finishing operations.

3.03 FABRIC INSTALLATION

- A. Fabric: Install fabric on security side of fence, and attach to framework so that fabric remains in tension after pulling force is released. Pull fabric taut and tie to posts, rails, and tension wires. Leave approximately 2 inches between finish grade and bottom selvage.
 - 1. Ties: Fabric to rails and braces at 24 inches o.c. and line posts at 14 inches o.c.
 - 2. Hot Rings: Attach fabric to tension lines at 24 inches o.c.
- B. Stretcher Bars: Extend through fabric and secure to end, corner, pull and gate posts with bands or clips spaced not over 15 inches o.c.

3.04 ACCESSORIES

- A. Tie Wires: Use U-shaped clip or wire, securely fastened around pipe clasping pipe and fabric firmly. Bend ends of wire to minimize to persons or clothing.
- B. Fasteners: Install nuts for tension band and hardware bolts on side of fence opposite fabric side.
- C. Bolts: Used in the construction of fence shall be thoroughly peened.

- D. Gaps between top of fencing & gates and the underside of the sally port roof are to be filled with razor wire as specified above.

3.05 GATES

- A. Install gates plumb, level and secure for full opening without interference.
- B. Install motor operators on concrete pads. Provide metal platforms as required to raise motors to a proper operable height as required by manufacturer.
- C. Adjust hardware for smooth operation and lubricate where necessary.

END OF SECTION

SECTION 32 92 19

SEEDING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Finish grade subsoil
- B. Place, level, and compact topsoil
- C. Fertilizing
- D. Seeding
- E. Maintenance

1.02 RELATED SECTIONS

- A. 31 23 00 - Earthwork

1.03 REFERENCES

- A. FS-O-F-241 - Fertilizers, mixed, commercial

1.04 DEFINITIONS

- A. Weeds: Includes Dandelion, Jemsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perrenial Sorrel, and Brome Grass.

1.05 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Provide data on seed mixture.

1.06 REGULATORY REQUIREMENTS

- A. Comply with regulatory agencies for fertilizer and herbicide composition.

1.07 QUALITY ASSURANCE

- A. Provide seed mixture in containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01 60 00.
- B. Deliver grass seed mixture in sealed containers, damaged packaging not acceptable.
- C. Deliver fertilizer in waterproof bags showing weight, chemical analysis and name of manufacturer.

1.09 MAINTENANCE SERVICE

- A. Furnish service and maintenance of seeded areas until date of Substantial Completion, or Final Acceptance.
- B. Maintenance shall begin immediately after each portion of lawn is planted and shall continue until the work has been officially accepted. All grassed areas shall be kept in a healthy, growing condition by watering, weeding, mowing, rolling, trimming, edging and by any other necessary operations of maintenance.
- C. All areas and parts of areas which fail to show an adequate strand of grass, for any reason whatever, shall be reseeded, repeatedly if necessary, until all areas are covered with an adequate growth of grass. All seeded areas shall be maintained and all reseeding shall be provided at no additional expense to the Owner.
- D. Water shall be furnished by the Design/Builder as required for the execution of all work under this Section, including maintenance, until the work is completed.
- E. Grass shall be cut at a height of 2 inches.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Grass Seed:

UNIVERSITY OF RHODE ISLAND

Grass Seed Mixture Improved No. 2

	<u>%Purity</u>	<u>%Germ.</u>	<u>%by Wgt.</u>
Creeping red or Chewing's fescue	98	90	40
Baron Kentucky Bluegrass	85	75	20
Improved Kentucky Bluegrass	85	75	20
Improved Perennial Rye95	90	20	

- B. Fertilizer: FS O-F-241, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil to the following proportions: Nitrogen 10 percent, phosphoric acid 6 percent, soluble potash 4 percent.

- C. Water: Clean, fresh and free of substances or matter which could inhibit vigorous growth of grass.
- D. Stakes: Softwood lumber, chisel pointed.
- E. String: Inorganic fiber.
- F. Edging: Galvanized steel.

PART 3 - EXECUTION

- 3.01 **GRADES:** The subgrades of the grassed areas are required to be established 6 inches below finished grade. Grades not otherwise indicated shall be of uniform levels or slope between points where elevations are given or between such points and existing finished grades.
- 3.02 **GRASSING OPERATIONS:**
- A. **The preparation of grassed areas** shall not start until immediately preceding the season for seeding, except that topsoil may be spread at the option of the Design/Builder provided that it is thoroughly loosened to its full depth and brought to a friable, mellow condition before the seed bed is further prep
 - B. **The preparation of subgrade soil:** The subgrade of all grassed areas is required to be established as called for when subgrade soil is loosened to a depth of 4" and graded to remove all ridges and depressions. The subgrade shall be parallel to the finished grade. All stones over 2" in any dimension, sticks, rubbish or other debris shall be removed. After the preparation of the subgrade soil for lawn areas is finished, no heavy objects except lawn rollers shall be taken over the areas at any time unless the subgrade is adequately protected in a manner approved by the Owner.
 - C. **Placing topsoil:** The topsoil shall be uniformly distributed on the areas designated to be topsoiled and seeded, in sufficient depth to compensate for any shrinkage, so that the average thickness of the compacted topsoil shall be not less than 6". Any irregularities in the surface resulting from topsoiling or other operations thereon shall be corrected to prevent the formation of depressions where water will stand. Topsoil shall not be placed when the topsoil or subgrade is frozen, excessively wet, extremely dry or in a condition which would be detrimental to the topsoiling and seeding operations. Topsoiling shall be performed only when it can be followed within a reasonable time by seeding.
 - D. **Preparation of seed bed:** Before starting work, approved types of equipment shall be on hand and it shall be demonstrated that the application of lime, fertilizer, chlordane and seed will be made at the specified rates.
 - a. **Fine grading:** The surface shall be brought to the required finished grades, free of ridges and depressions, through successive stages of light rolling, fine grading and raking operations. The surfaces shall be cleared of all stones, roots, stumps, weeds, objects larger than 1" in diameter and other material which would be a hindrance to planting operations or to plant growth.

- b. Application of lime, chlordane and fertilizer shall be completed as specified below. Quantities given are minimum. Each material shall be thoroughly incorporated in the top 4" of the surface. Application shall be made at least 2 days before seed is sown and the area shall be thoroughly watered unless same is accomplished by rainfall.
 - (1) Lime - 100 pounds per 1,000 square feet.
 - (2) Fertilizer - 30 pounds per 1,000 square feet.
 - (3) Superphosphate - 15 pounds per 1,000 square feet.
 - c. Finish grading shall be obtained by removing high and low spots and removing stones and objectionable objects from the surface to produce a firm level finely pulverized seed bed.
 - d. Sowing seed: No seeding shall be permitted after a rain unless the surface of the ground is loosened, or when the velocity of the wind exceeds a gentle breeze of about 5 miles per hour. Prior to seeding a light application of fertilizer (10-10-10) shall be applied at the rate of 5 to 10 pounds for each 1000 feet. Seed shall be sown openly at the rate of 5 pounds per 1,000 square feet and lightly raked into the surface to a depth of 1/4". Extreme care shall be exercised during the seeding and raking so that no change in grade is made and so that the seed is not raked from one spot to another. The area shall then be lightly rolled and thoroughly watered with a fine spray.
- 3.03 PROTECTION: All seeded areas shall be adequately protected at all times against traffic, trespassing or other operations and from damage of any kind by erecting barricades or by other approved methods. The Design/Builder shall repair all damage to seeded areas, at no additional expense to the Owner.
- 3.04 PLANTING SEASON: The season for the planting of lawns shall be from April 1 to June 15, and August 15 to September 25, except as such times therein as the Owner may consider inadvisable because of weather or other conditions and except as otherwise herein specified. In the event that seasonal and other conditions permit and upon approval of the Owner, seeding may start earlier and shall be started on all areas during the first planting season after the subgrade has been established. The preparation of lawn areas may begin prior to the specified planting season provided the subgrade has been established and approved, and provided that, in the judgment of the Owner, the general construction work is sufficiently advanced.
- A. Attention is called to the fact that certain grading operations are required to be done under Section 31 23 00, Earthwork, before the work under this section can proceed. These operations include all cutting, filling, backfilling and grading necessary to bring all subgrades for lawn areas to the required depth below proposed final grades.
- a. Subgrade elevations shall be understood to be at the specified depths below the proposed final grades shown on the Drawings or specifications.
 - b. Finished grades shall be understood to be proposed final grades shown on the Drawings or specifications. Where final grades are not indicated finished grades shall be of uniform level of slope between points for which elevations are given or between such points and existing grades.

- 3.05 CLEAN-UP: The Design/Builder shall leave each area neat and clean. Any paved area over which hauling operations are conducted shall be kept clean and any topsoil or other material which may be brought upon paved surfaces shall be promptly removed.
- 3.06 FINAL INSPECTION AND ACCEPTANCE: The work of grassed areas will be subject to the acceptance of the Owner upon the completion of all work of this Section, including maintenance.
- 3.07 SLOPE EROSION PROTECTION: All grassed slopes 2:1 or greater shall be covered with Dutch type burlap material after seeding operations are completed. Burlap shall be secured to ground with wood pegs 5'-0" o.c. each direction.

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NEW TOWN HALL
(Formerly Kendall Dean School)

**NARRATIVE REPORT
OF
MECHANICAL, ELECTRICAL AND PLUMBING SYSTEMS**



I. MECHANICAL

A. Mechanical Observations

1. Heating: The heating in the building consist of a new gas fired high efficient hot water boiler. The boiler was recently installed along with new controls, piping, venting and pumps. The spaces throughout the buildings are being heated by cast iron radiators converted from the original steam system to hot water. Certain areas are being heated via electric baseboard. The existing piping and radiators are original to the building and are beyond their life expectancy. In addition, the interior of the piping and radiators will have scale build-up and corrosion due to the lack of chemical treatment over the years. The scale and debris in the piping may damage the new boiler and pumps. A new heating hot water loop and new fin-tube radiation and enclosure were installed in the Auditorium.
2. Cooling: The spaces are being cooled by individual window air conditioners.
3. Ventilation: There is no mechanical ventilation in the building. The original ventilation system has been deactivated. The individual shafts going up the attic space ductwork system have been sealed.
4. Controls: The building has standalone controls. The boiler has a new controls supplied by the manufacture. The radiators have none electric zone valves at each unit.

B. Mechanical Recommendations

1. Heating:
 - The existing cast iron radiators and piping shall be replaced with new fin-tube radiation, enclosure and piping.
 - Each space shall be zoned with a fin-tube radiation loop, a dedicated 24v control valve and wall thermostat.
 - Fin-tube radiation shall be typical to Sterling Model JVB-ARS with rating of 810 btu/ft.

2. Cooling:

- The existing window air conditioners shall be replaced with a new air conditioning system.
- Cooling for other spaces in the first floor and basement:
Option-1: Provide a new variable refrigerant flow heat pump system (VRF).
Option-2: Provide new DX split system for spaces requiring cooling.
- Each space to be cooled shall receive a ductless ceiling or wall mounted unit. New refrigerant and condensate piping shall be installed per manufactures instructions. Contractor shall limit exposed refrigerant and condensate piping by routing through inside of new walls, ceilings and soffits. PVC jacket shall be installed on all exposed refrigerant piping. Units shall be sized at 36 btus/sf for each space.
- The Chamber room may be cooled by a roof top unit and new ductwork. The roof top unit shall be an 8.0 ton York model J08ZJN12D2B1BAA2A1. New ductwork shall be lined for acoustic attenuation.

3. Ventilation:

- A new energy recovery ventilation unit shall be installed in attic space. The exhaust may be ducted to the existing roof vent. The existing round window in the attic may be used for air intake with the use of a new round wall louver. The unit shall enter the attic space by removing the existing round vent louver located in front of the building.
- The existing duct risers from the attic to the first floor shall be used to serve each floor and space. The existing ductwork to be re-sued shall be sealed air tight and thoroughly cleaned by a duct cleaning contractor prior new ductwork connections.
- A new supply and exhaust duct shall be routed to the basement and to each space. The crawl spaces, server room, bathrooms, storage rooms shall be exhausted. All other spaces shall be supplied with outdoor air.
- A new energy recovery ventilation (ERV) unit with heating and cooling shall be installed on roof. All new ductwork in the attic space shall be wrapped with R-8 insulation.
- The new supply ventilation ductwork serving each floor shall have a dedicated diffuser to each space.
- The new ERV shall be sized at 1600 CFM @ 1.25 ESP manufactured by Greenheck model ERV-20-15. An electric coil shall be installed on the supply duct sized at 8.0 kW manufactured by Greenheck model IDCH.
- This system will exhaust all the toilet rooms, mechanical rooms and storage rooms while introducing outdoor ventilation air to each occupied space.

4. Controls: A new open source Tridium based direct digital control (DDC) Building Management System (BMS) shall tie the entire mechanical system together. The BMS will allow the owner to monitor and control the building remotely via a web base program. The BMS will also be capable to tie into the town Control Facility Control Management System.

II. ELECTRICAL

A. Existing Electrical Systems

1. The existing electric service originates on a utility pole located on the northeast side of the building. The overhead service is attached to the building just under the roof level down to a meter on the outside of the building at the basement level. A 400 amp main disconnect is located inside the basement as the service enters the building. The service is 400 amps at 120/240 volts, single phase, three wire. The disconnect is located in a former classroom. The service feeds a trough in the basement boiler room. There are two 200 amp circuit breakers that feed the boiler room panel and a new panel "B" located on the 2nd floor. There are fused panelboards located on each floor that feed the original recessed receptacles. Panel "B" feeds window air conditioning units and added receptacles on the first and second floors.
2. Lighting is predominantly lensed pendant wraparounds utilizing T12 lamps and magnetic ballasts. Emergency lighting is served by emergency battery units located throughout the building. The basement mechanical area has incandescent RLM type fixtures.
3. General receptacles are located throughout the building to serve classrooms and offices. New receptacles fed from panel "B" are fed with surface mounted EMT conduit and boxes.
4. The Fire Alarm System is a conventional 4 zone hard wired system. A radio master box is connected to the panel for central station notification.
5. The building is equipped with a fiber optic data line and a copper telephone service. The telephone demark is located in a second floor classroom.

B. Electrical Recommendations

1. Provide a new 600 amp 120/208 volt, three phase, 4 wire electric service to support the new construction and elevator. Since only single phase power is available, three phase overhead lines will need to be extended from approximately 500 feet away. Provide a new utility riser pole and padmount transformer. Provide a new 600 amp distribution panel (MDP). This panel will be fed from a new 175 kW generator. The MDP will feed two new transfer switches, one new 100 amp life safety transfer switch and one 600 amp standby transfer switch. The 600 amp ATS will feed panel DP. New circuit breakers will be provided mounted on the generator for each transfer switch. New panels connected to the DP will feed both transfer switches, panels LS 100Amp, PB 100 amp, MP 400 amp, P1 100 amp, P2 100 amp, RP3 125 amp. All of the panels will be housed in the existing basement.
2. New lighting will be pendant mounted linear LED lighting fixtures. Lobby areas will have LED downlights. All offices, restrooms etc. will have automatic lighting controls. Corridor areas will have manual switch controls.
3. Remove existing fused panelboards and wiring. Provide new panels on each floor to power additional surface mounted receptacles. Provide blank cover plates over existing junction boxes. A back box, conduit to above accessible ceiling and pull string will be provided for all additional tel/data outlets.

4. The existing fire alarm system will be replaced. The system will remain active through the construction process. Existing devices will be removed completely after the new system is installed.
5. Existing telephone and fiber optic equipment will be reused.

III. PLUMBING

A. Plumbing Observations:

1. Domestic Water: The existing 2-inch domestic water service enters at the north side of the building at the basement level in the Existing Men's bathroom. The domestic water service consists of a 2-inch service main, water meter and 2-inch copper supply main. The domestic water copper piping appeared to be in fair condition, original to the building with some modifications made over the years. The existing domestic water supply piping shall be removed and updated as required to accommodate the new domestic water plumbing demand for the entire building.
2. Domestic Hot Water: Domestic hot water for the existing plumbing fixtures is provided a standard efficiency A.O. Smith 20-gallon electric storage water heater. The water heater appeared to be in fair condition and shall be removed due to updated domestic hot water demand.
3. Sanitary Waste & Vent: The existing sanitary waste and vent system consists of a mixture of hub and spigot cast iron, hubless cast iron, copper and PVC piping. The existing 4-inch sanitary waste piping connects to an underground main exiting at the southeast side of the building in the basement level. The existing 4-inch sanitary vent piping connects to multiple 4-inch vents through roof. The existing sanitary hub & spigot cast iron and copper piping appeared to be in fair condition with modifications made over the years. The existing sanitary waste and vent supply piping shall be removed and updated as required to accommodate the new sanitary plumbing demand for the entire building.
4. Storm (Roof) Drainage: The existing storm drainage system consists of exterior gutters and downspouts. The existing downspouts drain to splash blocks on grade. No new internal roof drains and storm drainage system is required.
5. Fuel Gas: The existing natural gas service enters at the east side of the building and into the Existing Mechanical room. It consists of a 1-inch elevated pressure service main, pressure regulator, meter and 2-inch low pressure supply main. The exterior natural gas steel piping and fittings were in good condition and showed minor signs of rusting. The interior gas piping appeared to be in good condition. The existing natural gas system supplies the existing boiler and rooftop unit.
6. Plumbing Fixtures: Existing plumbing fixtures consist of floor mounted flush valve water closets, floor mounted tank type water closets, wall hung lavatories, wall hung

flush valve urinals, counter mounted sinks, wall hung sink, service sinks, wall hung drinking fountains, floor drains and wall hydrants. Existing plumbing fixtures appeared to be in fair condition. Existing plumbing fixtures indicated to be removed in the architectural drawings shall be demolished in their entirety.

B. Plumbing Recommendations:

1. Domestic Water: A new 2-inch reduced pressure zone backflow preventer shall be installed after the water meter. The existing domestic water supply piping shall be revised to accommodate the new domestic plumbing demand for the renovated areas of the building.
2. Domestic Hot Water: Domestic hot water shall be generated by a new indirect domestic hot water storage tank with associated circulation pump and accessories fed off of the existing heating boiler system located in the Mechanical Room B02. The new vertical storage tank shall be equal to Viessmann Vitocell 300 79 gallon tank. The renovated domestic hot water system shall serve each fixture that requires hot water and shall have a ¾-inch continuous domestic hot water return line with recirculation pump equal to Taco model 005 back to the water heating system. A master thermostatic mixing valve equal to Symmons model 7-200 shall be located adjacent to the water heaters to ensure hot water temperatures are set at 120°F. A new 1½-inch domestic hot water main shall be installed and run to all new and existing plumbing fixtures requiring domestic hot water.
3. Domestic Water Piping: All aboveground domestic water piping shall be Type L copper tube with wrought copper fittings and 95/5 solder. All buried domestic water piping shall be Type K copper with cast brass fittings and silver solder joints. All domestic water piping shall be covered with molded fiberglass insulation with vapor barrier all service jacket and PVC fittings.
4. Sanitary Waste & Vent: The existing sanitary waste and vent supply piping shall be removed and revised as required to accommodate the new sanitary plumbing demand for the entire building. All new 4-inch sanitary waste lines shall connect to the existing 4-inch underground sanitary waste exit at the basement. All new 4-inch sanitary vent mains shall connect to the existing 4-inch vents through roof.
5. Sanitary Waste & Vent Piping: All buried sanitary waste piping shall be service weight bell and spigot cast iron with neoprene resilient gaskets. Buried sanitary waste piping through foundation wall shall be heavy duty bell and spigot cast iron with lead and oakum joints. All above floor sanitary waste piping shall be hubless service weight cast iron with stainless steel mechanical couplings. All above floor sanitary waste piping 2-inches and smaller shall be Type DWV hard drawn seamless copper with wrought copper drainage fitting joints with 95/5 solder.
6. Fuel Gas: The existing 2-inch natural gas supply piping shall be revised to accommodate any new gas-fired equipment demand. All new above ground natural gas piping shall be schedule 40 carbon steel with threaded malleable iron fittings or

welded, as required by code. All existing exterior gas piping shall be sanded and painted with two (2) coats of rust-inhibitive paint.

7. Plumbing Fixtures: New plumbing fixtures in the renovated building shall consist of the following:
- Wall mounted flush valve water closets – American Standard model 2856.128 bowl & American Standard model 6047.121.002 flush valve
 - Wall hung lavatories – American Standard model 0356.421 sink & Chicago model 3501-E2805ABCP faucet
 - Counter mounted stainless steel sinks – Elkay model LRAD291865 & Symmons model SPP-3510-1.5 faucet
 - Wall mounted electric water coolers with bottle fillers – Halsey Taylor model HTHB-HACG8SS-WF
 - Service sink – Fiat model MSB2424 & Chicago 540-LD897SGCCP faucet
 - Hose bibbs – J.R. Smith model 5670-H-CP
 - Wall hydrants – J.R. Smith model 5509QT-WC-CP
 - Floor drains – J.R. Smith model 2005Y-A-NB-B for 2-inch & model 2010Y-A-NB-B for 4-inch.

All new flush valves and faucets shall be manual low-flow type fixtures. ADA compliant and barrier-free plumbing fixtures shall be installed as required by Code. Refer to architectural drawings for locations of all new plumbing fixtures.

POLICE HEADQUARTERS RENOVATIONS

(Formerly Bushee School)

NARRATIVE REPORT OF MECHANICAL, ELECTRICAL AND PLUMBING SYSTEMS



BUILDING ENGINEERING RESOURCES, INC.

I. MECHANICAL

A. Mechanical Observations:

1. Heating: The existing heating in the building consist of a new gas fired high efficient hot water boiler. The boiler was recently installed and appears to be in good working condition. The piping and pumps are still original to the system. The spaces throughout the buildings are being heated by fin-tube radiation.
2. Cooling: The original building is being cooled by packaged roof top unit. The units appear to be in good working condition. Some spaces in the Police Annex portion of the building are being cooled by individual window air conditioners.
3. Ventilation: The first floor has no mechanical ventilation. The basement level is ventilated by a 100% air handling unit located in the electrical room.
4. Controls: The building has a combination of standalone controls and Johnson Control Building Management System tied to the town Facility Control Management System. The boiler has a new controls supplied by the manufacture.

B. Mechanical Recommendations:

1. Heating:
 - The existing fin-tube radiation and enclosure serving renovated spaces shall be modified or replaced as required to fit new space layout and zoning.
 - Each space shall be zoned with a fin-tube radiation loop, a dedicated 24v control valve and wall thermostat.
 - Fin-tube radiation shall be typical to Sterling Model JVB-ARS with rating of 810 btus/ft. Security spaces shall be typical to Sterling Model GSBS-12P.
 - The combustion air for the existing boiler shall be reconfigured and re-ducted to the mechanical room. A new motorized damper shall be provided and interlocked with the existing boiler.

2. Cooling:
 - The four (4) roof top units shall remain for the police section of the first floor. The existing ductwork shall be revised as required to serve the new space layout.
 - Cooling for other spaces in the first floor and basement:
 - Option-1: Provide a new variable refrigerant flow heat pump system (VRF).
 - Option-2: Provide new DX split system for spaces requiring cooling.
 - Each space to be cooled shall receive a ductless ceiling or wall mounted unit. New refrigerant and condensate piping shall be installed per manufactures instructions. Units shall be sized at 30 btus/sf for each space.
3. Ventilation:
 - The existing make-up air unit and exhaust fan serving the basement shall be removed and disposed of.
 - A new energy recovery ventilation (ERV) unit with heating and cooling shall be installed on roof. All new ductwork in the attic space shall be wrapped with R-8 insulation.
 - The new system will exhaust all the toilet rooms, mechanical rooms and storage rooms while introducing outdoor ventilation air to each occupied spaces in the 1st floor and basement.
 - The new supply ventilation ductwork shall be tied to the return ductwork of the roof top units serving the 1st floor.
 - The new supply ventilation ductwork serving the basement shall have a dedicated diffuser to each space.
 - The new ERV shall be sized at 1700 CFM @ 1.0 ESP manufactured by Greenheck model ERCH-20-30L-4P-IG-01.
 - The evidence room shall be exhaust by a dedicated roof exhaust fan sized for 300 CFM at 0.5 ESP manufactured by Greenheck model G-080.
4. Controls: A new open source Tridium based direct digital control (DDC) Building Management System (BMS) shall tie the entire mechanical system together. The BMS will allow the owner to monitor and control the building remotely via a web base program. The BMS will also be capable to tie into the town Control Facility Control Management System.

II. ELECTRICAL

A. Existing Electrical Systems:

1. The existing electric service originates on a utility pole located on the north side of Smithfield Road. The overhead service crosses the road to a secondary utility pole, then drops underground to the building. The service enters the electric room at the floor where the utility meter and main distribution panel is located. The service is 400 amps at 120/208 volts, three phase, four wire. The service feeds panels on the town offices side and the police side on the first floor.

2. A generator is used to provide standby power for select lighting fixtures and standby loads. Panels are located on the town offices side and the police side on the first floor.
3. Lighting is predominantly lensed pendant wraparounds utilizing T8 lamps and electronic ballasts on the town office side of the building. The police side has mostly more recent recessed 2x2 fixtures. The gym area has original surface mounted wraparound. Emergency lighting is served by normal lighting fixtures connected to the emergency generator.
4. General receptacles are located throughout the building to serve offices. The town offices do not have an adequate receptacles. Extension cords and plug strips are often used.
5. The Fire Alarm System is a conventional 8 zone hard wired system. A radio master box is connected to the panel for central station notification.
6. The building is equipped with a fiber optic data line and a copper telephone service. The telephone demark is located in the main electric room.

B. Electrical Recommendations:

6. New lighting will be pendant mounted linear and recessed LED lighting fixtures. . All new offices, restrooms etc. will have automatic lighting controls. Corridor areas will have manual switch controls.
7. The existing 400 amp service shall remain. The existing service is 120/208 Provide a new 400 amp distribution panel (DP). This panel will be fed from the 125 kW generator and the existing 400 amp MDP. The DP will feed two new transfer switches, one for a new 100 amp life safety transfer switch and one for the 400 amp standby transfer switch. New circuit breakers will be provided mounted on the existing generator for each transfer switch. New panels connected to the DP will feed both transfer switches, panels LS 125Amp, MP 250 amp, RP1 250 amp, RP2 125 amp, RP3 125 amp. Existing panels to be re-fed are LA 150 amp, ELA 70 amp.
8. Provide new panels and receptacles in the basement renovated areas. Replace existing panelboards on the first floor and reconnect all existing circuits. Provide a back box, conduit to above accessible ceiling and pull string will be provided for all additional tel/data outlets. Provide new outlets/tel data outlets for renovated areas.
9. Demolition will be required in all areas on a phased approach. Some temporary work will be required to bridge phases.
10. The existing fire alarm system will be replaced. The existing system will remain active through the construction process. Existing devices wiring and conduit will be removed completely after the new system is installed.
11. Existing telephone and fiber optic head end equipment will be reused.

III. PLUMBING

A. Plumbing Observations:

1. Domestic Water: The existing domestic water supply consists of two (2) separate supplies: one (1) municipal water supply and one (1) well water supply. The existing municipal domestic water service enters the north side of the building at the ground floor level from the municipal street main. The municipal domestic water service consists of a 1½-inch service main, water meter and 1½-inch copper supply main. The existing well domestic water service enters the southeast side of the building at the ground floor level from a well located onsite. The well domestic water service consists of a 1-inch service main, well expansion tank and 1-inch copper supply main. Both domestic water supplies appear to be interconnected inside of the building. The domestic water copper piping appeared to be in good condition, original to the building with some modifications made over the years. The existing domestic water supply piping shall be removed and updated as required to accommodate the new domestic water plumbing demand for the entire building.
2. Domestic Hot Water: Domestic hot water for the existing plumbing fixtures is provided by a standard efficiency A.O. Smith 40-gallon gas fired storage water heater. The water heaters and tank appeared to be in good condition and shall be removed due to updated domestic hot water demand.
3. Sanitary Waste & Vent: The existing sanitary waste and vent system consists of a mixture of hub and spigot cast iron, hubless cast iron, copper and PVC piping. The existing sanitary waste piping connects to a 6-inch main exiting at the north side of the building. The existing 4-inch sanitary vent piping connects to multiple 2-inch and 4-inch vents through roof. The existing sanitary hub & spigot cast iron and copper piping appeared to be in fair condition with modifications made over the years. The existing sanitary waste and vent supply piping shall be removed and updated as required to accommodate the new sanitary plumbing demand for the entire building.
4. Storm (Roof) Drainage: The existing storm drainage system consists of internal roof drains, hub and spigot cast iron and hubless cast iron piping. Two (2) existing storm drainage pipe mains exit at the ground floor level at the south side of the building. The existing storm drainage hub & spigot cast iron and copper piping appeared to be in fair condition with modifications made over the years. The existing roof drains appeared to be in good condition.
5. Fuel Gas: The existing natural gas service enters at the east side of the building. It consists of a ¾-inch elevated pressure service main, pressure regulator, meter and 1½-inch low pressure supply main. The exterior natural gas steel piping and fittings appeared to be in fair condition and showed signs of rusting. The interior gas piping appeared to be in good condition. The existing natural gas system supplies the existing boiler and domestic water heater. The existing gas piping serving the existing water heater to be demolished shall be removed.

6. Plumbing Fixtures: Existing plumbing fixtures consist of floor mounted flush valve water closets, wall hung lavatories, wall hung flush valve urinals, counter mounted sinks, shower enclosures with valve systems, institutional/cell water closets, service sink, wall hung drinking fountains, floor drains and wall hydrants. Existing plumbing fixtures appeared to be in fair condition. Existing plumbing fixtures indicated to be removed in the architectural drawings shall be demolished in their entirety. Existing plumbing fixtures indicated to be remain in the architectural drawings shall remain and be cleaned and disinfected.

B. Plumbing Recommendations:

8. Domestic Water: A new 1½-inch reduced pressure zone backflow preventer shall be installed after the water meter at the municipal water service. The existing 1½-inch domestic water supply piping shall be revised to accommodate the new domestic plumbing demand for the renovated areas of the building.
9. Domestic Hot Water: Domestic hot water shall be generated by a new indirect domestic hot water storage tank with associated circulation pump and accessories fed off of the existing heating boiler system located in the Mechanical Room B8. The new vertical storage tank shall be equal to Viessmann Vitocell 300 79 gallon tank. The renovated domestic hot water system shall serve each fixture that requires hot water and shall have a ¾-inch continuous domestic hot water return line with recirculation pump equal to Taco model 005 back to the water heating system. A master thermostatic mixing valve equal to Symmons model 7-200 shall be located adjacent to the water heaters to ensure hot water temperatures are set at 120°F. A new 1½-inch domestic hot water main shall be installed and run to all new and existing plumbing fixtures requiring domestic hot water.
10. Domestic Water Piping: All aboveground domestic water piping shall be Type L copper tube with wrought copper fittings and 95/5 solder. All buried domestic water piping shall be Type K copper with cast brass fittings and silver solder joints. All domestic water piping shall be covered with molded fiberglass insulation with vapor barrier all service jacket and PVC fittings.
11. Sanitary Waste & Vent: The existing sanitary waste and vent supply piping shall be removed and revised to accommodate the new sanitary plumbing demand for the entire building. All new 4-inch sanitary waste lines shall connect to the existing 6-inch underground sanitary waste exit at the basement. All new 4-inch sanitary vent mains shall connect to the existing 4-inch vents through roof. All existing 2-inch vents through the roof serving fixtures to be demolished shall be removed.
12. Sanitary Waste & Vent Piping: All buried sanitary waste piping shall be service weight bell and spigot cast iron with neoprene resilient gaskets. Buried sanitary waste piping through foundation wall shall be heavy duty bell and spigot cast iron with lead and oakum joints. All above floor sanitary waste piping shall be hubless service weight cast iron with stainless steel mechanical couplings. All above floor

- sanitary waste piping 2-inches and smaller shall be Type DWV hard drawn seamless copper with wrought copper drainage fitting joints with 95/5 solder.
13. Storm (Roof) Drainage: The existing storm drainage supply piping shall be revised as required to accommodate the new architectural layouts.
14. Fuel Gas: The existing 1½-inch natural gas supply piping shall be revised to accommodate any new gas-fired equipment demand. All new above ground natural gas piping shall be schedule 40 carbon steel with threaded malleable iron fittings or welded, as required by code. All existing exterior gas piping shall be sanded and painted with two (2) coats of rust-inhibitive paint.
15. Plumbing Fixtures: Existing plumbing fixtures indicated to be remain in the architectural drawings shall remain. New plumbing fixtures in the renovated building shall consist of the following:
- Wall mounted flush valve water closets – American Standard model 2856.128 bowl & American Standard model 6047.121.002 flush valve
 - Floor mounted flush valve water closets – American Standard model 2854.128 bowl & American Standard model 6047.121 flush valve
 - Floor mounted tank type water closets – American Standard model 215AA.104
 - Counter mounted lavatories – American Standard model 0495.221 sink & Chicago model 3501-E2805ABCP faucet
 - Wall hung urinals – American Standard model 6590.501 urinal & American Standard model 6045.051 flush valve
 - Shower enclosures with valve systems – Aquatic 1363BFSC enclosure & Symmons model C-96-500-B30-V-X-1.5 valve system
 - Counter mounted stainless steel sinks – Elkay model LRAD221965 & Symmons model SPP-3510-1.0 faucet
 - Wall hung combination institutional lavatories & water closets – Metrcraft model HET3155-X-HC fixture & Sloan model 952-1.28 flush valve
 - Service sink – Fiat model MSB2424 & Chicago 540-LD897SGCCP faucet
 - Hose bibbs – J.R. Smith model 5670-H-CP
 - Wall hydrants – J.R. Smith model 5509QT-WC-CP
 - Floor drains – J.R. Smith model 2005Y-A-NB-B for 2-inch & model 2010Y-A-NB-B for 4-inch.

All new flush valves and faucets shall be manual low-flow type fixtures. ADA compliant and barrier-free plumbing fixtures shall be installed as required by Code. Refer to architectural drawings for locations of all new plumbing fixtures.

END OF MEP NARRATIVE