



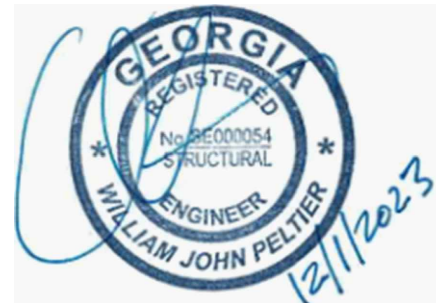
855 Abutment Road
Suite Four
Dalton, GA 30721
706.529.5895

New Building for:
DALTON POLICE DEPARTMENT
301 JONES ST, DALTON GA 30720

THE CITY OF DALTON, GA



GSWCC LEVEL II - 0000008686



JOB NO.: 23-021

DATE ISSUED: 12/01/23

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SECTION 00010 - REQUEST FOR PROPOSALS

THE CITY OF DALTON (the “City”), pursuant to the provisions of O.C.G.A. § 36-91-1, *et. seq.*, herein seeks competitive Proposals from contractors for the construction of: “A New Building for Dalton Police Department”, located at 301 Jones Street, Dalton GA 30720 (the “Project”).

In general, the project includes the construction of a two story, free-standing addition to the existing building. Trades include concrete masonry load-bearing walls, brick and block veneer, composite metal panels, lay-in celinigs, LED lighting, light gage metal trusses and standing seam metal roof, site work, and all other materials & labor required for a complete project. The requirements for construction of the Project, and the duties and responsibilities of the contractor whose Proposal is accepted (“Successful Contractor”), are set forth in the Contract Documents which include the Instructions to Proposers; the Contract for Construction and Incorporated General Conditions (the “Contract”); any supplementary and other conditions; the drawings; the specifications; and any addenda issued by the Architect.

Any contractor submitting a Proposals must register with the City’s Vender Registry and download complete set of the Contract Documents.

Vender Registry is posted here: <https://www.daltonga.gov/finance/page/vendor-packets> .

Open Solicitations are posted here: <https://www.daltonga.gov/rfps> .

The Contractor is solely responsible for obtaining any addenda or further correspondence from the procurement website for this solicitation.

All documents are available for inspection by the public at the Architect’s office at 855 Abutment Road Suite 4 Dalton, GA 30721. The Contract Documents require, among other things, the furnishing of all materials, labor, and equipment for construction of the Project. The City reserves the right to make available other relevant documents or information concerning the Project.

Any Contractor who intends to submit a Proposal is required to attend a Pre-Proposal Meeting, which will be held on the 19th day of March 2024, at 2:00 p.m. at the project site. The meeting will be held in the training room in the existing police department building. Arrive early and check in at the front desk. Any contractor arriving more than 5 minutes late will not be permitted to attend.

A Proposal must strictly comply with all requirements set forth in the Instructions to Proposers. A Proposal must contain the completed Proposal Form which sets forth the Contractor’s proposed lump sum contract price for full and complete construction of the Project in conformity with all requirements of the Contract Documents. A Proposal must also include the Contractor’s responses to all questions, and a fully executed Bid Bond in the amount of five percent (5%) of the proposed lump sum contract price (exclusive of any alternates and unit prices) in the form required by the Instructions to Proposers.

Any contractor who intends to submit a Proposal is required to visit the Project Site and familiarize itself with the local conditions under which the required work is to be performed and include in its lump sum cost all necessary expenses required to perform and complete the Project.

In evaluating Proposals, the City may seek additional information from any contractor concerning such contractor’s Proposal or its qualifications to construct the Project.

The City intends to award the construction contract to the responsible and responsive contractor whose Proposal is determined in writing to be the most advantageous to the City, take into consideration the following evaluation factors which are listed below:

- A. General Background / Firm History (5 Points)
- B. Financial Status and Bonding (5 Points)
- C. Proposed Project Personnel (15 Points)
- D. Company Experience (25 Points)
- E. Legal Proceedings (5 Points)
- F. Project Specific Approach (10 Points)
- G. Project Specific / Company Safety Plan. (5 Points)
- H. The Contractor's proposed lump sum fee (25 Points).
- I. The completeness and accuracy of proposal. (5 Points)

Sealed proposals will be received by the City of Dalton Finance Department located at 300 W. Waugh Street, Dalton, Georgia 30720 until: 2:00 p.m. on the 2nd day of April 2024. All proposals must be sealed and plainly marked "New Building for Police Department". A total of **2** proposals in bound notebooks are required. Please tab each section/form individually. Any Proposal received after said time will not be accepted. At the discretion of the City and in conformity with the applicable laws of the State of Georgia, the City may afford contractors an opportunity for subsequent discussion, negotiation, and revision of Proposals. The City reserves the right to reject any or all Proposals and to waive any technicalities or formalities.

Any proposal must include an executed E-Verity Affidavit, Exhibit I. Proposals not including executed E-verify affidavit will be automatically rejected.

Each Contractor is responsible for ensuring its Proposal complies with Georgia law, including but not limited to all state and local laws, rules, regulations, ordinances, and policies. Each Proposal must include an affidavit meeting all requirements of O.C.G.A. § 13-10-91, verifying compliance with applicable Federal work authorization program. The form for such affidavit is attached as an exhibit to the Instructions to Proposers.

Contractors understand and agree that the Proposal it submits to the City for consideration shall remain open for acceptance by the City and same shall be honored by the contractor, for a period of sixty (60) days from the date set forth hereinabove for the receipt of Proposals.

Contractor must have minimum Worker's Compensation and General Liability Insurance in full force and effect and submit evidence of such insurance policy to the satisfaction of the City. The City will not consider any Proposal that is not accompanied by satisfactory evidence that the contractor holds any and all necessary or required Federal, State, or local licenses and/or permits. The City's acceptance of any such evidence of the applicable insurance policy or licenses or permits does not alter or change a contractor's responsibility to comply with such specifications. Pursuant to O.C.G.A. § 13-10-91, all contractors and sub-contractors performing work within the State of Georgia in accordance with or related to a contract with a public employer must register and participate in a federal work authorization program. The contractor shall provide certification of such registration and participation in a Federal work authorization program to the City. Each contractor shall submit with its Proposal a copy of its current Business License and/or Occupational Tax Certificate issued in the state in which the Contractor resides. If a contractor cannot provide such license, it will be required to obtain one from the City of Dalton / Whitfield County if it is awarded the construction contract for the Project.

End – Request for Proposals

SECTION 00030 CONTRACTOR'S QUALIFICATIONS / INSTRUCTIONS

NAME OF PROJECT: **A NEW BUILDING FOR:
DALTON POLICE DEPARTMENT**

NAME OF OWNER: **CITY OF DALTON, GA**

THE CITY OF DALTON (the "City"), pursuant to the provisions of O.C.G.A. § 36-91-1, *et. seq.*, herein seeks competitive Proposals from contractors for the construction of: "A New Building for Dalton Police Department", located at 301 Jones Street, Dalton GA 30720 (the "Project"). Said Request for Proposals, as issued on 2/15/2024, is incorporated herein by reference.

INSTRUCTIONS

- (1). The Owner, the City of Dalton, (hereinafter "City"), its agents and representatives, shall be entitled to contact each and every reference listed in response to this questionnaire, and each entity referenced in any response to any question in this questionnaire. The Contractor, by completing this questionnaire, expressly agrees that any information concerning the Contractor in possession of said entities and references may be made available to the City.
- (2). Only complete and accurate information shall be provided by the Contractor. The Contractor hereby warrants that, to the best of its knowledge and belief, the responses contained herein are true, accurate, and complete. The Contractor also acknowledges that the City is relying on the truth and accuracy of the responses contained herein. If it is later discovered that any material information given in response to a question was provided by the Contractor, knowing it was false, it shall constitute grounds for immediate termination or rescission by the City of any subsequent agreement between the City and the Contractor. The City shall also have and retain any other remedies provided by law.
- (3). All Questions shall be submitted to the City in writing and submitted by email to: Captain Barry Woods bwoods@daltonga.gov . Copy the project Architect, Kenneth Harless kharness@krharchitects.com . All questions must be received by the City no later than five (5) business days prior to the hour set to receive proposals. All questions will be answered in writing and included in the addenda. Any changes, additions, interpretations, or corrections, to or concerning the Contract Documents prior to the date for submission of Proposals will be issued as an Addendum by the Architect on the City's Procurement Website at the address listed above. Only such written changes, additions, interpretations, or corrections by Addendum shall be binding. Any changes, additions, interpretations, or corrections given by any other method shall not be valid and the Contractor shall not rely upon in any manner whatsoever any verbal statements, instructions, interpretations, corrections, or other information provided by the City or the Architect or their representatives. **The Contractor is solely responsible for obtaining any addenda or further correspondence from the procurement website for this solicitation.**
- (4). The Architect will give consideration, prior to submission of Proposals, to requests for approval of products similar to those specified by proprietary names provided only that such requests comply with the following provisions:

- All requests for substitution must be written and delivered to the office of the Architect at least fourteen (14) calendar days prior to the date required for the submission of Proposals;
 - Any requests for substitution must identify the product for which substitution is requested by brand name and/or catalog number, together with Section and Article number where specified, and must identify in similar manner the proposed substitution;
 - Any requests for substitution must explain fully the difference, if any, between the proposed substitution and products specified, including but not limited to, physical color, function, and guarantee considerations;
 - Any requests for substitution must be accompanied by technical data, including laboratory tests, if applicable, on the proposed substitution;
 - Any requests for substitution must give complete information on changes, if any, to drawings or specifications which will be necessary or advisable if the substitution is approved;
 - Any requests for substitution must identify three (3) projects wherein the proposed substitution has been utilized and such identification must include the name, address, and telephone number of such projects' owners, architects and general contractors.
 - Separate requests shall be made for each proposed substitution save and except where multiple substitutions are related to a complete assembly, such substitutions may be addressed in a single request. The Architect will review requests for substitution submitted in accordance with the above requirements and if in the sole discretion of the Architect such substitution is in the City's interest, he will, by addendum, add the substitution to the applicable specification
- (5). The submission of a Proposal constitutes an acknowledgment and representation by the Contractor that it has visited the Project site and has familiarized itself with the local conditions under which the required Work is to be performed and constitutes a representation by the Contractor that it has studied and examined the Contract Documents and such other information as may have been furnished by the City or the Architect. Furthermore, the submission of a Proposal constitutes a representation by the Contractor that it has no knowledge of any ambiguities, errors, omissions or other inaccuracies in any of the Contract Documents or material furnished by the City or Architect in connection with the Project. The response by the Contractor to this request for proposal, and its use by the Contractor, and its use by the City, shall not give rise to any liability on the part of the City to the Contractor or any third party or person. Upon submission, all Proposals shall become and remain the property of the City. The City shall have no liability arising out of the disclosure, dissemination, or publication of any Proposal or any information contained therein. At the discretion of the City, and in conformity with the applicable provisions of Georgia Law, the City may afford Contractors an opportunity for subsequent discussion, negotiation, and revision of Proposals. The City reserves the right to reject any or all Proposals and to waive any technicalities or informalities. Incomplete or irregular Proposals, and Proposals submitted without the required Bid Bond, may be rejected by the City;
- (6). Any Proposal submitted to the City shall remain open for acceptance by the City, and same shall be honored by the Contractor, for a period of sixty (60) days from the date set forth hereinabove for the receipt of Proposals. The City reserves the right to amend these Instructions, or clarify same by Addendum, within the time provided by Georgia Law. If such revisions or amendments are of such magnitude as to warrant, in the sole discretion of the City, the postponement for the date of the submission and receipt of Proposals, written notification shall be issued to any

Contractor who has notified the City in writing of its intent to submit a Proposal pursuant to the City's Request for Proposals.

- (7). Prior to commencing any Work on the Project, any Contractor selected by the City shall execute a written oath in accordance with the provisions of O.C.G.A. § 36-91-21(e) affirming that it has not prevented, or attempted to prevent, competition in connection with the submission of Proposals to the City by any means whatever nor has it prevented, or endeavored to prevent, anyone from submitting a Proposal by any means whatever nor has it caused or induced another to withdraw a Proposal for the Work in issue
- (8). The following questions are to be answered in full, without exception. Answer all information by attaching tabbed sheets into the contractor's proposal as listed below.

A. GENERAL BACKGROUND – Include response as Tab “A”

- a. Current Name and Address of Contractor:
- b. Previous Name or Address of Contractor, if any:
- c. Current President or Chief Executive Officer: Years in that Position
- d. Number of Employees:
(Permanent)
- e. Name and Addresses of Current Affiliated Companies (Parent, Subsidiary, Divisions):
- f. Any additional information about the history of the firm the contractor wishes to include.

B. FINANCIAL STATUS AND BONDING– Include response as Tab “B”

- a. Please attach Financial Statements for the past three (3) years for which they are complete. If such statements are not available, please furnish the following information:
 - 1. Last Three Fiscal Years:
 - a. Revenues (Gross)
 - b. Expenditures (Gross)
 - c. Overhead & Admin. Cost (Gross)
 - d. Profit (Gross)
 - b. Bankruptcies
 - 1. Has the Contractor, or any of its parents or subsidiaries, ever had a Bankruptcy Petition filed in its name, voluntarily or involuntarily? (If yes, specify date, circumstances, and resolution).
 - 2. Has any Majority Shareholder ever had a Bankruptcy Petition filed in his/her name, voluntarily or involuntarily? (If yes, specify date, circumstances, and resolution).
 - c. Loans

1. Is this Contractor currently in default on any loan agreement or financing agreement with any bank, financial institution or other entity? (If yes, specify details, circumstances, and prospects for resolution).
- d. Bonding
1. What is the Contractor's current bonding capacity with a contract surety company?
 2. Please identify the Contractor's surety company and the current line of bonding credit that company has extended to the Contractor.
 3. Please give the name, address, and telephone number of your current surety agent or underwriting contact.
 4. Have Performance or Payment Bond claims ever been made to a surety for Contractor on any project, past or present?
 5. If the answer to 4 (above) is yes, please describe the claim, the name of the company or person making the claim, and the resolution of the claim.
 6. In the past five (5) years, has any surety company refused to bond the Contractor on any project? (If answer is yes, specify the reasons given for such refusal, and the name and address of the surety company that refused to bond).
 7. In the past five (5) years, has any surety company refused to bond the Contractor's parent, or subsidiaries, on any project? (If answer is yes, please specify the reasons given for such refusal, and the name and address of the surety company that refused to bond).
- e. Mergers and Acquisitions
1. State whether or not the Contractor has been the subject of a corporate merger within the preceding three (3) years. If so, please identify all parties to such merger, provide the date of same, and a brief description of the transaction.
 2. State whether or not the Contractor has acquired any other companies or entities in the preceding three (3) years. If so, please identify all companies or entities acquired, provide the date of acquisition, and a brief description of the business of the company or entity acquired.

C. PROPOSED PROJECT PERSONNEL – Include response as Tab “C”

List the Name, Qualifications, and background of your proposed management team for this Project. (Include the Names and Addresses of Companies he/she has been affiliated with in the last five (5) years). Include current resumes listing relevant project experience. For purposes of this factor, the referenced projects are preferred to be no less than \$500,000 and not more than \$10,000,000 in scope. Please identify the person who will serve as the principal point of contact throughout the entire project. Provide the following information for each project along with any

additional information that would be useful to demonstrate the qualifications of the proposed personnel.

- a. Project Name and Description
- b. Location
- c. Contract Price
- d. Project Schedule – also include if the project was completed on time.
- e. Construction Delivery Type CM, Design/Build, Design/Bid/Build, etc.
- f. Owner Representative (with contact information)
- g. Design Professional (with contact information)

D. COMPANY EXPERIENCE - SIMILAR PROJECTS - Include response as Tab “D”

List projects of reasonably similar nature, scope, and duration (similar to the Owner’s Project) performed by your company in the last ten (10) years. Inclusion of at least five (5) but no more than ten (10) projects is preferred. For purposes of this factor, the referenced projects are preferred to be no less than \$500,000 and not more than \$10,000,000 in scope. Provide the following information for each project along with any additional information that would be useful to demonstrate the Contractor’s Qualifications.

- a. Project Name and Description
- b. Location
- c. Contract Price
- d. Project Schedule – also include if the project was completed on time.
- e. Construction Delivery Type CM, Design/Build, Design/Bid/Build, etc.
- f. Owner Representative (with contact information)
- g. Design Professional (with contact information)

Of the projects listed in response to Subsection (A), identify any which was the subject of a substantial claim or lawsuit by, or against, the Contractor. Please identify in your response the nature of such claim or lawsuit, the court in which the case was filed, and the details of its resolution.

E. LEGAL PROCEEDINGS - Include response as Tab “E”

a. Arbitrations

List all construction arbitration demands filed by, or against, the Contractor in the last five (5) years, and identify the nature of the claim, the amount in dispute, the parties, and the ultimate resolution of the proceeding.

b. Lawsuits

List all construction-related lawsuits (other than labor or personal injury litigation) filed by, or against, the Contractor in the last five (5) years, and identify the nature of the claim, the amount in dispute, the parties, and the ultimate resolution of the lawsuit.

c. Other Proceedings

Identify any lawsuits, administrative proceedings, or hearings initiated by the National Labor Relations Board or similar state agency in the past seven (7) years concerning any labor practices of the Contractor. Identify the nature of any proceeding and its ultimate resolution.

Identify any lawsuits, administrative proceedings, or hearings initiated by the Occupational Safety and Health Administration concerning the project safety practices of the Contractor in the last seven (7) years. Identify the nature of any proceeding and its ultimate resolution.

Identify any lawsuits, administrative proceedings, or hearings initiated by the Internal Revenue Service, or any state revenue department, concerning the tax liability of the Contractor (other than audits) in the last seven (7) years. Identify the nature of any proceeding and its ultimate resolution.

Have any criminal proceedings or investigations been brought against the Contractor in the last ten (10) years? (If the answer is yes, please attach a complete and detailed report of the facts and circumstances concerning all such proceedings or investigations with your responses to this Questionnaire)

F. PROJECT SPECIFIC APPROACH - Include response as Tab "F"

- a. Provide the Contractor's written approach to the project with a specific emphasis on scheduling. This document must include a detailed description of the contractor's approach to the completion of labor intensive or long lead items. The Contractor should denote how materials and equipment will be procured and how the project will be staffed with sufficient labor (shifts) and any other means and methods required to complete all work without delay to the project schedule.

G. COMPANY / PROJECT SPECIFIC SAFETY PLAN - Include response as Tab "G"

- a. Please describe your company's approach to project safety.

H. PROPOSAL FORM - Include forms and response as Tab "H"

- a. All Proposals must be signed by a duly authorized officer, member, or general partner (as appropriate) and dated. All blanks on the Proposal Form, (Exhibit / Tab “H”) shall be filled in and numbers shall be written in English words and in Arabic numerals where so requested. The completed Proposal shall be without interlineations, alterations or erasures. Addenda must be acknowledged where so designated and the Proposal shall include a proposed price for all Alternates and units. In the event a Contractor does not desire to make a change in its Proposal for any given Alternate, it shall so indicate by using the words “No Change”.
- b. Please list any additional information that you believe would assist the Owner in establishing your company as the most qualified firm for this project.

I. Tab “I” EVERIFY FORM – Include form and response as Tab “I”

- a. Any Proposal must include an executed E-Verify form, Exhibit I

J. BID BOND - Include forms and response as Tab “J”

- a. Any Proposal must include a fully executed Bid Bond in the form attached hereto as Exhibit / Tab “J” in the amount of five percent (5%) of the lump sum contract price (exclusive of any price for Alternates or unit prices). Required Payment and Performance Bond forms will be furnished by the Architect and are required to be submitted by the Contractor in accordance with the requirements of the Contract Documents. Such Payment and Performance Bonds shall each be in the amount of one hundred percent (100%) of the lump sum contract price as set forth in the Agreement between the Board and the Contractor;

End of Section

SECTION 00060 - REQUESTS FOR BEST AND FINAL OFFERS
(at Owner's Option)

Date :

Re: A New Building for Dalton Police Department

Dear Sir/Madam:

In conformity with the Request for Proposals issued by the THE CITY OF DALTON (the "City"), in connection with the above-referenced Project, you are invited to submit in writing your best and final offer for construction of the Project. Any such best and final offer must provide for construction of the Project in accordance with all requirements of the Contract Documents. Any such offer must be received by the City at its office located at _____ (telephone number _____) on or before _____ a.m., _____ day of _____, 2024.

Any best and final offer submitted should set forth your proposed lump sum contract price as well as any applicable prices for unit price work and alternates as provided in the Contract Documents. In the event you propose any substitution of subcontractors from those previously identified in your Proposal, please identify such subcontractors, and provide any required Subcontractor's Qualifications Statement and Questionnaire in accordance with the requirements of the Instructions to Proposers.

In the event the City receives no further response from your firm, it will consider your Proposal as previously submitted to be your best and final offer. The City continues to reserve the right to reject any and all Proposals and to waive any technicalities or informalities. All Proposals, and any response to this request for a best and final offer, are subject to all requirements of the Request for Proposals, the Instruction to Proposers, and all other requirements of the Contract Documents, and the City expressly reserves any and all rights relating thereto.

Should you have any questions concerning this matter, please contact _____.

Very truly yours,

SECTION 00080 - PROPOSAL FORM

EXHIBIT / TAB “H”

NAME OF PROJECT: **A NEW BUILDING FOR:
DALTON POLICE DEPARTMENT**

NAME OF OWNER: **CITY OF DALTON, GA**

**NAME OF PROPOSED
CONTRACTOR:**

(The “Contractor”)

THE CITY OF DALTON (the “City”), pursuant to the provisions of O.C.G.A. § 36-91-1, *et seq.*, herein seeks competitive Proposals from contractors for the construction of: “A New Building for Dalton Police Department”, located at 301 Jones Street, Dalton GA 30720 (the “Project”). This Proposal is submitted in response to the City’s Request for Proposals dated 3/1/2024.

This Proposal is for the full and complete construction of the Project in conformity with all requirements of the Contract Documents. The submission of this Proposal constitutes a representation by the Contractor that it has carefully studied and examined all of the Contract Documents dated 12/1/2023 furnished by KRH Architects Inc. (the “Architect”) and such other information as may have been furnished by the Board or the Architect including Addendum/Addenda No. _____. Contractor further represents that it has no knowledge of any ambiguities, errors, omissions or other inaccuracies in any of the Contract Documents or other material furnished by the Board or Architect in connection with the Project. Contractor submits herewith its duly executed affidavit in accordance with the applicable Federal work authorization program. Contractor acknowledges that upon execution of any contract with the Board, said affidavit shall be deemed a public record to the extent provided by Georgia law. Contractor acknowledges that the Contract Documents specifically provide for the assessment of liquidated damages against Contractor in the event of unexcused delay in achieving Substantial Completion or Final Completion of the work. The liquidated damages to be assessed in the event of unexcused delay in achieving Substantial Completion are \$ 500.00 per calendar day. The liquidated damages to be assessed in the event of unexecuted delay in achieving Final Completion of the Work are \$ 200.00 per calendar day. The terms and conditions of liquidated

damages provisions set for in the Contract Documents are herein incorporated by reference. The Contractor further acknowledges that the Contract Documents provide no incentive provisions for early Completion of the Work.

A. Base Proposal

The Contractor proposes to fully and completely construct the Project in conformity with all requirements of the Contract Documents and furnish all necessary labor, material and equipment for such construction, and, furthermore, to fully, completely, and strictly perform all obligations of the Contractor as set forth in the Contract Documents, for the lump sum contract price of

(\$_____). Said lump sum contract price is allocated, in its entirety, to the following elements of the work:

General Conditions	\$ _____
Earthwork and Civil	\$ _____
Concrete Foundation and Slabs	\$ _____
Structural Steel	\$ _____
Electrical	\$ _____
Mechanical	\$ _____
Plumbing	\$ _____
Roofing	\$ _____
Masonry	\$ _____
Other	\$ _____
Quantity Allowances (from below)	\$ _____
Lump Sum Allowances	\$ <u>24,000.00</u>
Contingency Allowances	\$ <u>150,000.00</u>
TOTAL (must match lump sum)	\$ _____

B. Unit Price Proposal (Quantity Allowances) ENTER TOTAL ABOVE

The Contractor proposes the following Allowance/Unit prices as described in sections 01020, 01026 and 04200. The total allowance for each item must be calculated from the quantities specified in Section 01020 (entered below) and the contractor's proposed Unit Price. Please reference section 01020 for complete description of work for each item.

<u>Item #</u>	<u>Description</u>	<u>Allowance Qty.</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Total Allowance</u>
1.	Remove and dispose of mass rock off site.	<u>25</u>	C.Y.	\$ _____	\$ _____
2.	Remove and dispose of mass rock on site.	<u>25</u>	C.Y.	\$ _____	\$ _____
3.	Remove and dispose of trench, rock off site.	<u>25</u>	C.Y.	\$ _____	\$ _____
4.	Remove and dispose of trench rock on site.	<u>25</u>	C.Y.	\$ _____	\$ _____
5.	Remove and dispose of unsuitable soil off site.	<u>200</u>	C.Y.	\$ _____	\$ _____
6.	Remove and dispose of unsuitable soil on site.	<u>100</u>	C.Y.	\$ _____	\$ _____
7.	Haul in and place suitable fill material from off site.	<u>200</u>	C.Y.	\$ _____	\$ _____
8.	Haul and place suitable fill material from on site.	<u>100</u>	C.Y.	\$ _____	\$ _____
9.	Haul in and place #4 stone	<u>100</u>	C.Y.	\$ _____	\$ _____
10.	Haul in and place #57 stone	<u>100</u>	C.Y.	\$ _____	\$ _____
11.	Haul in and place Rip Rap	<u>100</u>	C.Y.	\$ _____	\$ _____
12.	Haul in and place graded aggregate base (GAB).	<u>250</u>	C.Y.	\$ _____	\$ _____
13.	Furnish and install Tensar BX 1100 Geogrid or approved equal.	<u>500</u>	S.Y.	\$ _____	\$ _____

14.	Place and establish addl. sod	<u>1/4</u>	Acre	\$ _____	\$ _____
15.	Haul in and place top soil	<u>25</u>	C.Y.	\$ _____	\$ _____
16.	Furnish and install French Drain.	<u>100</u>	L.F	\$ _____	\$ _____
17.	Brick	_____		\$1,250 per 1000	\$ _____
		Enter Quantity			
<u>TOTAL QUANTITY ALLOWANCES</u>					<u>\$ _____</u>

C. Lump Sum Allowances:

1.	Landscaping Allowance	\$ 15,000.00
2.	Lab Table	\$ 5,500.00
3.	Lab Light	\$ 3,500.00
<u>TOTAL LUMP SUM ALLOWANCES</u>		<u>\$ 24,000.00</u>

D. Contingency Allowances:

1.	<u>Contingency Allowance</u>	<u>\$ 150,000.00</u>
<u>TOTAL CONTINGENCY ALLOWANCES</u>		<u>\$ 150,000.00</u>

BE SURE TO TOTAL AND INCLUDE ALL ALLOWANCES IN YOUR LUMP SUM!

Allowances and unit prices shall be used for unforeseen conditions above and beyond the work included in the contract documents. Calculation of the brick allowance is the sole responsibility of the contractor. No consideration will be given for additional funds due to a miscalculation of the number of bricks required.

The unit prices set forth herein shall be binding and shall become a part of the contract. The Contractor declares that it understands that the quantities shown, for unit price items, are approximate only and are subject to either increase or decrease, and that should the quantities of any of the items of the work be increased, the Contractor proposes to do the additional work at the unit prices stated herein; and should the quantities be decreased, the unused balance will be deducted from the contractor's lump-sum. The Contractor also understands that payment will be

made on the basis of actual quantities at the unit price bid and will make no claim for anticipated profits for any decrease in quantities and that actual quantities will be determined upon completion of the work, at which time adjustment will be made to the contract amount by direct increase or decrease. The unit prices set forth herein include all general conditions, overhead, profit and other compensation of every kind and nature associated with the unit price work. Contingency allowances shall be used for unforeseen conditions above and beyond the work included in the contract documents.

E. Alternate Proposals

Contractor proposes these Alternate Proposals. The lump sum pricing below is to fully implement the work described for each item described in Section 01030 - Alternates. **(The Contractor shall clearly indicate the pricing below by use of the words “Add” or “Deduct” as required)**

ALTERNATE NO. 1: Split Face Block

Add / Deduct \$ _____

Attached hereto, and incorporated herein as part of this Proposal, Contractor submits a completed Contractor’s Qualifications Tabs. Contractor acknowledges that the Board may rely upon the truthfulness and accuracy of the responses set forth therein. In addition, Contractor has submitted herewith as part of this Proposal such documentation and information as Contractor deems appropriate to establish that it is a responsible and responsive Contractor and that its Proposal is the most advantageous to the Board, taking into consideration the specific evaluation factors, listed in their order of relative importance, as set forth in the above-referenced Request for Proposals. Contractor acknowledges that the Board may rely upon the truthfulness and accuracy of such documentation and information.

The Contractor proposes and agrees to commence actual construction (i.e, physical work) on site with adequate management, labor, materials and equipment within ten (10) days after receipt of Notice to Proceed and prosecute the Work diligently and faithfully to completion

within the required Contract Time. Prior to commencing such Work, and prior to the issuance of the Notice to Proceed, Contractor shall furnish to the Board duly executed Payment and Performance Bonds complying with all requirements of the Contract Documents along with Certificates of Insurance demonstrating that all required coverages are in place.

Contractor submits herewith its executed Bid Bond in accordance with the requirements of the Board as set forth in the Instruction to Proposers and the required federal forms.

Contractor herein acknowledges that this Proposal shall constitute an offer by Contractor to contract with the Board for construction of the Project in conformity with all requirements of the Contract Documents for the lump sum contract price as set forth hereinabove. Said offer by Contractor is irrevocable and subject to acceptance by the Board until the expiration of sixty (60) days following the date set forth in the Request for Proposals for receipt of Proposals by the Board.

Sworn and subscribed to before me this

_____ day of _____, 2024.

CONTRACTOR: _____

By: _____

Title: _____

NOTARY PUBLIC

Commission Expiration:

SECTION 00090
THE CONTRACT FOR CONSTRUCTION
AND INCORPORATED GENERAL CONDITIONS

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THE CONTRACT FOR CONSTRUCTION AND INCORPORATED GENERAL CONDITIONS

This Contract is made by and between the City of Dalton, GA (the "Owner") and _____ (the "Contractor") under seal for construction of A New Building for Dalton Police Department (the "Project"). The Owner and the Contractor hereby agree as follows:

ARTICLE 1. THE CONTRACT AND THE CONTRACT DOCUMENTS

1.1 The Contract

1.1.1 The Contract between the Owner and the Contractor, of which this Contract is a part, consists of the Contract Documents. It shall be effective on the date this Contract is executed by the last party to execute it.

1.2 The Contract Documents

1.2.1 The Contract Documents consist of this Contract, the Specifications, the Drawings, Supplemental Conditions, all Change Orders and Field Orders issued hereafter, any other amendments hereto executed by the parties hereafter, together with the following (if any):

1.3 Entire Agreement

1.3.1 This Contract, together with the Contractor's performance and payment bonds for the Project, constitute the entire and exclusive agreement between the Owner and the Contractor with reference to the Project. Specifically, but without limitation, this Contract supersedes any bid documents and all prior written or oral communications, representations and negotiations, if any, between the Owner and the Contractor.

1.4 No Privity with Others

1.4.1 Nothing contained in this Contract shall create, or be interpreted to create, privity or any other contractual agreement between the Owner and any person or entity other than the Contractor.

1.5 Intent and Interpretation

1.5.1 The intent of this Contract is to require complete, correct, and timely execution of the Work. Any Work that may be required, implied or inferred by the Contract Documents, or any one or more of them, as necessary to produce the intended result shall be provided by the Contractor for the Contract Price.

1.5.2 This Contract is intended to be an integral whole and shall be interpreted as internally consistent. What is required by any one Contract Document shall be considered as required by the Contract.

1.5.3 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.

1.5.4 The words "include", "includes", or "including", as used in this Contract, shall be deemed to be followed by the phrase, "without limitation".

1.5.5 The specification herein of any act, failure, refusal, omission, event, occurrence or condition as constituting a material breach of this 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 this Contract.

1.5.6 Words or terms used as nouns in this Contract shall be inclusive of their singular and plural forms, unless the context of their usage clearly requires a contrary meaning.

1.5.7 The Contractor shall have a continuing duty to read, carefully study and compare each of the Contract Documents, the Shop Drawings and the Product Data, and shall give written notice to the Owner and the Architect of any inconsistency, ambiguity, error, or omission that the Contractor discovers regarding these documents before proceeding with the affected Work. The issuance or the express or implied approval by the Owner or the Architect of the Contract Documents, Shop Drawings, or Product Data shall not relieve the Contractor of the continuing duties imposed hereby, nor shall any such approval be evidence of the Contractor's compliance with this Contract. The Owner has requested the Architect to only prepare documents for the Project, including the Drawings and Specifications, which are accurate, adequate, consistent, coordinated and sufficient for construction. HOWEVER, THE OWNER MAKES NO REPRESENTATION OR WARRANTY OF ANY NATURE WHATSOEVER TO THE CONTRACTOR CONCERNING SUCH DOCUMENTS. By the execution hereof, the Contractor acknowledges and represents that it has received, reviewed, and carefully examined such documents, has found them to be complete, accurate, adequate, consistent, coordinated and sufficient for construction, and that the Contractor has not, does not, and will not rely upon any representation or warranties by the Owner concerning such documents as no such representation or warranties have been or are hereby made.

1.5.8 The Contractor herein acknowledges and represents that prior to the submission of its bid, and prior to its execution of this Contract, it visited and carefully examined the Project site and any and all structures located thereon, and it thoroughly correlated the results of such visit and examination with the requirements of the Contract Documents. The Contractor further acknowledges that it has become familiar with the local conditions under which the Work is to be performed, and the cost of properly addressing such conditions during performance of the Work is included in the Contract Price.

1.5.9 Neither the organization of any of the Contract Documents into divisions, sections, paragraphs, articles, or other categories nor the organization or arrangement of the Design shall control the Contractor in dividing the Work or in establishing the extent or scope of the Work to be performed by Subcontractors. Unless otherwise provided herein, a reference to "Article" or "Section" shall include all sections, subsections, and other subdivisions of such Section or Article.

1.6 Ownership of Contract Documents

1.6.1 The Contract Documents, and each of them, shall remain the property of the Owner. The Contractor shall have the right to keep one record set of the Contract Documents upon completion of the Project. However, in no event shall Contractor use, or permit to be used, any or all of such Contract Documents on other projects without the Owner's prior written authorization.

1.7 Hierarchy of Contract Documents

1.7.1 In the event of any conflict, discrepancy, or inconsistency among any of the Contract Documents, the following hierarchy shall control: (a) as between figures given on Drawings and the scaled measurements, the figures shall govern; (b) as between large scale drawings and small scale drawings, the large scale shall govern; (c) as between Drawings and Specifications, the requirements of the Specifications shall govern; (d) as between the Contract for Construction and Incorporated General Conditions and the Specifications, the requirements of the Contract for Construction and Incorporated General Conditions shall govern; (e) as between any Supplemental Conditions and the Contract for Construction and Incorporated General Conditions, the requirements of the Supplemental Conditions shall govern. As set forth hereinabove, any and all conflicts, discrepancies, or inconsistencies shall be immediately reported to the Owner and the Architect in writing by the Contractor.

ARTICLE 2. THE WORK

2.1 The Contractor shall perform all of the Work required, implied or reasonably inferable from, this Contract.

2.2 The term "Work" shall mean whatever is done by or required of the Contractor to perform and complete its duties under this Contract, including the following: (i) construction of the whole or a designated part of the Project; (ii) furnishing of any required surety bonds and insurance; and (iii) the provision or furnishing of labor, supervision, services, materials, supplies, equipment, fixtures, appliances, facilities, tools, transportation, storage, power, permits and licenses required of the Contractor. Fuel, heat, light, cooling and all other utilities as required by this Contract shall also be deemed part of the Work. The Work to be performed by the Contractor is generally described as follows:

ARTICLE 3. CONTRACT TIME

3.1 Time and Damages for Delay

3.1.1 The Contractor shall commence the Work on _____ and shall achieve Substantial Completion of the Work no later than _____. The number of calendar days from the date on which the Work is permitted to proceed, through the date set forth for Substantial Completion, shall constitute the "Contract Time."

3.1.2 The Contractor shall pay the Owner the sum of **\$500** per day for each and every calendar day of delay in achieving Substantial Completion beyond the date set forth herein for Substantial Completion of the Work. Any sums due and payable under this Section 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 or before the time of executing this Contract. When the Owner reasonably believes that Substantial Completion will be delayed, the Owner shall be entitled, but not required, to withhold from any amounts otherwise due the Contractor an amount then believed by the Owner to be adequate to cover liquidated damages applicable to such delays. If and when the Contractor 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 Contractor those funds withheld, but no longer applicable, as liquidated damages. Notwithstanding any other provision of this Section, the Owner and the Contractor expressly agree that the liquidated damages set forth herein do not contemplate, nor do they cover, any Funding Delay Damages as identified in Section 5.6.1.2. Any such Funding Delay Damages shall be in addition to the liquidated damages allowed pursuant to this Section.

3.2 Substantial Completion

3.2.1 "Substantial Completion" shall mean that stage in the completion of the Work when the Work is sufficiently complete in accordance with this Contract such that the Owner can enjoy beneficial use and occupancy of the Work, can utilize the Work for its intended purpose, and a Certificate of Occupancy has been issued allowing full and complete occupancy of the entire Project. Additionally, the Work shall not be deemed to be Substantially Complete until all nonconforming Work specifically rejected by the Architect has been properly completed as required by the Contract and until all operational manuals, "marked-up" drawings, and similar required documents are delivered to the Architect for transmission to the Owner. However, the mere issuance of a Certificate of Occupancy will not, by itself, constitute Substantial Completion. Ordinary and customary punchlist items shall be completed after Substantial Completion as provided by Section 5.5. 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.

3.2.2 In addition to the requirements for Substantial Completion as set forth in Section 3.2.1, as an express condition for Substantial Completion, the Contractor shall furnish to the Owner and the Architect, in writing, a detailed list of all incomplete and deficient Work which must be completed and corrected prior to Final Completion of the Project. THIS LIST SHALL BE IN ADDITION TO ALL PUNCHLISTS REQUIRED ELSEWHERE BY THIS CONTRACT. Furthermore, notwithstanding any other provision of this Contract, an express condition for Substantial Completion is the submission by the Contractor to Owner and Architect of any warranties, manuals, drawings, forms, or other documents or things, of any kind or nature, as may be required for Substantial Completion by any of the Contract Documents. In the event the Contract Documents require the submission of any such documents or things in order for the Project to be considered Substantially Complete, receipt of same by Owner and Architect is an express condition precedent to any duty by Owner to make any payment otherwise due Contractor upon Substantial Completion.

3.3 Time is of the Essence

3.3.1 All limitations of time set forth in the Contract Documents are of the essence of this Contract.

ARTICLE 4. CONTRACT PRICE

4.1 The Contract Price

4.1.1 The Owner shall pay, and the Contractor shall accept, as full and complete payment for all of the Work, the fixed sum of _____. The sum set forth in this Section shall constitute the Contract Price and shall not be modified except by Change Order as provided in this Contract. The fixed sum includes the following:

ARTICLE 5. PAYMENT OF THE CONTRACT PRICE

5.1 Schedule of Values

5.1.1 Within ten (10) calendar days after the effective date hereof, the Contractor shall submit to the Owner and to the Architect a Schedule of Values allocating the Contract Price among the various portions of the Work. The Contractor's Schedule of Values shall be prepared in such form, with such detail, and supported by such data as the Architect or the Owner may require to substantiate its accuracy. The Contractor shall not imbalance the Schedule of Values or artificially inflate any element thereof. The violation

of this provision by the Contractor shall constitute a material breach of this Contract. The Schedule of Values shall be used only as a basis for the Contractor's Applications for Payment and shall only constitute such basis after it has been acknowledged in writing by the Architect and the Owner. Receipt of the Schedule of Values as required herein is a condition precedent to payment of any sums due the Contractor.

5.1.2 In the event any Work is to be performed under a unit-price agreement, the Contractor acknowledges and represents that it has not imbalanced or artificially inflated the unit prices, and if requested by the Owner or the Architect, the Contractor shall provide such data and supporting documentation as may be requested to support the reasonableness and accuracy of such unit prices. Unit prices establish the complete and total sum to be paid for the unit price work, and such unit prices include any and all applicable overhead, profit, and mark-up of every kind and nature.

5.2 Payment Procedure

5.2.1 The Owner shall pay the Contract Price to the Contractor as provided in Section 5.2.

5.2.2 Progress Payments. Based upon the Contractor's Applications for Payment submitted to the Architect and upon Certificates for Payment subsequently issued to the Owner by the Architect, the Owner shall make progress payments to the Contractor on account of the Contract Price.

5.2.2.1 On or before the 5th day of each month after commencement of the Work, the Contractor shall submit an Application for Payment for the period ending the 30th day of the preceding month to the Architect in such form and manner, and with such supporting data and content, as the Owner or the Architect may require.

5.2.2.2 Each Application for Payment may request payment for ninety-five percent (95%) of that portion of the Contract Price properly allocable in the Schedule of Values to Contract requirements properly performed and labor, materials, and equipment properly incorporated in the Work plus ninety-five percent (95%) of that portion of the Contract Price properly allocable in the Schedule of Values to materials or equipment properly stored on-site for subsequent incorporation in the Work, less the total amount of previous payments. Payment for stored materials and equipment shall be conditioned upon the Contractor's proof satisfactory to the Owner, that the Owner has title to such materials and equipment, and shall include proof of required insurance.

5.2.2.3 Each Application for Payment shall be signed by the Contractor, which shall constitute the Contractor's representation that the Work has progressed to the level for which payment is requested in accordance with the Schedule of Values, that the Work has been properly installed or performed in full accordance with this Contract, and that the Contractor knows of no reason why payment should not be made as requested.

5.2.2.4 The Architect will review the Application for Payment and may also review the Work at the Project site or elsewhere to determine whether the quantity and quality of

the Work is as represented in the Application for Payment and is as required by this Contract. Based on the Architect's evaluations of the Contractor's Application for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment for such amounts.

5.2.2.5 The amount of each partial payment shall be the amount certified for payment by the Architect less such amounts, if any, otherwise owing by the Contractor to the Owner or which the Owner shall have the right to withhold as authorized by this Contract. The Architect's certification of an Application for Payment shall not preclude the Owner from the exercise of any of its rights as set forth in Section 5.3, and the Architect shall have the right to amend or withdraw any previously executed Certification of Payment if it determines that such amendment or withdrawal is necessary to protect the interest of the Owner under this Contract.

5.2.2.6 The Owner shall make partial payments on account of the Contract Price to the Contractor within thirty (30) days following the Architect's certification of the amount due thereunder.

5.2.2.7 When the Contractor reaches Substantial Completion, the Contractor may submit in writing to the Owner a request for release of retainage, and the Owner shall, within 30 days after submission of Contractor's pay application and other appropriate documentation as may be required by the Contract Documents are provided, pay the retainage to the Contractor. If at that time there are any remaining incomplete items of Work, an amount equal to 200 percent (200%) of the value of each item, as determined by the Architect, shall be withheld until such item or items are completed. The retainage shall be shared by the Contractor and Subcontractors as their interests may appear. At the discretion of the Owner, and with the approval of the Contractor, the retainage of any Subcontractor may be released separately as the Subcontractor completes its work. The rights of the Owner set forth herein to retainage are in addition to all the other rights and remedies of the Owner set forth in this Contract. Notwithstanding any other provisions herein, the Contractor shall not request, nor shall it be entitled to receive, any reduction in retainage, or any cessation in the withholding of retainage, so long as any Work has been rejected by the Architect and such Work has not been corrected or otherwise performed in accordance with all requirements of the Contract Documents.

5.2.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment, all Work for which payments have been received from the Owner shall be free and clear of liens, claims, security interest, or other encumbrances in favor of the Contractor or any other person or entity.

5.2.4 The Contractor shall promptly pay each Subcontractor, out of the amount paid to the Contractor on account of such Subcontractor's Work, the amount to which such Subcontractor is entitled and shall furnish proof of such payment to the Owner and Architect. The Contractor shall also procure and furnish to the Owner and Architect such

affidavits of payment, proofs of payment, and lien waivers from Subcontractors, suppliers, laborers and materialmen as the Owner or Architect may require.

5.2.5 The submission of any Application for Payment by the Contractor to the Architect shall constitute a representation by the Contractor to both the Architect and the Owner that such Application includes any and all sums due the Contractor as of the date of such Application. Payment by the Owner to the Contractor of any sums certified by the Architect pursuant to an Application for Payment shall constitute full and complete payment to the Contractor, save and except for any unpaid retainage, of all sums due the Contractor from the Owner as of the date of such Application.

5.2.6 No progress payment, nor any use or occupancy of the Project by the Owner, shall be interpreted to constitute an acceptance of any Work not in strict accordance with this Contract.

5.3 Withheld Payment

5.3.1 The Owner may decline to make payment, may withhold funds, and, if necessary, may demand the return of some or all of the amounts previously paid to the Contractor, to protect the Owner from loss because of:

- (a) Work rejected by the Architect or other defective Work not remedied by the Contractor or, in the opinion of the Owner, not likely to be remedied by the Contractor;
- (b) Work which requires further testing or inspection to verify that it has been installed in accordance with the requirements of the Contract Documents;
- (c) Claims of third parties against the Owner or the Owner's property;
- (d) Failure by the Contractor to pay Subcontractors or others in a prompt and proper fashion;
- (e) Evidence that the balance of the Work cannot be completed in accordance with the Contract for the unpaid balance of the Contract Price;
- (f) Evidence that the Work will not be completed within the time required for Substantial Completion or Final Completion;
- (g) Persistent failure to carry out the Work in accordance with the Contract;
- (h) Damage to the Owner or a third party to whom the Owner is, or may be, liable.

5.3.2 If the Owner makes written demand upon the Contractor for amounts previously paid by the Owner as contemplated in this Section 5.3, the Contractor shall promptly comply with such demand within 10 days.

5.4 Unexcused Failure to Pay

5.4.1 If the Owner, without cause or basis hereunder, fails to pay the Contractor any amount then due and payable to the Contractor within forty-five (45) days after the date established for payment, then the Contractor may after seven (7) additional days' written notice to the Owner and the Architect, and without prejudice to any other available rights or remedies it may have, stop the Work until payment of those amounts due from the Owner have been received. Any payment not made within forty-five (45) days after the date due shall bear interest at the rate of four percent (4%) per annum. No other interest shall be due Contractor.

5.5 Process For Substantial Completion

5.5.1 When the Contractor believes that the Work is Substantially Complete, the Contractor shall submit in writing to the Architect a list of items to be completed or corrected. When the Architect, on the basis of an inspection, determines that the Work is in fact Substantially Complete, the Architect will prepare a Certificate of Substantial Completion, which shall establish the date of Substantial Completion and shall state the responsibilities of the Owner and the Contractor for Project security, maintenance, heat, utilities, damage to the Work, and insurance. The Contractor shall have **30 Days** after the date of Substantial Completion to complete the items listed therein. The Certificate of Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance of the responsibilities assigned to them in such certificate.

5.5.2 Upon Substantial Completion of the Work, and execution by both the Owner and the Contractor of the Certificate of Substantial Completion, and upon submission to the Owner of a complete set of record drawings illustrating the as-built condition of the Work (including the location of all utilities) along with all maintenance manuals and warranties required by the Contract Documents, the Owner shall pay the Contractor an amount sufficient to increase total payments to the Contractor to one hundred percent (100%) of the Contract Price less two hundred percent (200%) of the reasonable cost as determined by the Owner and the Architect for completing all incomplete Work, correcting and bringing into conformance all defective and nonconforming Work, and handling all unsettled claims. No further payments shall be made until Final Completion is achieved.

5.5.3 In the event the Contractor fails or refuses to complete the incomplete Work, or correct and bring into conformance the defective Work, or resolve any unsettled claims, the Owner, without limitation on any of its other rights or remedies, may complete the Work, remedy any defects in the Work, and resolve any unsettled claims relating to the Work, and the Contractor shall be liable to the Owner's damages including the cost of same. If the Work is completed or corrected by employees of the Owner, the Contractor shall be liable for the reasonable value of the completion or correction based upon the reasonable commercial cost of such Work as if performed by an independent contractor. To the extent the amount due the Owner hereunder exceeds the retainage held by the Owner, the balance due shall be paid by the Contractor within ten (10) days after receipt of an invoice or demand for payment from the Owner.

5.5.4 With respect to any and all Work performed by the Contractor after Substantial Completion of the Project or after any occupancy of the Project, in whole or in part, by the Owner, absent prior written consent of the Owner, such Work shall not be performed (a) during normal operating hours of the Owner's activities at the Project; (b) during the installation of any fixtures, furniture, or equipment by the Owner, or (c) during any cleaning, waxing, or other work by the Owner. Furthermore, any such Work shall only be performed in accordance with a detailed schedule indicating the proposed nature and area where the Work will be performed, the specific date and time of the Work, and, the identity of each Subcontractor who will be performing any of the Work. SUCH WORK SHALL NOT COMMENCE UNLESS THE OWNER FIRST APPROVES THE PROPOSED SCHEDULE. All such Work shall be under the supervision of the Contractor, and the Contractor shall be, and shall remain, on the Project site during the performance of the Work. If any such Work requires or necessitates the presence of the Owner or the Architect, the Contractor shall be responsible for the cost thus incurred by the Owner or Architect. Each day the area where such Work is located, and any adjacent area impacted by the Work, shall be carefully cleaned by the Contractor and any construction debris shall be properly removed. All such areas shall be left by the Contractor in full operating condition.

5.5.5 Notwithstanding any other provision of this Contract, a condition precedent for Substantial Completion of the Project is the successful performance of an operational test on each of the following Project systems: the electrical system; the mechanical system; the fire alarm system; the lighting control system; the sound system; and the energy management system. Each such test shall be conducted in strict accordance with all requirements of the Specifications, and each such system must operate in full conformity with all requirements of said Specifications for not less than fifteen (15) consecutive calendar days prior to the date of Substantial Completion. Before the initiation of the operational test for each such system, and before the commencement of such operational testing period, Contractor shall first give the Owner and the Architect not less than three (3) days' prior written notice.

5.6 Final Completion and Final Payment

5.6.1 When the Contractor believes that all of the Work has reached Finally Completion and the Contractor is ready for a final inspection, it shall notify the Owner and the Architect thereof in writing. Thereupon, the Architect will make final inspection of the Work and, if the Work is complete in full accordance with this Contract and this Contract has been fully performed, the Architect will promptly declare the Work to have reached Final Completion and will issue a final Certificate for Payment certifying to the Owner that the Project is complete and the Contractor is entitled to the remainder of the unpaid Contract Price, less any amount withheld pursuant to this Contract. All warranties and guarantees required by the Contract shall commence on the date of Final Completion of the Work. If the Architect is unable to issue its final Certificate for Payment and is required to repeat its final inspection of the Work, the Contractor shall bear the cost of repeat final inspections, which cost may be deducted by the Owner from the Contractor's final payment.

5.6.1.1 If the Contractor fails to achieve Final Completion within the time fixed therefor by the Architect in its Certificate of Substantial Completion, the Contractor shall pay the Owner the sum of \$200.00 per day for each and every calendar day of unexcused delay in achieving Final Completion beyond the date set forth herein for Final Completion of the Work. Any sums due and payable hereunder by the Contractor 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 or before the time of executing this Contract. When the Owner reasonably believes that Final Completion will be inexcusably delayed, the Owner shall be entitled, but not required, to withhold from any amounts otherwise due the Contractor an amount then believed by the Owner to be adequate to cover liquidated damages applicable to such delays. If and when the Contractor overcomes the delay in achieving Final Completion, or any part thereof, for which the Owner has withheld payment, the Owner shall promptly release to the Contractor those funds withheld, but no longer applicable, as liquidated damages. Notwithstanding any other provision of this Section, the Owner and the Contractor expressly agree that the liquidated damages set forth herein do not contemplate, nor do they cover, any Funding Delay Damages as identified in Section 5.6.1.2. Any such Funding Delay Damages shall be in addition to the liquidated damages allowed pursuant to this Section.

5.6.1.2 The Contractor recognizes and acknowledges that delay in achieving Substantial Completion, Final Completion, or final close-out of the Project could jeopardize the Owner's state or federal funding or other financial support for the Project. Among other things, any such delay could cause the forfeiture of unspent funds; the cost and expense of premature bond redemption; or other cost, expense, liability, loss, or damage arising out of or relating to the impairment of Project funding (any and all such potential losses and damages are referred to as "Funding Delay Damages"). The Contractor and the Owner furthermore expressly recognize, acknowledge, and agree that the liquidated damages established in Sections 3.1.2 and 5.6.1.1 do not contemplate or cover Funding Delay Damages, and that in the event any such Funding Delay Damages are suffered or sustained by the Owner as the result of any Project delays caused by the Contractor, or for which the Contractor is otherwise responsible under this Contract, the Owner shall be entitled to recover such Funding Delay Damages from the Contractor, and the Contractor shall be liable to the Owner for same. Nothing contained herein shall preclude the recovery by the Owner of the liquidated damages set forth elsewhere in this Contract.

5.6.2 The Contractor shall not be entitled to final payment unless and until it submits to the Architect and Owner all documents required by the Contract, including but not limited to its affidavit that all payrolls, invoices for materials and equipment, and other liabilities connected with the Work for which the Owner, or the Owner's property might be responsible, have been fully paid or otherwise satisfied; releases and waivers of lien from all Subcontractors of the Contractor and of any and all other parties required by the Architect or the Owner; if Owner so elects in its sole discretion, consent of Surety, if any, to final payment; and all required warranties, maintenance and operation manuals, record and as-built drawings. If any third party fails or refuses to provide a release of claim or

waiver of lien as required by the Owner, the Contractor shall furnish a bond satisfactory to the Owner to discharge any such lien or indemnify the Owner from liability. FULL AND COMPLETE COMPLIANCE WITH ALL TERMS AND CONDITIONS OF THIS SECTION IS A CONDITION PRECEDENT TO FINAL PAYMENT.

5.6.3 Subjection to the conditions precedent in Section 5.6.2, the Owner shall make final payment of all sums due the Contractor within thirty (30) days of the Architect's execution of a final Certificate for Payment.

5.6.4 Acceptance of final payment shall constitute a waiver of all claims against the Owner by the Contractor except for those claims previously made in writing against the Owner by the Contractor, pending at the time of final payment, and identified in writing by the Contractor as unsettled at the time of its request for final payment.

5.6.5 The Owner and the Contractor expressly agree that the terms of payment, payment periods, and rates of interest herein shall control to the exclusion of any provisions set forth in the Georgia Prompt Pay Act, O.C.G.A. § 13-11-1 *et seq.*, and the provisions of said Act are herein waived.

ARTICLE 6. THE OWNER

6.1 Information, Services and Things Required from Owner

6.1.1 If the Contractor requests in writing, the Owner shall furnish to the Contractor, prior to the execution of this Contract, any and all written and tangible documentation in its possession concerning conditions below ground at the site of the Project. Such documentation is furnished to the Contractor only 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 in whole or in part, implicitly or explicitly, or at all, and shall have no liability therefor. The Owner shall also furnish surveys, legal limitations, utility locations (if known), and a legal description of the Project site. To the extent the Owner furnishes any information concerning utility locations, the Owner makes no representations or warranties concerning same and shall have no liability to Contractor in the event such information contains discrepancies or is otherwise inaccurate. Nothing contained herein shall limit the Contractor's duties and representations as set forth in Section 1.5.8 hereinabove.

6.1.2 Excluding permits and fees normally the responsibility of the Contractor, the Owner shall obtain all approvals, easements, and the like required for construction and shall pay for necessary assessments and charges required for construction, use, or occupancy of permanent structures or for permanent changes in existing facilities.

6.2 Right to Stop Work

6.2.1 In the event of an emergency threatening injury to person or property, or if the Contractor fails or refuses to perform the Work in accordance with this Contract, the

Owner may order the Contractor to stop the Work, or any described portion thereof, until the cause for stoppage has been corrected, no longer exists, or the Owner orders that Work be resumed. In such event, the Contractor shall immediately comply with such order.

6.3 Owner's Right to Perform Work

6.3.1 If the Contractor has installed defective or deficient Work which is not in conformity with the requirements of the Contract Documents, or if the Contractor fails or refuses to perform any portion of the Work, then the Owner may, without prejudice to any other rights or remedies the Owner may have against the Contractor, proceed to carry out the subject Work. In such a situation, the Contract Price shall be reduced by the cost of performing the subject Work, plus compensation for the Architect's additional services and expenses necessitated thereby, if any. If such Work is performed by employees of the Owner, the Contract Price reduction shall reflect the reasonable value of such Work based upon the reasonable commercial cost of such Work as if performed by an independent contractor. If the unpaid portion of the Contract Price is insufficient to cover the amount due the Owner, the Contractor shall pay the difference to the Owner within ten (10) days of receipt of demand from the Owner.

ARTICLE 7. THE CONTRACTOR

7.1 Contractor's General Duties.

7.1.1 The Contractor shall comply with the requirements of Sections 1.5.7 and 1.5.8. The Contractor shall perform no part of the Work at any time without adequate Contract Documents or, as appropriate, approved Shop Drawings, Product Data, or Samples for such portion of the Work. If the Contractor performs any of the Work for which it knows or should have known the Contract Documents contain an error, inconsistency, or omission without notice to the Architect, then the Contractor shall be responsible for such performance and shall pay the cost of correction.

7.1.2 The Contractor shall perform the Work strictly in accordance with this Contract.

7.1.3 The Contractor shall supervise and direct the Work using the Contractor's best skill, effort, and attention. The Contractor shall be responsible to the Owner for any and all acts or omissions of the Contractor, its employees, its Subcontractors, and others engaged in the Work on behalf of the Contractor.

7.2 Warranty

7.2.1 The Contractor warrants to the Owner that all labor furnished to progress the Work under this Contract will be competent to perform the tasks undertaken, that the product of such labor will yield only first-class results, that materials and equipment furnished will be of good quality and new unless otherwise permitted by this Contract, and that the Work

will be of good quality, free from faults and defects, and in strict conformance with this Contract. All Work not conforming to these requirements may be considered defective.

7.2.2 The Contractor shall obtain and pay for all permits, inspections, fees, and licenses necessary and ordinary for the Work. The Contractor shall comply with all lawful requirements applicable to the Work, and shall give and maintain any notices required by applicable law, ordinance, or regulation pertaining to the Work. The duties and obligations of the Contractor arising hereunder include but are not limited to the full and strict compliance of the Contractor with all rules, regulations and legal mandates of the United States Department of Labor; the United States Immigration and Naturalization Service; the Georgia Department of Labor; the United States Department of Environmental Protection; and the Georgia Environmental Protection Division of the Department of Natural Resources. The Contractor shall furthermore comply with any and all applicable federal, state and local tax laws, unemployment compensation acts, and workers' compensation acts, and upon request of the Owner to the Contractor shall furnish written proof of such compliance. The Contractor shall defend, indemnify and hold the Owner harmless from any and all fines or citations issued against Owner, or any other damages, arising out of, or relating to, any violations by the Contractor of any law, rule, regulation or ordinance of any governmental authority. This duty of indemnification specifically includes, but is not limited to, the duty to indemnify and hold the Owner harmless from any and all attorneys' fees, court costs, expert witness fees, and other expenses arising out of any such fine or citation or otherwise resulting from any such violation by the Contractor.

7.3 Supervision

7.3.1 The Contractor shall employ and maintain at the Project site only competent supervisory personnel. Any supervisory or other personnel reasonably objectionable to the Owner shall be removed from the Project. Absent written instruction from the Contractor to the contrary, the superintendent shall be deemed the Contractor's authorized representative at the site and shall be authorized to receive and accept any and all communications from the Owner or the Architect. The Contractor shall attend any job site or other Project meetings as may be requested by the Owner or the Architect and shall have available in person such management personnel at any such meetings as the Owner or the Architect may require.

7.3.2 Key supervisory personnel assigned by the Contractor to this Project are as follows:

<u>Name</u>	<u>Function</u>

All supervisory personnel are subject to approval by the Owner. So long as the individuals named above remain actively employed or retained by the Contractor, they shall perform

the functions indicated next to their names unless the Owner agrees to the contrary in writing. In the event one or more individuals not listed above subsequently assumes one or more of those functions listed above, the Contractor shall be bound by the provisions of this Section as though such individuals had been listed above. Within ten (10) days after commencement of the Work, the Contractor shall furnish the Owner and the Architect with the current home and office address of each of the individuals listed above along with their home, office, mobile, pager, and facsimile telephone numbers and with their respective email addresses. Any change in such information shall be immediately furnished in writing to the Owner and the Architect.

7.4 Schedules

7.4.1 The Contractor, within ten (10) days of commencing the Work, shall submit to the Owner and the Architect for their information the Contractor's schedule for completing the Work. Said schedule shall be based on the required dates for Substantial Completion and Final Completion and shall include any milestone dates set forth in the Contract Documents. Additionally, within ten (10) days of commencing the Work, the Contractor shall submit to the Owner and the Architect a separate shop drawing and submittal schedule detailing the schedule for the submission to the Architect of all shop drawings, submittals, product data and other similar documents. Each of the schedules required herein shall be revised no less frequently than monthly (unless the parties otherwise agree in writing) 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 and the Architect. The schedules and all revisions shall be in such form, and shall contain such detail, as the Owner or the Architect may require. THE PARTIES SPECIFICALLY AGREE THAT ANY FLOAT CONTAINED IN THE SCHEDULES SHALL BELONG TO THE PROJECT AND IN NO EVENT SHALL THE CONTRACTOR MAKE CLAIM FOR ANY ALLEGED DELAY, ACCELERATION, OR EARLY COMPLETION SO LONG AS THE PROJECT IS COMPLETED WITHIN THE CONTRACT TIME. Strict compliance with the requirements of this Section is a condition precedent for payment to the Contractor, and failure by the Contractor to strictly comply with said requirements shall constitute a material breach of this Contract.

7.4.2 In addition to the schedules and revisions required in Section 7.4.1, with the submission of each Application for Payment, the Contractor shall submit a 30-day look-ahead schedule setting forth in detail the Work to be performed during the next 30 days and shall also submit a 30-day look-back schedule setting forth in detail the Work actually performed during the preceding 30 days, as compared to the Work scheduled during such period. The look-ahead and look-back schedules shall be in such form as the Owner may require, and the timely receipt of such schedules shall be a condition precedent to the Owner's duty to make payment to the Contractor.

7.4.3 Without limitation on any other rights or remedies of the Owner in the event Contractor fails or refuses to progress the Work, or any portion thereof, in accordance with the requirements of the Project schedule, the Owner or Architect may order or direct the Contractor to take one or more of the following actions:

- (a) Increase the labor force of Contractor and its Subcontractors;
- (b) Implement overtime operations;
- (c) Increase the number or duration of shifts;
- (d) Supplement its Project management;
- (e) Furnish additional equipment to its forces;
- (f) Accelerate delivery of material and supplies; or
- (g) Take such other action as the Owner reasonably believes necessary to increase the rate of progress.

7.4.4 The Contractor shall proceed with any action ordered or directed by Owner or Architect under Section 7.4.3 within forty-eight (48) hours of receipt of such order or direction. UNDER NO CIRCUMSTANCES SHALL CONTRACTOR MAKE CLAIM FOR, OR BE ENTITLED TO RECOVER, ANY COST, EXPENSE, LOSS OR DAMAGE ARISING OUT OF, OR RELATING TO, ANY SUCH ORDER OR DIRECTION OF OWNER OR ARCHITECT OR ANY ACTION TAKEN IN RESPONSE THERETO.

7.5 Shop Drawings, Product Data and Samples

7.5.1 Shop Drawings, Product Data, Samples, and other submittals from the Contractor do not constitute Contract Documents. Their purpose is merely to demonstrate the manner in which the Contractor intends to implement the Work in conformance with information received from the Contract Documents.

7.5.2 In no event shall the Contractor submit any Shop Drawings, Product Data, or Sample which is not in conformity with the requirements of the Contract Documents, and the Contractor shall not perform any portion of the Work requiring submittal and review of Shop Drawings, Product Data, or Samples unless and until same shall have been approved by the Architect. Approval by the Architect, however, shall not be evidence that the Shop Drawings, Product Data, or Sample, or Work installed pursuant thereto, conforms to the requirements of this Contract.

7.5.3 The Contractor shall continuously maintain at the site, for the benefit of the Owner and the Architect, one record copy of this Contract marked to record on a current basis changes, selections, and modifications made during construction. Additionally, the Contractor shall maintain at the site for the Owner and Architect the approved Shop Drawings, Product Data, Samples, and other similar required submittals. Upon Final Completion of the Work, all of these record documents shall be delivered to the Owner.

7.6 Cleaning the Site and the Project

7.6.1 The Contractor shall keep the site reasonably clean to the satisfaction of the Owner and Architect during performance of the Work. Upon Final Completion of the Work, the Contractor shall clean the site and the Project and remove all waste, together with all of the Contractor's property therefrom.

7.7 Access to Work

7.7.1 The Owner and the Architect shall have access to the Work at all times from commencement of the Work through Final Completion. The Contractor shall take whatever steps necessary to provide access when requested.

7.8 Indemnity

7.8.1 The Contractor shall be responsible from the time of signing the Contract, or from the time of commencement of the Work, whichever shall first occur, for all injury or damage of any kind resulting from the Work to persons or property, including employees and property of the Owner. The Contractor shall indemnify, defend and hold harmless the Owner from and against all claims or actions, whether actual or threatened, and all attorney fees and cost of defense thereof, arising out of or relating to damage or injury (including death) to persons or property caused by or sustained in connection with the performance of this Contract or by conditions created thereby, arising out of or any way connected with the Work performed under this Contract or any act or omission of the Contractor, any Subcontractor, or anyone directly or indirectly employed by or under the supervision of any of them. At the option of the Owner, the Contractor expressly agrees to defend against any claims or actions indemnified by this Section, whether such claims or actions are rightfully or wrongfully brought or filed. In such event, legal counsel provided by the Contractor shall be subject to the Owner's approval.

7.8.2 To the extent the Owner suffers or sustains any fines, penalties, or assessments as the result of any act or omission of the Contractor, the Contractor shall indemnify and hold harmless the Owner from same and the Contractor shall reimburse the Owner for any and all legal cost and expense, including attorneys' fees, incurred in connection with any such fines, penalties or assessments.

7.8.3 In claims against any person or entity indemnified under this Section 7.8 by an employee of the Contractor, a Subcontractor, any one directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under this Section 7.8 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

7.8.4 Nothing in this Section 7.8 shall require the Contractor to indemnify the Owner in the circumstances described in O.C.G.A. §§ 13-8-2(b) or (c).

7.9 Means, Methods, Techniques, Sequences, Procedures and Safety

7.9.1 The Contractor is fully responsible for, and shall have control over, all construction means, methods, techniques, sequences, procedures and safety, and shall coordinate all portions of the work required by the Contract Documents. Nothing contained herein, however, shall in any manner whatsoever relieve, release or discharge the Architect from any of its duties, responsibilities, obligations, or liabilities as set forth in its contract with the Owner, or as provided by law.

7.10 Separate Contracts

7.10.1 The Owner reserves the right to perform work on the premises with its own forces or by the use of other contractors. In such event, the Contractor shall fully cooperate with the Owner and such other contractors and shall coordinate, schedule and manage its work so as not to hinder, delay or otherwise interfere with the separate work of the Owner or other contractors.

7.11 Notice of Commencement

7.11.1 The Contractor shall file a NOTICE OF COMMENCEMENT with the Clerk of the Superior Court of Whitfield County, Georgia no later than fifteen (15) days after the Contractor physically commences work on the site. The Contractor shall furnish a copy of the NOTICE OF COMMENCEMENT to the Architect and to anyone else making a written request.

The NOTICE OF COMMENCEMENT shall contain the following information:

- (a) The name, address, and telephone number of the Contractor.
- (b) The name and location of the project being constructed and the legal description of the property upon which the improvements are being made.
- (c) The name and address of the true owner.
- (d) The name and address of the surety for the performance and payment bonds.
- (e) Any other requirements called for in the Official Code of Georgia Annotated - Sections 36-91-72 and 44-14-361.5.

7.12 Compliance with Federal and State Immigration Laws

7.12.1 The Contractor shall register and participate in the electronic verification ("E-Verify") of work authorization program operated by the U.S. Department of Homeland Security or any equivalent federal work authorization program operated by the U.S. Department of Homeland Security.

7.12.2 The Contractor shall verify that all new employees of the Contractor are in compliance with the Immigration Reform and Control Act of 1986, as required by state law, as codified at O.C.G.A. § 13-10-91, *et seq.* The Contractor shall provide the Owner

with all required affidavits verifying compliance with such applicable state and federal laws, including affidavits from Subcontractors and other performing the Work.

7.12.3 The Contractor agrees that, should it employ or contract with any Subcontractor(s) in connection with the physical performance of services pursuant to this Contract with the Owner, the Contractor will secure from such Subcontractor(s) an executed affidavit verifying the Subcontractor(s)'s compliance with O.C.G.A. § 13-10-91. The Contractor further agrees to maintain records of compliance by said Subcontractor(s) and their Tiers and provide a copy of each such verification to the Owner at the time the Subcontractor(s) is retained to perform such service.

7.12.4 The Contractor agrees to provide records, in a Excel Format, to the Owner providing the following information:

(a) Contractor Legal Name

(b) Contractor Address

(c) Contractor Federal work authorization program user number (E-Verify Number)

(d) Date of Contract between contractor and public employer.

7.12.5 The contractor also agrees to provide records for Subcontractors and Tiers in the same format and requiring the same information. This information is to be provided which requested by Owner.

ARTICLE 8. CONTRACT ADMINISTRATION

8.1 The Architect

8.1.1 The Architect for this project is KRH Architects Inc. In the event the Owner should find it necessary or convenient to replace the Architect, the Owner shall retain a replacement Architect and the status of the replacement Architect shall be that of the former Architect.

8.2 Architect's Administration

8.2.1 The Architect, unless otherwise directed by the Owner in writing, will perform those duties and discharge those responsibilities allocated to the Architect as set forth in this Contract. The Architect shall be the Owner's representative from the effective date of this Contract until final payment has been made. The Architect shall be authorized to act on behalf of the Owner only to the extent provided in this Contract.

8.2.2 The Owner and the Contractor shall communicate with each other in the first instance through the Architect.

8.2.3 The Architect shall be the initial interpreter of the requirements of the Drawings and Specifications and the judge of the performance thereunder by the Contractor. The Architect shall render written or graphic interpretations necessary for the proper execution or progress of the Work with reasonable promptness on request of the Contractor.

8.2.4 The Architect will review the Contractor's Applications for Payment and will certify to the Owner for payment to the Contractor, those amounts then due the Contractor as provided in this Contract.

8.2.5 The Architect shall have authority to reject Work which is defective or does not conform to the requirements of this Contract. If the Architect deems it necessary or advisable, the Architect shall have authority to require additional inspection or testing of the Work for compliance with Contract requirements.

8.2.6 The Architect will review and approve, or take other appropriate action as necessary, concerning the Contractor's submittals including Shop Drawings, Product Data and Samples. Such review, approval or other action shall be for the sole purpose of determining conformance with the design concept and information given through the Contract Documents. The Architect's action will be taken with such reasonable promptness as to cause no delay in the work or in the activities of the Owner, Contractor, or separate Contractor while allowing sufficient time in the Architect's professional judgment to permit adequate review.

8.2.7 The Architect will prepare Change Orders and may authorize minor changes in the Work by Field Order as provided elsewhere herein.

8.2.8 The Architect shall, upon written request from the Contractor, conduct inspections to determine the date of Substantial Completion and the date of Final Completion, will receive and forward to the Owner for the Owner's review and records, written warranties and related documents required by this Contract and will issue a final Certificate for Payment upon compliance with the requirements of this Contract. Written requests for interpretation (RFIs) required of the Architect received after noon on the last working day of the Architect's work week shall be acknowledged as received on the Architect's following normal working day.

8.2.9 The Architect's decisions in matters relating to aesthetic effect shall be final if consistent with the intent of this Contract.

8.2.10 The Architect shall have the discretion to specify the time within which the Contractor must correct or cure any defect or deficiency, or nonconformance with this Contract.

8.2.11 The Contractor shall make no claim for an extension of the Contract Time or for additional compensation arising out of or relating to any alleged failure by the Architect to timely take any action or render any decision unless and until the Contractor has first provided ten (10) days prior written notice to the Architect identifying therein the specific action or decision which the Contractor contends is necessary to avoid delay, or further

delay, to the Project. In the event the Architect takes the requested action, or renders the requested decision, within ten (10) days of the receipt of such notice, no claim for an extension of the Contract Time or for additional compensation arising out of, or relating to, such action or decision shall be made by the Contractor and any such claim is expressly waived.

8.2.12 THE DUTIES, OBLIGATIONS AND RESPONSIBILITIES OF THE CONTRACTOR UNDER THIS CONTRACT SHALL IN NO MANNER WHATSOEVER BE CHANGED, ALTERED, DISCHARGED, RELEASED, OR SATISFIED BY ANY DUTY, OBLIGATION, OR RESPONSIBILITY OF THE ARCHITECT. THE CONTRACTOR IS NOT A THIRD-PARTY BENEFICIARY OF ANY AGREEMENT BY AND BETWEEN THE OWNER AND THE ARCHITECT. IT IS EXPRESSLY ACKNOWLEDGED AND AGREED THAT THE DUTIES OF THE CONTRACTOR TO THE OWNER ARE INDEPENDENT OF, AND ARE NOT DIMINISHED BY, ANY DUTIES OF THE ARCHITECT TO THE OWNER.

8.3 Claims by the Contractor

8.3.1 All claims by Contractor shall be initiated by written notice and claim to the Owner and the Architect. The notice and claim shall be in such form as required by the Owner and same shall be signed by an officer of the Contractor under oath and under penalty of perjury. At a minimum, such notice and claim shall identify and describe the nature, scope, and location of the circumstance or condition giving rise to the claim; all items of Work impacted by the claim and an explanation of how the claim impacts such items of Work; applicable provisions of the Contract Documents; an estimate of any costs incurred and to be incurred as a result of the claim; and an estimate of any delays to the critical path of the Work resulting from the claim. Such written notice and claim must be furnished within seven (7) days after occurrence of the event, or the first appearance of the condition, giving rise to the claim. THE FAILURE BY THE CONTRACTOR TO PROVIDE THE WRITTEN NOTICE AND CLAIM AS PROVIDED IN THIS SECTION SHALL CONSTITUTE A WAIVER BY THE CONTRACTOR OF ANY SUCH CLAIM AGAINST THE OWNER.

8.3.2 Pending final resolution of any claim of the Contractor, the Contractor shall diligently proceed with performance of this Contract and the Owner shall continue to make payments to the Contractor in accordance with this Contract. The resolution of any claim under this Section 8.3 shall be reflected by a Change Order executed by the Owner, the Architect, and the Contractor.

8.3.3 Claims for Concealed and Unknown Conditions. If Contractor encounters (i) concealed and unknown conditions in the performance of the Work below the surface of the ground or in an existing structure at variance with the conditions indicated by this Contract, or (ii) unknown conditions of an unusual nature differing materially from those ordinarily encountered in the area and generally recognized as inherent in Work of the character provided for in this Contract, then the Contract Price shall be equitably adjusted by Change Order upon the written notice and claim by either party made within seven (7) days after the first observance of the condition. As a condition precedent to the Owner

having any liability to the Contractor for concealed or unknown conditions, the Contractor must give the Owner and the Architect written notice of, and an opportunity to observe, the condition prior to disturbing it. THE FAILURE BY THE CONTRACTOR TO PROVIDE THE WRITTEN NOTICE AND CLAIM AS PROVIDED IN THIS SECTION SHALL CONSTITUTE A WAIVER BY THE CONTRACTOR OF ANY CLAIM ARISING OUT OF OR RELATING TO SUCH CONCEALED OR UNKNOWN CONDITION.

8.3.4 Claims for Additional Costs. If the Contractor wishes to make a claim for an increase in the Contract Price, as a condition precedent to any liability of the Owner therefor, the Contractor shall give the Architect written notice of such claim within seven (7) days after the occurrence of the event, or the first appearance of the condition, giving rise to such claim. Such notice shall be given by the Contractor before proceeding to execute any additional or changed Work. THE FAILURE BY THE CONTRACTOR TO PROVIDE SUCH NOTICE AND TO GIVE SUCH NOTICE PRIOR TO EXECUTING THE WORK SHALL CONSTITUTE A WAIVER OF ANY CLAIM FOR ADDITIONAL COMPENSATION.

8.3.4.1 Limitations on Liability. In connection with any claim by the Contractor against the Owner, any liability of the Owner shall be strictly limited to direct costs incurred by the Contractor and shall in no event include indirect costs or consequential damages of the Contractor. Furthermore, in no event shall the Owner be liable to the Contractor for any claim for home-office overhead, loss of efficiency or productivity, loss of use of capital, loss of bonding capacity, or loss of business opportunity. Furthermore, the Owner shall have no liability for any claim for acceleration or compression of the schedule. The Owner shall not be liable to the Contractor for claims of third parties, including Subcontractors. The Contractor shall not serve as a conduit for the claims of Subcontractors against the Owner, and any provision in any contract between the Contractor and any Subcontractor pursuant to which the Contractor is obligated to present to the Owner any claim of any Subcontractor shall be invalid.

8.3.5 Claims for Additional Time. If the Contractor 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 Work, unusual delay in transportation, unusually adverse weather conditions not reasonably anticipatable, fire or any causes beyond the Contractor's control, then the date for achieving Substantial Completion of the Work shall be extended upon the written notice and claim of the Contractor to the Owner and the Architect for such reasonable time as the Architect may determine. Any notice and claim for an extension of time by the Contractor shall be made not more than seven (7) days after the occurrence of the event or the first appearance of the condition giving rise to the claim and shall set forth in detail the Contractor's basis for requiring additional time in which to complete the Project. In the event the delay to the Contractor is a continuing one, only one notice and claim for additional time shall be necessary, provided such notice expressly states the Contractor expects the delay to be continuing and states the basis for such expectation. IF THE CONTRACTOR FAILS TO MAKE SUCH CLAIM

AS REQUIRED IN THIS SECTION, ANY CLAIM FOR AN EXTENSION OF TIME SHALL BE WAIVED.

8.3.6 Extension of Contract Time for Unusually Adverse Weather Conditions Not Reasonably Anticipated

8.3.6.1 Pursuant to the provisions of Section 8.3.5, the Contract Time may be extended upon written notice and claim of the Contractor to the Owner and the Architect as set forth in such Section and as further set forth herein. It is, however, expressly agreed that the time for completion as stated in the Contract Documents includes due allowance for calendar days on which work cannot be performed out-of-doors. For purposes of this Contract, and for purposes of extensions of Contract Time, the Contractor agrees that it anticipates adverse weather sufficient to prevent work in accordance with the schedule set forth below, and the Contractor further agrees that unless it encounters actual adverse weather in excess of those days set forth below, it shall not make, nor shall it be entitled to, any extension of the Contract Time:

<u>Month</u>	<u>Days</u>	<u>Month</u>	<u>Days</u>	<u>Month</u>	<u>Days</u>
January	12	May	8	September	7
February	10	June	8	October	9
March	9	July	11	November	9
April	8	August	9	December	10

8.3.6.1 Furthermore, in addition to the notice requirements set forth in the aforesaid Section 8.3.5, the Contractor agrees that it shall provide written notice to the Owner and the Architect on the day of any adverse weather not anticipated and for which a request for a time extension has been, or will be, made. Said notice shall state with particularity a description of the adverse weather as well as a description of the nature and extent of any delay caused by such weather. Receipt of this notice by the Owner and the Architect is a condition precedent to the submission of any claim for an extension of time as provided by Section 8.3.5. Furthermore, as required by Section 8.3.5, the Contractor shall submit a written claim for extension of time within seven (7) days after the occurrence of the adverse weather and such claim shall be supported by such documentation including, but not limited to, official weather reports, as the Owner or the Architect may required. To the extent that any of the terms and conditions set forth in Section 8.3.6 are in conflict with any of the terms and conditions of Section 8.3.5, the terms and conditions of Section 8.3.6 shall govern and control. THE FAILURE BY THE CONTRACTOR TO COMPLY WITH ALL REQUIREMENTS OF SECTION 8.3.6 SHALL PRECLUDE ANY EXTENSION OF THE CONTRACT TIME FOR ADVERSE WEATHER.

8.3.6.2 NOTWITHSTANDING ANY OTHER PROVISION OF THIS CONTRACT, THE PARTIES SPECIFICALLY AGREE THAT ANY AND ALL WEATHER DELAYS SHALL BE NONCOMPENSABLE AND THE SOLE AND EXCLUSIVE REMEDY OF THE

CONTRACTOR IN THE EVENT OF ANY SUCH DELAY IS AN EXTENSION OF THE CONTRACT TIME AS PROVIDED IN THIS SECTION 8.3.6.

8.3.7 Legal Action by the Contractor: As a condition precedent to the filing of any legal action by the Contractor against the Owner arising out of or relating to this Contract, the Contractor shall first provide the Owner thirty (30) days prior written notice of its intent to file such action. Such notice shall include an identification of the anticipated parties to said action and a description of all anticipated claims and causes of action to be asserted in said action. Any legal action under this Contract filed by either the Contractor or the Owner shall be filed in the Superior Court of Whitfield County, Georgia, and said Court shall be the exclusive venue for any such action. The Contractor expressly agrees that it shall be subject to the jurisdiction and venue of said Court for any such action.

ARTICLE 9. SUBCONTRACTORS

9.1 Definition

9.1.1 A Subcontractor is an entity which has a direct contract with the Contractor to perform a portion of the Work.

9.2 Award of Subcontracts

9.2.1 The Contractor shall employ and utilize the following designated Subcontractors for the elements of the work identified. In no event may the Contractor substitute Subcontractors identified herein after the execution hereof for convenience. Any substitution of Subcontractors must be for cause reasonably demonstrated to the Owner's satisfaction:

<u>Subcontractor</u>	<u>Work</u>

9.2.2 Upon execution of the Contract, the Contractor shall furnish the Owner, in writing, the names of persons or entities proposed by the Contractor to act as Subcontractors on the Project. The Owner shall promptly reply to the Contractor, in writing, stating any objections the Owner may have to any of the proposed Subcontractors. The Contractor shall not enter into a Subcontract with a proposed Subcontractor with reference to whom the Owner has made timely objection. The Contractor shall not be required to Subcontract with any party to whom the Contractor has objection.

9.2.3 All subcontracts shall afford the Contractor rights against the Subcontractor which correspond to those rights afforded to the Owner against the Contractor herein, including those rights afforded to the Owner by Section 12.2.1 below.

9.3 Verification of Subcontractor Payments

9.3.1 The Owner may in its discretion verify with any Subcontractor the status of payments received or due from the Contractor. Nothing contained herein shall in any manner limit or restrict any other right of the Owner to communicate with a Subcontractor.

ARTICLE 10. CHANGES IN THE WORK

10.1 Changes Permitted

10.1.1 Changes in the Work within the general scope of this Contract, consisting of additions, deletions, revisions, or any combination thereof, may be ordered without invalidating this Contract, by Change Order or by Field Order.

10.1.2 Changes in the Work shall be performed under applicable provisions of this Contract and the Contractor shall proceed promptly with such changes.

10.2 Change Order Defined

10.2.1 Change Order shall mean a written order to the Contractor executed by the Owner and the Architect, issued after execution of this Contract, authorizing and directing a change in the Work or an adjustment in 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.

10.3 Changes in the Contract Price

10.3.1 Any change in the Contract Price resulting from a Change Order shall be determined as follows: (a) by mutual agreement between the Owner and the Contractor as evidenced by (1) the change in the Contract Price being set forth in the Change Order, (2) such change in the Contract Price, together with any conditions or requirements related thereto, being initialed by both parties, and (3) the Contractor's execution of the Change Order, or (b) if no mutual agreement occurs between the Owner and the Contractor, then, as provided in Section 10.3.2.

10.3.2 If no mutual agreement occurs between the Owner and the Contractor as contemplated in Section 10.3.1, the change in the Contract Price, if any, shall then be determined by the Architect on the basis of the reasonable expenditures or savings of those performing, deleting or revising the Work attributable to the change, including, in the case of an increase or decrease in the Contract Price, a reasonable allowance for direct job site overhead and profit. In such case, the Contractor shall present, in such form and with such content as the Owner or the Architect requires an itemized accounting

of such expenditures or savings, plus appropriate supporting data for inclusion in a Change Order. Reasonable expenditures or savings shall be limited to the following: reasonable costs of materials, supplies, or equipment including delivery costs, reasonable costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance, reasonable rental costs of machinery and equipment exclusive of hand tools whether rented from the Contractor or others, reasonable costs of premiums for all bonds and insurance, permit fees, and sales, use or other taxes related to the Work, and reasonable cost of direct supervision and jobsite field office overhead directly attributable to the change. In the event the Contractor performs the Work required by Change Order with its own forces, and not the forces of a Subcontractor, the overhead and profit due the Contractor for such work shall be twenty (20) percent. In the event the Change Order Work is performed by one or more Subcontractors, the Contractor's overhead and profit shall be seven and one-half (7- ½) percent. In no event shall any expenditure or savings associated with the Contractor's home office or other non-jobsite overhead expense be included in any change in the Contract Price. Pending final determination of reasonable expenditures or savings to the Owner, payments on account shall be made to the Contractor on the Architect's Certificate for Payment.

10.3.3 If unit prices are provided in the Contract, and if the quantities contemplated are so changed in a proposed Change Order that application of such unit prices to the quantities of Work proposed will cause substantial inequity to the Owner or to the Contractor, the applicable unit prices shall be equitably adjusted.

10.4 Effect of Executed Change Order

10.4.1 The execution of a Change Order by the Contractor shall constitute conclusive evidence of the Contractor's agreement to the ordered changes in the Work, this Contract as thus amended, the Contract Price and the Contract Time. The Contractor, by executing the Change Order, waives and forever releases any claim against the Owner for additional time or compensation for matters relating to or arising out of or resulting from the Work included within or affected by the executed Change Order.

10.5 Notice to Surety; Consent

10.5.1 The Contractor shall notify and obtain the consent and approval of the Contractor's surety with reference to all Change Orders if such notice, consent or approval are required by the Contractor's surety or by law. The Contractor's execution of the Change Order shall constitute the Contractor'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.

ARTICLE 11. UNCOVERING AND CORRECTING WORK

11.1 Uncovering Work

11.1.1 If any of the Work is covered contrary to the Architect's request or to any provisions of this Contract, it shall, if required by the Architect or the Owner, be uncovered for the Architect's inspection and shall be properly replaced at the Contractor's expense without change in the Contract Time.

11.1.2 If any of the Work is covered not in contradiction to the Architect's request or to any provisions of this Contract, nonetheless, it shall, if required by the Architect or Owner, be uncovered for the Architect's inspection. If such Work conforms strictly with this Contract, costs of uncovering and proper replacement shall by Change Order be charged to the Owner. If such Work does not strictly conform with this Contract, the Contractor shall pay the costs of uncovering and proper replacement.

11.2 Correcting Work

11.2.1 The Contractor shall immediately proceed to correct Work rejected by the Architect as defective or failing to conform to this Contract. All such rejected Work shall be corrected in sufficient time so as not to delay either Substantial Completion or Final Completion of the Project, and in any event such rejected Work shall be corrected within thirty (30) days after issuance of any written rejection notice by the Architect. In the event the Work is not fully corrected within three (3) days from the date of said rejection notice, the Contractor shall submit to the Owner and the Architect, within seven (7) days of said notice, a detailed written plan of remediation in such form, and in such detail, as the Owner may require. At a minimum, such plan of remediation shall include an identification and location of the Work to be remediated; a detailed description of the process and procedure proposed for the remediation; the name of each Subcontractor involved in performing any of the remediation Work; the proposed schedule for the remediation including start date, hours of operation, and finish date; and, the name of each individual responsible for the management of such Work. The Contractor shall pay all costs and expenses associated with correcting such rejected Work, including any additional testing and inspections, and reimbursement to the Owner for the Architect's services and expenses made necessary thereby.

11.2.2 If within one (1) year after Final Completion of the Work, any of the Work is found to be defective or not in accordance with this Contract, the Contractor shall correct it promptly upon receipt of written notice from the Owner. This obligation shall survive final payment by the Owner and termination of this Contract. With respect to Work first performed and completed after Substantial Completion, this one-year obligation to specifically correct defective and nonconforming Work shall be extended by the period of time which elapses between Substantial Completion and completion of the subject Work.

11.2.3 Nothing contained in this Section shall establish any period of limitation with respect to other obligations which the Contractor has under this Contract. Establishment of the one-year time period in Section 11.2.2 relates only to the duty of the Contractor to specifically correct the Work.

11.3 Owner May Accept Defective or Nonconforming Work

11.3.1 If the Owner chooses to accept defective or nonconforming Work, the Owner may do so, but only if such acceptance is in writing and executed by Owner. In such event, the Contract Price shall be reduced by the greater of (a) the reasonable cost of removing and correcting the defective or nonconforming Work, and (b) the difference between the fair market value of the Project as constructed and the fair market value of the Project had it not been constructed in such a manner as to include defective or nonconforming Work. If the remaining portion of the unpaid Contract Price, if any, is insufficient to compensate the Owner for its acceptance of defective or nonconforming Work, the Contractor shall, upon written demand from the Owner, pay the Owner such remaining compensation for accepting defective or nonconforming Work.

ARTICLE 12. CONTRACT TERMINATION

12.1 Termination by the Contractor

12.1.1 If the Work is stopped for a period of ninety (90) days by an order of any court or other public authority, or as a result of an act of the Government (other than Owner), through no fault of the Contractor or any person or entity working directly or indirectly for the Contractor, the Contractor may, upon ten (10) days' written notice to the Owner and the Architect, terminate performance under this Contract and recover from the Owner payment for the actual reasonable expenditures of the Contractor (as limited in Section 10.3.2 above) for all Work executed and for materials, equipment, tools, construction equipment and machinery actually purchased or rented solely for the Work, less any salvage value of any such items.

12.1.2 If the Owner shall persistently or repeatedly fail to perform any material obligation to the Contractor for a period of thirty (30) days after receiving written notice from the Contractor of its intent to terminate hereunder, the Contractor may terminate performance under this Contract by written notice to the Architect and the Owner. In such event, the Contractor shall be entitled to recover from the Owner as though the Owner had terminated the Contractor's performance under this Contract for convenience pursuant to Section 12.2.1 hereunder.

12.2 Termination by the Owner

12.2.1 For Convenience

12.2.1.1 The Owner may for any reason whatsoever, or for no reason, terminate performance under this Contract by the Contractor for convenience. The Owner shall give written notice of such termination to the Contractor specifying when termination becomes effective.

12.2.1.2 The Contractor shall incur no further obligations in connection with the Work and the Contractor shall stop Work when such termination becomes effective. The Contractor shall also terminate outstanding orders and subcontracts. The Contractor shall settle the liabilities and claims arising out of the termination of subcontracts and

orders. The Owner may direct the Contractor to assign the Contractor's right, title and interest under terminated orders or subcontracts to the Owner or its designee.

12.2.1.3 The Contractor shall transfer title and deliver to the Owner such completed or partially completed Work and materials, equipment, parts, fixtures, information and Contract rights as the Contractor has.

12.2.1.4 Within sixty (60) days after its termination for convenience, the Contractor shall submit a termination claim to the Owner and the Architect specifying the amounts due because of the termination for convenience together with costs, pricing or other data required by the Architect. The claim shall be signed by an officer of the Contractor under oath and under penalty of perjury. IF THE CONTRACTOR FAILS TO FILE A COMPLETE AND PROPER TERMINATION CLAIM WITHIN THE TIME REQUIRED HEREIN ANY CLAIM FOR TERMINATION SHALL BE DEEMED WAIVED AND NO FURTHER SUMS SHALL BE DUE THE CONTRACTOR.

12.2.1.5 The Owner and the Contractor may agree to the compensation, if any, due to the Contractor hereunder.

12.2.1.6 Absent agreement to the amount due to the Contractor, and provided Contractor has submitted its claim in accordance with the requirements set forth hereinabove, the Owner shall pay the Contractor the following amounts:

- (a) Contract prices for labor, materials, equipment and other services accepted under this Contract;
- (b) Reasonable costs incurred in preparing to perform and in performing the terminated portion of the Work, and in terminating the Contractor's performance, plus a fair and reasonable allowance for overhead and profit thereon (such profit shall not include anticipated profit or consequential damages); provided, however, that if it appears that the Contractor 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;
- (c) Reasonable costs of settling and paying claims arising out of the termination of subcontracts or orders pursuant to Section 12.2.1.2. These costs shall not include amounts paid in accordance with other provisions hereof.

The total sum to be paid the Contractor under this Section 12.2.1 shall not exceed the total Contract Price, as properly adjusted, reduced by the amount of payments otherwise made, and shall in no event include duplication of payment.

12.2.2 For Cause

12.2.2.1 If the Contractor persistently or repeatedly refuses or fails to prosecute the Work in a timely manner, supply enough properly skilled workers, supervisory personnel or proper equipment or materials, or if it fails to make prompt payment to Subcontractors or for materials or labor, or persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise is guilty of a substantial violation of a material provision of this Contract, then the Owner may by written notice to the Contractor, without prejudice to any other right or remedy, terminate the employment of the Contractor and take possession of the site and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor and may finish the Work by whatever methods it may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the Work is finished.

12.2.2.2 If the unpaid balance of the Contract Price exceeds the cost of finishing the work, including compensation for the Architect's additional services and expenses made necessary thereby, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. This obligation for payment shall survive the termination of the Contract.

12.2.2.3 In the event the employment of the Contractor is terminated by the Owner for cause pursuant to Section 12.2.2 and it is subsequently determined by a Court of competent jurisdiction that such termination was without cause, such termination shall thereupon be deemed a Termination for Convenience under Section 12.2.1 and the provisions of Section 12.2.1 shall apply.

ARTICLE 13.

OWNER'S RIGHT TO SUSPEND CONTRACTOR'S PERFORMANCE

- 13.1** The Owner shall have the right at any time to direct the Contractor to suspend its performance, or any designated part thereof, for any reason whatsoever, or without reason, for a cumulative period of up to sixty (60) calendar days. If any such suspension is directed by the Owner, the Contractor shall immediately comply with same.
- 13.2** In the event the Owner directs a suspension of performance under this ARTICLE 13, through no fault of the Contractor, the Owner shall pay the Contractor as full compensation for such suspension the Contractor's reasonable costs, actually incurred and paid, of:

- (a) demobilization and remobilization, including such costs paid to Subcontractors;
- (b) preserving and protecting work in place;
- (c) storage of materials or equipment purchased for the Project, including insurance thereon;
- (d) performing in a later, or during a longer, time frame than that contemplated by this Contract.

ARTICLE 14. INSURANCE

The Contractor shall not commence work until it has obtained all the insurance required in this Article, and such insurance has been approved by the Owner.

14.1 Policies and Coverage

14.1.1 The Contractor shall obtain and maintain for the term of the Contract the following policies and coverage:

- (a) Comprehensive or Commercial Form General Liability Insurance, on an occurrence basis, covering work done or to be done by or on behalf of the Contractor and providing insurance for bodily injury, personal injury, property damage, and contractual liability. The aggregate limit shall apply separately to the Project.
- (b) Business Automobile Liability Insurance on an occurrence basis, covering owned, hired, and non-owned automobiles used by or on behalf of the Contractor and providing insurance for bodily injury, property damage, and contractual liability. Such insurance shall include coverage for uninsured and underinsured motorists.
- (c) Worker's Compensation including Employers Liability Insurance
- (d) Except as otherwise provided in Section 14.1.2, Course of Construction Insurance covering all risk of loss, maintained at one hundred percent of the completed value based on the insurable portion of the work, including materials at the project site, stored off the project site, and in transit.
- (e) Any other insurance as required by law.

14.1.2 Within ten (10) calendar days after the effective date hereof, the Contractor shall provide the Owner a quote for Course of Construction Insurance required hereunder. Thereafter, Owner shall have the right, but not the obligation, to procure its own insurance covering the same or similar risks. If Owner so elects, it will notify the Contractor in writing

of its decision, the Contractor shall not be required to procure such insurance hereunder, and the parties will execute a deductive Change Order for the amount of Contractor's quote for such insurance.

14.1.3 The Contractor shall obtain the following policies and coverage should the work involve hazardous materials: Environmental Impairment Liability Insurance

14.2 Verification of Coverage

14.2.1 The Contractor shall submit certificates of insurance and separate letters of endorsements to the policies of insurance required by the Contract to the Owner as evidence of the insurance coverage, naming the Owner's officers, directors, employees, agents, volunteers and assigns as additional insured.

14.2.1.1 The scope of coverage and deductible shall be shown on the certificate of insurance. The certificates of insurance and endorsements shall provide for no cancellation or modification of coverage without thirty days written notice to the Owner. Renewal certifications and endorsements shall be timely filed by the Contractor for all coverage until the work is accepted as complete. The Owner's review of any certificate of insurance shall not relieve the Contractor of its obligation to procure the insurance required hereunder. The Owner reserves the right to require the Contractor to furnish complete, certified copies of all required insurance policies.

14.3 Waiver of Subrogation

14.3.1 The Owner and Contractor 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 contractors provided by the Owner, 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 Article, or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Contractor as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors provided herein, 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 policy 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.

14.4 Insurance Provisions

14.4.1 The insurance policies shall contain, or be endorsed to contain, the following provisions:

- (a) For the general and automobile liability policies, the Owner, its officers, employees, representatives, volunteers, and agents are to be covered as additional insureds.
- (b) For any claims related to the Work, the Contractor's insurance coverage shall be primary insurance as respects to the Owner, its officers, employees, representatives, volunteers, and agents. Any insurance or self-insurance maintained by the Owner, its officers, employees, representatives, volunteers, and agents shall be in excess of the Contractor's insurance and shall not contribute with it.
- (c) Each insurance policy required by this Article shall state that coverage shall not be canceled by either the Contractor or the insurance carrier, except after thirty days prior written notice by certified mail, return receipt requested, has been given to the Owner.
- (d) The Owner, its officers, employees, representatives, volunteers, and agents shall not by reason of their inclusion as additional insureds incur liability to the insurance carriers for payment of premiums for such insurance.
- (e) Course of construction coverage shall contain the following provisions:
- 1 The Owner shall be named as loss payee;
 - 2 The insurer shall waive all rights of subrogation against the Owner; and
 - 3 If required in writing by a party in interest, the Contractor as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Contractor's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Contractor shall deposit in a separate account proceeds so received, which the Contractor shall distribute in accordance with such agreement as the parties in interest may reach. If after such loss no other special agreement is made, replacement of damaged property shall be covered by appropriate Change Order.

14.4.2 Partial occupancy or use 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 Contractor 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.

14.5 Amount of Insurance

14.5.1 For all projects, other than those involving hazardous materials, the insurance furnished by the Contractor under this Article shall provide coverage in amounts not less than the following, unless a different amount is stated in the Supplementary General Conditions.

(a) Comprehensive or Commercial form General Liability Insurance - Limits of Liability

(i) \$2,000,000.00 General Aggregate

(ii) \$1,000,000.00 Each Occurrence - combined single limit for bodily injury and property damage.

(b) Business Automobile Liability Insurance - Limits of Liability

(i) \$1,000,000.00 Each Accident- combined single limit for bodily injury and property damage to include uninsured and underinsured motorist coverage.

(c) Workers' Compensation limits as required by law with Employers Liability limits of \$1,000,000.00.

(d) Course of Construction Insurance - 100% of the completed value of the work

14.5.2 For projects involving hazardous materials, only the Contractor and its hazardous materials Subcontractors shall provide coverage in amounts not less than the following, unless a different amount is stated in the Supplementary General Conditions:

(a) Comprehensive or Commercial form General Liability Insurance - Limits of Liability

(i) \$10,000,000.00 General Aggregate

(ii) \$5,000,000.00 Each Occurrence - combined single limit for bodily injury and property damage.

(b) Business Automobile Liability Insurance - Limits of Liability

(i) \$1,000,000.00 Each Accident- combined single limit for bodily injury and property damage to include uninsured and underinsured motorist coverage.

(c) Hazardous material transporter services must also have:

(i) MCS-90 endorsement

(ii) Sudden & Accidental Pollution endorsement-Limits of Liability*

1 \$2,000,000.00 Each Occurrence

2 \$2,000,000.00 General Aggregate

*A higher limit on the MCS-90 endorsement required by law must be matched by the Sudden & Accidental Pollution Insurance.

(d) Workers' Compensation limits as required by law with employers Liability limits of \$1,000,000.00.

(e) Course of Construction Insurance-100% of the completed value of the work

(f) Environmental Impairment (pollution) Liability Insurance - Limits of Liability:

(i) \$10,000,000.00 General Aggregate

(ii) \$5,000,000.00 Each Occurrence-combined single limit for bodily injury and property damage, including clean-up costs.

14.6 Acceptability of Insurers

14.6.1 Insurers shall be licensed by the State of Georgia to transact insurance and shall hold a current A.M. Best's rating of A:VII; or shall be a carrier otherwise acceptable to the Owner.

14.7 Subcontractor's Insurance

14.7.1 The Contractor shall ensure that its Subcontractors are covered by insurance of the type and the amounts required by this Article. Contractor shall not allow any Subcontractor to commence work on its subcontract until the insurance has been obtained.

14.8 Miscellaneous

14.8.1 Any deductible under any policy of insurance required in this Article shall be Contractor's liability.

14.8.2 Acceptance of certificates of insurance by the Owner shall not limit the Contractor's liability under the Contract.

14.8.3 In the event the Contractor does not comply with these insurance requirements, the Owner may, at its option, provide insurance coverage to protect the Owner. The cost of the insurance shall be paid by the Contractor and, if prompt payment is not received, may be deducted from Contract sums otherwise due the Contractor.

14.8.4 If the Owner is damaged by the failure of the Contractor to provide or maintain the required insurance, the Contractor shall pay the Owner for all such damages.

14.8.5 The Contractor's obligations to obtain and maintain all required insurance are not delegable duties under this Contract.

ARTICLE 15. MISCELLANEOUS

15.1 Special Stipulations

15.1.1 Governing Law. The Contract shall be governed by the law of the State of Georgia.

15.1.2 Independent Contractor. The Contractor shall perform the services under this Contract as an independent contractor and nothing contained herein shall be construed to be inconsistent with this relationship or status. Nothing in this Contract shall be interpreted or construed to constitute Contractor or any of its agents or employees to be the agent, employee, or representative of Owner.

15.2 Conflicts of Interest

15.2.1 The Contractor certifies that to the best of its knowledge no circumstances exist which will cause a conflict of interest in performing the services required by this Contract, that no employee of Owner, nor any member thereof, nor any public agency or official affected by this Contract, has any pecuniary interest in the business of the Contractor or its Subcontractors and that no person associated with the Contractor or its Subcontractors has any interest that would conflict in any manner or degree with the performance of this Contract.

15.2.2 Should Contractor become aware of any circumstances which may cause a conflict of interest during the term of this Contract, Contractor shall immediately notify Owner. If Owner determines that a conflict of interest exists, Owner may require that Contractor take action to remedy the conflict of interest or terminate the Contract without liability. Owner shall have the right to recover any fees paid for services rendered by Contractor which were performed while a conflict of interest existed if Contractor had knowledge of the conflict of interest and did not notify Owner within one week of becoming aware of the existence of the conflict of interest.

15.2.3 Contractor warrants that Contractor and Contractor's Subcontractors have not employed or retained any company or person other than a bona fide employee, working solely for Contractor or its Subcontractor(s) to solicit or secure this Contract and that Contractor and Contractor's Subcontractor(s) have not paid or agreed to pay any person, company, corporation, individual, or firm other than a bona fide employee working solely for Contractor or its Subcontractor(s) any fee, commission, percentage, gift or other consideration contingent upon or resulting from the award of this Contract. For any breach or violation of this provision, Owner shall have the right to terminate the Contract without liability and, at its discretion, to deduct from the price, or otherwise recover, the full amount of such fee, commission, percentage, gift, payment or consideration.

15.2.4 Contractor shall include the terms and conditions of Section 15.2 in all Subcontractor agreements for work to be performed under this Contract.

15.2.5 Equal Employment Opportunity. During the performance of this Contract, Contractor agrees as follows: (i) Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex or national origin; (ii) Contractor will, in all solicitations or advertisements for employees placed by qualified applicants, receive consideration for employment without regard to race, creed, color, sex or national origin; (iii) Contractor will cause the foregoing provisions to be inserted in all subcontracts for any work covered by the Contract so that such provision will be binding upon each Subcontractor, provided that the foregoing provision shall not apply to contracts or subcontracts for standard commercial supplies of raw materials.

15.3 Successors and Assigns

15.3.1 The Owner and Contractor bind themselves, their successors, assigns and legal representatives to the other party hereto and to successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in this Contract. The Contractor shall not assign this Contract without written consent of the Owner.

15.4 Surety Bonds

15.4.1 The Contractor 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 Contractor shall incorporate by reference the terms of this 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 Contractor, 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 Contractor shall be in form suitable to the Owner and shall be executed by a surety, or sureties, reasonably suitable to the Owner. At the delivery of such bonds to the Owner, the Contractor shall also furnish in writing to the Owner the name, address, telephone number, email address, and facsimile number of the person employed by the surety to whom any claims, notices, requests, or other communications from the Owner are to be submitted. If requested by the Owner or the Architect, the Contractor shall procure and furnish to the Owner and Architect the written consent of surety to any proposed Change Order, contract payment or other contemplated action under this Contract. The Contractor shall provide a contact name, phone number and address at signing of this contract.

15.5 Entire Agreement

15.5.1 This Contract constitutes the sole and entire agreement between the parties. No representations either oral or written not incorporated herein shall be binding on the parties. No amendment or modification of this Contract shall be enforceable unless same is in writing duly executed by the parties. In the event any term, condition, clause or provision of this Contract is held or determined to be invalid by any Court of competent

jurisdiction, any and all remaining terms, conditions, clauses and provisions of the Contract shall remain in full force and effect.

This Contract is executed under seal on the date set forth hereinbelow.

OWNER:
City of Dalton, GA

CONTRACTOR:

(Typed Name)

By:
(Signature)

By:
(Signature)

Annalee Sams – Mayor
300 W. Waugh Street
Dalton, GA 30720

(Printed Name, Title and Address)

(Printed Name, Title and Address)

(Date of Execution)
Approved as to Form:

(Date of Execution)

SECTION 00100 - AFFIDAVIT

EXHIBIT / TAB "J"

The Undersigned, after being duly sworn, deposes and states as follows:

1.

The Undersigned is over the legal age of majority and is duly competent to execute this Affidavit. The Undersigned is _____ of _____, a general contractor (hereinafter "Contractor"), which maintains its principal place of business at _____. The Undersigned is expressly authorized to execute this Affidavit on behalf of Contractor. The Undersigned has personal knowledge of all facts set forth herein and said facts are true and correct. This Affidavit is executed in accordance with the provisions of O.C.G.A. § 13-10-91 and is submitted in connection with Contractor's proposal to construct for the City of Dalton (hereinafter "the City") a project known as the: "A New Building for Dalton Police Department", located at 301 Jones Street, Dalton GA 30720 (the "Project").

2.

The Undersigned affirms and attests that Contractor has registered with, is authorized to use, and uses the federal work authorization program as said program is defined in the above-referenced provision of Georgia law. The user identification number of Contractor for said program is _____ and the date of authorization for Contractor to use said program is _____. In the event Contractor is awarded a contract for the Project, it will continue to use the federal work authorization program throughout the contract period.

3.

In the event Contractor is awarded a contract for the Project, it will contract for the physical performance of services in satisfaction of such contract only with subcontractors who present an affidavit to Contractor with the same information required in Paragraph 3 hereinabove.

Executed this _____ day of _____, 20____.

Contractor: _____

By: _____

Title: _____

Sworn and subscribed before me
this _____ of _____, 20____.

Commission Expiration

NOTARY PUBLIC

SECTION 00110 - PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS that
[Name of Contractor] (hereinafter called the **“Principal”**), and
[Name of Surety Company], (hereinafter called the **“Surety”**), are held and firmly bound unto THE CITY OF
DALTON (the **“City”**), (hereinafter called the **“Obligee”**), for the use and benefit of any **“Claimant”** as hereinafter
defined in the sum of _____ (\$
) , lawful money of the United States of America, for the payment of which the Principal and the Surety bind
themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these
presents.

WHEREAS, the Principal has entered, or is about to enter, into a certain written agreement with the Obligee,
dated _____, (hereinafter the **“Agreement”**), for Construction of a project known as: “A New
Building for Dalton Police Department”, located at 301 Jones Street, Dalton GA 30720 (the **“Project”**). (the
“Project”).

NOW THEREFORE, the condition of this obligation is such, that if the Principal shall promptly make
payment to any Claimant, as hereinafter defined, for all labor, services and materials used or reasonably required for
use in the performance of the Agreement, then this obligation shall be void; otherwise to remain in full force and
effect.

A **“Claimant”** shall be defined herein as any contractor, subcontractor, person, party, partnership, corporation or
other entity furnishing labor, services, or materials used or reasonably required for use in the performance of the
Agreement, or construction of the Project, without regard to whether such labor, services or materials were sold,
leased or rented, and without regard to whether such Claimant is or is not in privity of contract with the Principal or
any contractor or subcontractor performing work on the Project. Any entity entitled to protection of a payment bond
under Georgia law shall be deemed a **“Claimant”** under this bond.

The surety is herein bound and obligated for all obligations of a surety as set forth in O.C.G.A. §§ 36-91-70
through and including O.C.G.A. § 36-91-75.

In the event of any claim made by a Claimant against the Obligee, or the filing of a lien against the property of
the Obligee affected by the Agreement, the Surety shall either settle or resolve the claim, or remove any such lien by
bond, or otherwise take such action as provided in the Agreement.

This bond is intended to conform to all applicable statutory requirements. Any applicable
requirement of any applicable statute that has been omitted from this bond shall be deemed to be included herein as
set forth at length. If any provision of this bond is held by a court competent jurisdiction to be in conflict with any
applicable statute, then the provision of said statute shall govern and the remainder of this bond that is not in conflict
therewith shall continue in full force and effect.

IN WITNESS WHEREOF, the Principal and Surety have hereunto affixed their corporate seals and caused
this obligation to be signed by their duly authorized officers on this _____ day of
_____, 2024.

[NAME OF PRINCIPAL]

BY: _____ [Seal]

Witness:

Date: _____

[NAME OF SURETY]

BY: _____ [Seal]

Witness:

Date: _____

Approved:

Date: _____ BY: _____

[ATTACH SURETY'S POWER OF ATTORNEY]

SECTION 00120 - PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS that _____
_____ [Name of Contractor] (hereinafter called the
“Principal”) and _____ [Name of Surety Company] (hereinafter called the
“Surety”) are held and firmly bound unto THE CITY OF DALTON (the “City”), (hereinafter called the “Obligee”) in the amount of _____ (\$ _____), lawful money of the United States of America, for the payment whereof the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered, or is about to enter, into a certain written agreement with the Obligee dated _____, (hereinafter the “Agreement”), for Construction of a project known as: “A New Building for Dalton Police Department”, located at 301 Jones Street, Dalton GA 30720 (the “Project”). Dalton GA 30721 (the “Project”).

NOW THEREFORE, the conditions of this obligation are as follows:

1.

That if the Principal shall fully and completely perform each and all of the terms, provisions and requirements of the Agreement, including and during the period of any warranties or guarantees required thereunder, and all modifications, amendments, changes, deletions, additions, and alterations thereto that may hereafter be made; and if the Principal and the Surety shall indemnify and hold harmless the Obligee from any and all losses, liability and damages, claims, judgments, liens, costs and fees of every description, arising under the Agreement, whether imposed by law or equity, which may be caused by failure or default on the part of the Principal in the performance of any or all of the terms, provisions and requirements of the Agreement, including all modifications, amendments, changes, deletions, additions, and alterations thereto and any warranties or guarantees required thereunder, then this obligation shall be void; otherwise to remain in full force and effect.

2.

In the event of a failure of performance of the Agreement by the Principal, which shall include, but not be limited to, any breach or default of the Agreement, the Surety, upon demand by the Oblige, shall undertake and complete such required performance and cure any breach or default of the Agreement.

The Surety shall commence performance of its obligations and undertakings hereunder no later than forty-five (45) days after written notice from the Oblige to the Surety; and, if the Surety fails to commence performance as required herein within such period of time, or if the Surety otherwise breaches its obligations to the Oblige under this Bond and the Agreement, the Surety shall be liable to the Oblige for the Oblige's actual damages, including all costs of litigation and attorneys' fees, plus any penalties, as may be provided by law.

The means, methods or procedure by which the Surety undertakes to perform its obligations under this Bond shall be subject to the advance written approval of the Oblige, said approval not to be unreasonably withheld;

If the Surety fails or refuses to perform as provided above, or if the Oblige and the Surety cannot agree as to the means, methods or procedure of performance by the Surety, the Oblige shall have the right, through itself or others, to do all or any part of the remaining work yet to be performed by the Principal and the Surety shall pay Oblige any losses or damages resulting therefrom.

The Surety hereby waives notice of any and all modifications, omissions, additions, changes and advance payments or deferred payments in or about the Agreement, and agrees that the obligations undertaken by this Bond shall not be impaired in any manner by reason of any such modifications, omissions, additions, changes, and advance payments or deferred payments.

3.

Any suit under this bond must be instituted before the expiration of two (2) years from the date on which final payment under the Agreement falls due.

By Agreement, this Bond shall not be subject to the limitation period of O.C.G.A. § 36-91-52.

Should any term or condition of this Bond be held or determined unenforceable, all other terms and conditions shall remain in full force and effect.

IN WITNESS WHEREOF, the Principal and Surety have hereunto affixed their corporate seals and caused this obligation to be signed by their duly authorized officers or attorneys-in-fact, this _____ day of _____, 2024.

[NAME OF PRINCIPAL]

BY: _____ [Seal]

Witness:

Date:

[NAME OF SURETY]

BY: _____ [Seal]

Witness:

Date:

Approved:

Date: _____ BY: _____

[ATTACHED SURETY'S POWER OF ATTORNEY]

SECTION 00130 – Bid Bond

EXHIBIT / TAB “J”

NAME OF PROJECT: **A NEW BUILDING FOR:
DALTON POLICE DEPARTMENT**

NAME OF OWNER: **CITY OF DALTON, GA**

**NAME OF PROPOSED
CONTRACTOR:**

(The “Contractor”)

KNOW ALL MEN BY THESE PRESENTS that

_____, as Surety (the “Surety”), and _____, as Principal (the “Contractor”) are held and firmly bound unto the THE CITY OF DALTON (the “City”), pursuant to the terms and conditions of this Bond (the “Bid Bond”) as set forth herein:

WHEREAS, the Contractor, in response to a Request for Proposals issued by the City, has submitted its Proposal for the construction by Contractor of: “A New Building for Dalton Police Department”, located at 301 Jones Street, Dalton GA 30720 (the “Project”).

NOW, THEREFORE, the condition of this obligation is such that if the City accepts the Proposal of the Contractor as submitted, or as revised or negotiated in accordance with the provisions of O.C.G.A. § 36-91-21(c)(2), and

- (a) The Contractor timely executes the Agreement between the City and Contractor (the “Agreement”) as provided by the City and as included in the Contract Documents; and,
- (b) The Contractor furnishes to the City fully executed Payment and Performance Bonds as required by the Agreement, then this obligation shall be void: otherwise, the Surety and the Contractor, shall be jointly and severally liable to the City, and shall make payment to the City, in the amount of five percent (5%) of the lump sum contract price (exclusive of any pricing for Alternates or unit prices) as set forth in the Proposal of the Contractor.

The Contractor agrees that the amount of this Bid Bond as set forth hereinabove constitutes a proper and lawful sum for liquidated damages which the City will sustain in the event Contractor fails or refuses to execute the Agreement or fails or refuses to furnish the required Payment and Performance Bonds.

The Surety shall cause to be attached to this Bid Bond a current and effective Power of Attorney evidencing the authority of the officer, agent, or representative who executed this Bond on behalf of the Surety to execute and deliver same.

This Bid Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bid Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bid Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bid Bond that is not in conflict therewith shall continue in full force and effect.

IN WITNESS WHEREOF, the undersigned have caused this Bid Bond to be executed and their respective corporate seals to be affixed and attested by their duly authorized representatives this ____ day of _____, 2024.

[CONTRACTOR]

By: _____ [SEAL]

Witness

Sworn and subscribed to before me this
____ day of _____, 2024.

NOTARY PUBLIC
Commission Expiration:

[NAME OF SURETY]

By: _____ [SEAL]

Witness

Sworn and subscribed to before me this
____ day of _____, 2024.

NOTARY PUBLIC
Commission Expiration:

[ATTACH PROPERLY EXECUTED POWER OF ATTORNEY]

SECTION 00140 - E-VERIFY

STATE OF GEORGIA

WHITFIELD COUNTY

EXHIBIT I

CITY OF DALTON

VENDOR AFFIDAVIT AND AGREEMENT (E-Verify)

COMES NOW before me, the undersigned officer duly authorized to administer oaths, the undersigned contractor, who, after being duly sworn, states as follows:

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. § 13-10-91 and Georgia Department of Labor Rule 300-10-1-.02, stating affirmatively that the individual, firm, or corporation which is contracting with the City of Dalton, Georgia has registered with and is participating in a federal work authorization program and will continue using the program throughout the contract period in accordance with the applicability provisions and deadlines established in O.C.G.A. § 13-10-91 and Georgia Department of Labor Rule 300-10-1-.02.

The undersigned contractor further agrees that, should it employ or contract with any subcontractor(s) in connection with the physical performance of services pursuant to the contract with the City of Dalton, Georgia of which this affidavit is a part, the undersigned contractor will secure from such subcontractor(s) similar verification of compliance with O.C.G.A. § 13-10-91 and Georgia Department of Labor Rule 300-10-1-.02 through the subcontractor's execution of the subcontractor affidavit required by Georgia Department of Labor Rule 300-10-1-.08 or a substantially similar subcontractor affidavit. The undersigned contractor further agrees to maintain records of such compliance and provide a copy of each such verification to the City of Dalton, Georgia at the time the subcontractor(s) is retained to perform such service.

FURTHER AFFIANT SAYETH NOT.

BY: Authorized Officer or Agent

Date

Authorization Date for EEV Program

Contractor Name

Employment Eligibility (EEV) #

Title of Authorized Officer or Agent of Contractor

Printed Name of Authorized Officer or Agent

Sworn to and subscribed before me

This ____ day of _____, 20____

Notary Public

My Commission Expires: _____

*MUST BE NOTARIZED

*Any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603. As of the effective date of O.C.G.A. § 13-10-91, the applicable federal work authorization program is the "EEV/Basic Pilot Program" operated by the U.S. Citizenship and Immigration Services Bureau of the U.S. Department of Homeland Security, in conjunction with the Social Security Administration.

SECTION 00150 – PRELIMINARY CONSTRUCTION SCHEDULE

- A. Description: A Construction Schedule for the project is provided herein. This schedule includes specific dates shown in Items 1 through 11. Dates for Items 1 through 5 may be considered preliminary until such time as Item No. 5 “Contract Award” is made.
1. If all dates for Items 1 through 5 are maintained, then the dates for Items 6 through 11 become the fixed Construction Schedule.
 2. If any dates of Items 1 through 5 slide forward, then all subsequent dates for Items 6 through 11 shall move forward by the same number of days that Item 5 misses its presently noted schedule.
 3. The schedule dates for the project shall be strictly adhered to and are the last acceptable dates unless they are modified by mutual consent of the Owner and the Contractor by written change order. All dates shall be indicated on contractor’s construction schedule. All dates indicate midnight unless otherwise stipulated.
- B. Schedule:
1. Advertisement of Request for Proposals.....03/01/2024
 2. Preproposal Meeting & Time 2:00 p.m.03/19/2024
 3. Proposal Due Date & Time 2:00 p.m.....04/02/2024
 4. Best & Final Offer (at Owner’s Option) Due Date & Time ..TBD
 5. Award of Contract.....04/15/2024
 6. Start of Contract Time04/15/2024
 7. Pre-Construction Conference.....04/23/2024
 8. Receipt of Insurance04/23/2024
 9. Notice to Proceed.....04/23/2024
 10. Substantial Completion.....05/01/2025
 11. Final Completion05/29/2025

End of Section

SECTION 01020 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements governing allowances.
 - 1. Selected materials and equipment are specified in the Contract Documents by allowances. In some cases, these allowances include installation. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when additional information is available for evaluation. If necessary, additional requirements will be issued by Change Order.
 - 2. All allowances included in Section 01020 and listed on the Proposal form shall be used only as directed by the Owner and Architect for additional work that is not already included in the contract documents. The Owner will assume full control of these funds throughout the project. At the conclusion of the project, the contract value will be reduced by the amount of any unused allowances.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Quantity allowances.
 - 3. Contingency allowances.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Modification Procedures" specifies procedures for submitting and handling Change Orders.
 - 2. Division 1 Section "Quality Control Services" specifies procedures governing the use of allowances for inspection and testing.

1.3 DEFINITIONS

- A. Suitable soil/materials are soils or materials defined as satisfactory or approved backfill and fill material or granular fill acceptable to the Engineer of Record.
- B. Unsuitable soil/material are soils or material defined as unsatisfactory and/or that are not suitable or appropriate for their intended use as determined by the testing agency or the Engineer of Record.

1.4 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise the Architect of the date when the final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At the Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

- C. Purchase products and systems selected by the Architect from the designated supplier.

1.5 SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Submit invoices or delivery slips to show the actual quantities of materials delivered to the site for use in fulfillment of each allowance.

1.6 ALLOWANCES, GENERAL

- A. Owner reserves the right to use unused portions of Allowances for other Work required by the Project.
 - 1. The Owner or Architect shall direct the Contractor as to the use of any unused Allowances.

1.7 QUANTITY ALLOWANCES

- A. Use quantity allowances as scheduled in this section in conjunction with unit prices as scheduled in Specification Section 01026 – Unit Prices to determine line item values associated with the quantity allowances schedule.
- B. Line items for each quantity allowance scheduled shall be included on the “Schedule of Values” included with application for payments.
- C. Contractors costs associated with these line item values shall include all cost necessary, including but not limited to materials, delivery, installation, insurance, applicable taxes, overhead and profit, labor burden, etc.
- D. Should the quantity allowances be exceeded, change orders authorizing additional quantities shall use the same unit price as scheduled in Specification 01026 – Unit Price for additional cost.
- E. At project closeout, credit all unused allowances remaining in the Schedule of Values to Owner by change order.

1.8 LUMP-SUM ALLOWANCES

- A. Line items for each lump sum allowance scheduled shall be included on the “Schedule of Values” included with the Application for Payment.
- B. Contractor’s costs associated with the utility allowances shall be based on the invoice amount from the utility company plus 7 ½ percent for Contractor’s handling. Contractor shall coordinate work with proper utility company, obtain written cost estimate from the utility company, and have estimate approved by Owner prior to beginning work.
- C. Should the lump sum allowances be exceeded, change orders authorizing additional costs shall be executed using the same basis of the original allowance (utility company invoice plus 7 ½ percent for Contractor’s handling).
- D. At project closeout, credit all unused allowances remaining the Schedule of values to Owner by Change Order.

1.9 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance and are part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.
- D. Line items for each contingency allowance scheduled shall be included on the "Schedule of Values" included with applications for payment.
- E. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

PART 2 - PRODUCTS

2.1 PRODUCTS

- A. Back fill and fill materials shall be provided as indicated in Division 2 – Earthwork or as recommended by testing company and approved by the Engineer of Record.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. If unsuitable soils or rock are encountered during the Project, the Project Testing Company and the Engineer of Record shall be notified immediately.

3.2 UNSUITABLE SOILS AND ROCK

- A. Removal, disposal and placement of unsuitable soils materials and any rock shall be at the recommendation of the Project's Testing Company and as approved by the Engineer of Record.
 - 1. Remove shall include removal by acceptable methods and equipment of the minimum quantities deemed necessary by the Project's Testing Company.
 - 2. Disposal shall include disposal of materials either on site or off site as indicated. Disposal of materials on site shall be at the direction of the Engineer of Record. Rock materials disposed of on site shall be placed in fill slopes as directed by the Engineer of Record. Disposal of materials off site shall be in accordance with applicable laws and regulations. It shall be the responsibility to dispose of off site materials accordingly.
 - 3. Place shall include obtaining suitable backfill and or fill materials or some obtained from on-site or off-site sources as indicated and placing materials and compacting to Project requirements. Materials obtained from on-site sources shall be obtained from on site locations as directed by the Engineer of Record.
 - 4. **No allowances shall be paid unless all quantities are qualified, quantified and approved by the Projects Testing Company and the Engineer of Record.**

3.3 REMOVAL AND RELOCATION OF EXISTING UTILITIES

- A. Removal or relocation of utilities shall be coordinated by the Contractor.

3.4 SCHEDULE OF ALLOWANCES:

Note: Allowances and Unit prices are in addition to work already included in the contract documents.

A line item for these allowances shall be included on the "Schedule of Values" included with application for payments.

At project closeout, credit the remaining amount of all allowances in the Schedule of Values to the Owner by change order.

A. Quantity Allowances

1. Include in the base bid an amount to remove and dispose of 25 cubic yards of Mass Rock off site.
2. Include in the base bid an amount to remove and dispose of 25 cubic yards of Mass Rock on site.
3. Include in the base bid an amount to remove and dispose of 25 cubic yards of Trench Rock off site.
4. Include in the base bid an amount to remove and dispose of 25 cubic yards of Trench Rock on site.
5. Include in the base bid an amount to remove and dispose of 200 cubic yards of unsuitable soil off site.
6. Include in the base bid an amount to remove and dispose of 100 cubic yards of unsuitable soil on site.
7. Include in the base bid an amount to haul in 200 cubic yards of suitable soil from off-site and compact in-place to replace excavated rock or unsuitable soil.
8. Include in the base bid an amount to haul in 100 cubic yards of suitable soil from on-site and compact in-place to replace excavated rock or unsuitable soil.
9. Include in the base bid an amount to haul in and place 100 cubic yards #4 stone
10. Include in the base bid an amount to haul in and place 100 cubic yards of #57 stone.
11. Include in the base bid an amount to haul in and place 100 cubic yards of Rip Rap.
12. Include in the base bid an amount to haul in and place 250 cubic yards of compacted graded aggregate base.
13. Include in the base bid an amount for material and placement of 500 square yards of Tensar BX 1100 Geogrid or approved equal.
14. Include in the base bid an amount to place and establish an additional 1/4 acre of sod. Preparation, topsoil and placement of sod shall be included and in compliance with the specifications.

15. Include in the Base Bid an amount to haul in and place 25 cubic yards of topsoil.
16. Include in the Base Bid an amount to furnish and place 100 lineal feet of Trench Drain TD1.
17. Include in the Base bid \$1,250 per 1000 bricks. All calculations for brick quantities are the responsibility of the contractor. See section 04200 Masonry for additional information.

B. Lump Sum Allowances

1. Include the lump sum amount of \$15,000 to furnish and install landscape materials in addition to those shown on the Drawings. This allowance shall be used at the Owner's discretion.
2. Include the lump sum amount of \$5,500 for the purchase of an adjustable lab table.
3. Include the lump sum amount of \$3,500 for the purchase of a ceiling mounted "medical exam style light". The installation shall be included in the contractor's base bid lump sum.

C. Contingency Allowance

1. General Construction Allowance: Include in the base bid an amount of \$150,000.00 for changes in the scope of work as authorized by the Owner and Architect.

SECTION 01030 - ALTERNATES

PART 1 - GENERAL

SUMMARY

This Section specifies administrative and procedural requirements for Alternates.

Definition: An alternate is an amount proposed by Bidders and stated on the Bid Form for certain construction activities defined in the Bidding Requirements that may be added to or deducted from Base Bid amount if the Owner decides to accept a corresponding change in the amount of construction to be completed, or in products, materials, equipment, systems or installation methods described in Contract Documents.

Coordination: Coordinate related Work and modify or adjust adjacent Work as necessary to ensure that Work affected by each accepted Alternate is complete and fully integrated into the project.

Notification: Immediately following the award of the Contract, prepare and distribute to each party involved, notification of the status of each Alternate. Indicate whether Alternates have been accepted, rejected or deferred for consideration at a later date. Include a complete description of negotiated modifications to Alternates.

Schedule: A "Schedule of Alternates" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials and methods necessary to achieve the Work described under each Alternate.

Include as part of each Alternate, miscellaneous devices, accessory objects and similar items incidental to or required for a complete installation whether or not mentioned as part of the Alternate.

SCHEDULE OF ALTERNATES:

Alternate No. 1

Provide an alternate price install split-face-block per Section 04200 in lieu of Manufactured Stone Masonry, Section 04732.

END OF SECTION 01030

SECTION 01250 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Sections include the following:
 - 1. Division 1 Payment Procedures

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Proposal Requests issued by Architect are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 7 days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or unforeseen conditions require modifications to the Contract, Contractor may propose changes by submitting a request for a change to Architect. Reference Section 00090 for additional instructions.

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

1.5 ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, base each Change Order proposal on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the Purchase Order amount or Contractor's handling, labor, installation, overhead, and profit.
 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

1.6 CHANGE ORDER PROCEDURES

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

END OF SECTION 01250

SECTION 01290 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Sections include the following:
 - 1. Division 1 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 2. Division 1 Section "Construction Progress Documentation" for administrative requirements governing preparation and submittal of Contractor's Construction Schedule and Submittals Schedule.
 - 3. Division 1 Section "Construction Photograph Documentation" for submittal of photographs with application of payment.

1.3 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.
 - 1. Correlate line items in the Schedule of Values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with Continuation Sheets.
 - b. Submittals Schedule.
 - c. Contractor's Construction Schedule.
 - 2. Submit the Schedule of Values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
 - a. The Schedule of Values must be approved by the Owner/Architect prior to submission of the initial application of payment.
 - 3. Sub-schedules: Where the Work is separated into phases requiring separately phased payments, provide sub-schedules showing values correlated with each phase of payment.
- B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section and additional line for major products as listed in the summary section. See example of pay application at the end of this section.

1. Identification: Include the following Project identification on the Schedule of Values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Dollar value.
 - 1) Percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
4. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Any items listed as stored items must be on-site. Include evidence of insurance and invoices.
 - b. **The owner will not pay for material stored off site unless stored in a bonded, insured warehouse. Proof of insurance shall be required prior to submitting application for payment. The contractor shall maintain full coverage for any damage or theft to stored materials.**
6. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
7. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
8. Each item in the Schedule of Values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place must be shown as separate line items in the Schedule of Values.

1.4 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: See Owner/Contractor Agreement.
- D. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment in addition the Georgia Dept. of Education coversheet.
1. The Contractor shall submit with each monthly payment application the Georgia Department of Education Facilities Services Unit Form 0263.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
1. Prior to contractor's first application for payment, the schedule of values must reflect the actual values of the subcontractor's contracts. Copies of these contracts will be made available to the architect and owner prior to submitting the first application for payment.
 2. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
 3. Include amounts of Change Orders and Field Directives issued before last day of construction period covered by application.
- F. Transmittal: Submit 1 (one) signed and notarized original copy of each Application for Payment to Architect by a method ensuring receipt within 24 hours. All copies shall include waivers of lien and similar attachments if required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
 2. Only one copy will be required as an original AIA Document.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
1. Submit partial waivers on each item for amount requested, before deduction for retainage, on each item.
 2. When an application shows completion of an item, submit final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 - a. Submit final Application for Payment with or proceeded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 4. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.
 - a. See example of a suggestive form at the end of this section.

- H. Onsite Stored Materials: All onsite stored material will need to be submitted as a separate spreadsheet as indicated at the end of this section with each applicable pay application. The Architect will review onsite stored material during the monthly pay application process and determine if material requested for payment is accurate. Again, Owner will not pay for offsite stored material.
- I. Submit Initial Application for Payment: Administrative actions and submittals that must precede and be approved by the Owner and Architect prior to the submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. List of major suppliers and fabricators
 3. Schedule of Values.
 4. Schedule of Unit Prices
 5. Contractor's Construction Schedule (preliminary if not final).
 6. Submittal Schedule.
 7. Schedule of preinstallation conferences.
 8. List of Contractor's staff assignments.
 9. List of Contractor's principal consultants.
 10. Copies of building permits.
 11. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 12. Initial progress report.
 13. Certificates of insurance and insurance policies.
 14. Performance and payment bonds.
 15. Initial settlement survey and damage report if required.
- J. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work, if applicable.
 3. Administrative actions and submittals that shall proceed or coincide with this application include:
 - a. Occupancy permits and similar approvals.
 - b. Warranties (guarantees) and maintenance agreements.
 - c. Test/adjust/balance records.
 - d. Maintenance instructions.
 - e. Meter readings.
 - f. Start-up performance reports.
 - g. Change-over information, including door lock change over, related to Owner's occupancy, use, operation and maintenance.
 - h. Final cleaning.
 - i. Application for reduction of retainage, and consent of surety.
 - j. Advice on shifting insurance coverage.
 - k. Final progress photographs.
 - l. List of incomplete work, recognized as exceptions to Architect's Certificate of Substantial Completion.
 4. After the Certificate of Substantial Completion has been executed by all parties concerned and before payment is made the Contractor shall submit the following documents:
 - a. Submit CONSENT OF SURETY TO FINAL REDUCTION IN OR PARTIAL RELEASE OF RETAINAGE, A.I.A. Document G707A, if not previously submitted.
- K. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Completion of any contract required training.
3. Completion of Project Closeout Documents.
4. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
5. Updated final statement, accounting for final changes to the Contract Sum.
6. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
7. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
8. AIA Document G707, "Consent of Surety to Final Payment."
9. Evidence that claims have been settled.
10. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
11. Final, liquidated damages settlement statement.
12. Removal of surplus materials, rubbish and similar elements from Owner's property.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01290 (See attached forms)

AFFIDAVIT AND WAIVER OF LIEN

_____ being first duly sworn says that he/she makes this affidavit on behalf of _____ having entered into an agreement with _____, the Owner for _____, on the premises of the Owner located at _____; that all labor material and services committed for have been fully paid and indebtedness discharged to the date of this affidavit. Furthermore, for and in considerations of \$ _____, the undersigned does hereby waive, release and relinquish all claims for right of lien which the undersigned may now have upon the premises above described, for labor and material, general supervision of construction or alteration, and/or otherwise except for claims or right of lien for contract and/or change order work performed to extent that payment is being retained or will subsequently become due.

Name of Firm

Name

Title of Officer

Subscribed and Sworn to before me,

This _____ day of _____

Notary

A	B	C	D	E	F	G		H	I
Item No.	Description of Work	Schedule d of Value	Work Completed		Materials Presently Stored (Not in D or E)	Total Completed & Stored To Date (D + E + F)	% (C / G)	Balance To Finish (C - G)	Retainage (If Variable Rate)
			From Previous application (D + E)	This Period					
Division 1.00 - General Requirements									
1.01	Supervision								
1.02	OH&P								
1.03	Temporary Utilities								
1.04	Insurance								
1.05	Payment & Performance Bond								
1.06	Engineering/Surveying								
1.07	Safety								
1.08	Office Rental								
1.09	Equipment & Tool (Small) Retail								
1.10	Projection Documentation								
1.11	Daily Clean-up								
1.12	Dump Fee								
1.13	Final Clean								
1.14	Closeouts/As-builts								
1.15	Etc.								
	TOTALS								
Division 2.00 - Sitework									
2.01	Bond								
2.02	Mobilization								
2.03	Submittals/Shop Drawings								

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2.04	Erosion Control BMP's								
2.05	Temporary Ponds								
2.06	Temporary Grassing								
2.07	Slope Matting								
2.08	Clear & Grub								
2.09	Earthwork								
2.10	Construction Entrances								
2.11	Layout & Staking								
2.12	Mass Grading								
2.13	Fine Grade Building Pad								
2.14	Fine Grade Parking Lot								
2.15	SD2's								
2.16	SD3's								
2.17	Retaining Wall								
2.18	Storm Drain Material								
2.19	Storm Drain Install								
2.20	Sanitary Sewer Material								
2.21	Sanitary Sewer Install								
2.22	Site Fire Line Material								
2.23	Site Fire Line Install								
2.24	Domestic Water Material								
2.25	Domestic Water Install								
2.26	Fire Hydrants								
2.27	Heavy Duty Asphalt Paving								
2.28	Light Duty Asphalt Paving								
2.29	Curb & Gutter								
2.30	Striping & Signage								
2.31	Basketball Court Paving								

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2.35	Chain Link Fencing								
2.36	Bollards								
2.37	Landscaping								
2.38	Termite Treatment								
2.39	Etc.								
2.40									
	TOTALS								
Division 3.00 - Concrete									
3.01	Bond								
3.02	Mobilization								
3.03	Submittals/Shop Drawings								
3.04	Concrete Footing (Area A-F)								
3.04a	Concrete Footing - Area A								
3.04b	Concrete Footing - Area B								
3.04c	Etc.								
3.05	Concrete SOG (Area A-K)								
3.06	Concrete Sidewalk								
3.07	Concrete Paving								
3.08	Etc.								
3.09									
	TOTALS								
Division 4.00 - Masonry									
4.01	Bond								
4.02	Mobilization								
4.03	Submittals/Shop Drawings								
4.04	CMU Material (Area A-K)								
4.05	CMU Labor (Area A-K)								
4.06	Splitface Material (Area A-K)								

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4.07	Splitface Labor (Area A-K)								
4.08	CMU & Splitface Accessories								
4.09	Brick Accessories								
4.10	Clean Brick								
4.11	Etc.								
4.12									
	TOTALS								
Division 5.00 - Metals									
5.01	Bond								
5.02	Mobilization								
5.03	Submittals/Shop Drawings								
5.04	Anchor Bolts								
5.05	Embeds								
5.06	Columns & Beams - Material (Area A-K)								
5.07	Columns & Beams - Labor (Area A-K)								
5.08	Joist - Material (Area A-K)								
5.09	Joist - Labor (Area A-K)								
5.10	Steel Decking - Material (Area A-K)								
5.11	Steel Decking - Labor (Area A-K)								
5.12	Trusses - Material (Area A-K)								
5.13	Trusses - Labor (Area A-K)								
5.14	Misc. Metals								
5.15	Stairs & Rails - Material								
5.16	Stairs & Rails - Labor								
5.17	Etc.								
5.18									
	TOTALS								
Division 6.00 - Woods & Plastics									

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PAYMENT PROCEDURES

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6.01	Bond								
6.02	Submittals/Shop Drawings								
6.03	Rough Carpentry								
6.04	Etc.								
6.05									
	TOTALS								
Division 7.00 - Thermal & Moisture Protection									
7.01	Bond								
7.02	Mobilization								
7.03	Submittals/Shop Drawings								
7.04	Waterproofing								
7.05	Damproofing								
7.06	Firestopping								
7.07	Vapor Barrier & Retarder								
7.08	Roof Insulation - Material								
7.09	Roof Insulation - Labor								
7.08	Standing Seam Metal Panels - Material								
7.09	Standing Seam Metal Panels - Labor								
7.10	Wall Panels - Material								
7.11	Wall Panels - Labor								
7.12	Built-up Roof - Material								
7.13	Built-up Roof - Labor								
7.14	Roof Hatch								
7.15	Joint Sealants								
7.16	Etc.								
7.17									
	TOTALS								
Division 8.00 - Doors & Windows									

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8.01	Bond								
8.02	Mobilization								
8.03	Submittals/Shop Drawings								
8.04	HM Doors & Frames (Area A-K)								
8.05	FRP Doors (Area A-K)								
8.06	Traffic Doors (Area A-K)								
8.07	Wood Doors (Area A-K)								
8.08	Finish Hardware (Area A-K)								
8.09	Glass & Glazing (Area A-K)								
8.10	Alum. Entrances & Storefronts								
8.11	Coiling Doors								
8.12	Etc.								
8.13									
	TOTALS								
Division 9.00 - Finishes									
9.01	Bond								
9.02	Mobilization								
9.03	Submittals/Shop Drawings								
9.04	Metal Studs - Exterior (Material)								
9.05	Metal Studs - Interior (Labor)								
9.06	Sheathing - Exterior (Material)								
9.07	Sheathing - Interior (Labor)								
9.08	Insulation - Exterior (Material)								
9.09	Insulation - Interior (Labor)								
9.10	Gypsum Board Walls (Material)								
9.11	Gypsum Board Walls (Labor)								
9.12	Gypsum Board Ceiling (Material)								
9.13	Gypsum Board Ceiling (Labor)								

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9.10	Gypsum Board Finish Walls (Material)								
9.11	Gypsum Board Finish Ceiling								
9.12	Quarry Tile (Material)								
9.13	Quarry Tile (Labor)								
9.14	Acoustical Grid (Material)								
9.15	Acoustical Grid (Labor)								
9.16	Acoustical Tile (Material)								
9.17	Acoustical Tile (Labor)								
9.18	Wood Flooring								
9.19	VCT (Material)								
9.20	VCT (Labor)								
9.21	Resilient Flooring								
9.22	Stair Treads & Rubber Tile								
9.23	Resinous Flooring								
9.24	Polished Concrete Floors								
9.25	Painting								
9.26	Etc.								
9.27									
	TOTALS								
Division 10.00 - Specialties									
10.01	Bond								
10.02	Submittals/Shop Drawings								
10.03	Visual Display Board								
10.04	Toilet Partition & Accessories								
10.05	Metal Lockers								
10.06	Louvers & Vents								
10.07	Flagpole								
10.08	Signage (Exterior)								

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10.09	Signage (Interior)								
10.10	Fire Protection Specialties								
10.11	Prefab Metal Canopy								
10.12	Storage Shelving								
10.13	Toilet & Bath Accessories								
10.10	Etc.								
10.11									
	TOTALS								
Division 11.00 - Equipment									
11.01	Bond								
11.02	Submittals/Shop Drawings								
11.03	Stage Curtain								
11.04	Projector Screen								
11.05	Food Service Equipment (Material)								
11.06	Food Service Equipment (Labor)								
11.07	Walk-in Cooler & Freezer (Material)								
11.08	Walk-in Cooler & Freezer (Labor)								
11.09	Gymnasium Equipment								
11.10	Scoreboards								
11.11	Dock Bumpers								
11.12	Key Vault (Knox Box)								
11.13	Etc.								
11.14									
	TOTALS								
Division 12.00 - Furnishings									
12.01	Bond								
12.02	Submittals/Shop Drawings								
12.03	General Casework								

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12.04	Library Casework								
12.05	Laboratory Casework								
12.06	Window Treatment								
12.07	Telescoping Stands								
12.08	Floor Mats								
12.09	Etc.								
12.10									
	TOTALS								
Division 13.00 - Special Construction									
13.01	Bond								
13.02	Mobilization								
13.03	Submittals/Shop Drawings								
13.04	Fire Suppression Piping (Divide in Zones) - Material								
13.05	Fire Suppression Piping (Divide in Zones) - Labor								
13.06	Etc.								
13.07									
	TOTALS								
Division 14.00 - Conveying Systems									
14.01	Bond								
14.02	Mobilization								
14.03	Submittals/Shop Drawings								
14.04	Elevator								
14.05	Etc.								
14.06									
Division 15.00 - Mechanical									
15.01	Plumbing - Bond								
15.02	Plumbing - Mobilization								

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15.03	Plumbing - Submittals/Shop Drawings								
15.04	Plumbing - Closeouts								
15.05	Plumbing - Testing & Video								
15.06	Plumbing - Underground Rough-in (Material)								
15.07	Plumbing - Underground Rough-in (Labor)								
15.08	Plumbing - Floor Drains / Cleanouts (Material)								
15.09	Plumbing - Floor Drains / Cleanouts (Labor)								
15.10	Plumbing - Roof Drains / Cleanouts (Material)								
15.11	Plumbing - Roof Drains / Cleanouts (Labor)								
15.12	Plumbing - Downspout Boot (Material)								
15.13	Plumbing - Downspout Boot (Labor)								
15.14	Plumbing - Grease Trap (Material)								
15.15	Plumbing - Grease Trap (Labor)								
15.16	Plumbing - Copper Pipe (Material)								
15.17	Plumbing - Copper Pipe (Labor)								
15.18	Plumbing - Overhead Cast Iron Pipe (Material)								
15.19	Plumbing - Overhead Cast Iron Pipe (Labor)								
15.20	Plumbing - Gas Piping (Material)								
15.21	Plumbing - Gas Piping (Labor)								
15.22	Plumbing - Fixtures (Material)								
15.23	Plumbing - Fixtures (Labor)								
15.24	Etc.								
15.25	HVAC - Bond								
15.26	HVAC - Mobilization								
15.27	HVAC - Submittals/Shop Drawings								

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15.28	HVAC - Coordinating Drawings								
15.29	HVAC - Closeouts								
15.30	HVAC - Roof Top Curb (Material)								
15.31	HVAC - Roof Top Curb (Labor)								
15.32	HVAC - Roof Top Unit (Material)								
15.33	HVAC - Roof Top Units (Labor)								
15.34	HVAC - Chiller (Material)								
15.35	HVAC - Chiller (Labor)								
15.36	HVAC - Ionization Unit (Material)								
15.37	HVAC - Ionization Unit (Labor)								
15.38	HVAC - Fan Coil Unit (Material)								
15.39	HVAC - Fan Coil Unit (Labor)								
15.40	HVAC - Gas Unit Heater (Material)								
15.41	HVAC - Gas Unit Heater (Labor)								
15.42	HVAC - Ductless Split Unit (Material)								
15.43	HVAC - Ductless Split Unit (Labor)								
15.44	HVAC - Boiler Permit								
15.45	HVAC - Hot Water Boiler (Material)								
15.46	HVAC - Hot Water Boiler (Labor)								
15.47	HVAC - ERU's (Material)								
15.48	HVAC - ERU's (Labor)								
15.49	HVAC - Condensing Units (Material)								
15.50	HVAC - Condensing Units (Labor)								
15.51	HVAC - Exhaust Fans (Material)								
15.52	HVAC - Exhaust Fans (Labor)								
15.53	HVAC - Range Hood System (Material)								
15.54	HVAC - Range Hood System (Labor)								
15.55	HVAC - Range Hood Fire System								

15.56	HVAC - Grills & Registers (Material)								
15.57	HVAC - Grills & Registers (Labor)								
15.58	HVAC - Ductwork (Material)								
15.59	HVAC - Ductwork (Labor)								
15.60	HVAC - Duct Accessories (etc.)								
15.61	HVAC - Fire/Smoke Dampers (Material)								
15.62	HVAC - Fire/Smoke Dampers (Labor)								
15.63	HVAC - Louvers								
15.64	HVAC - Kiln Hood								
15.65	HVAC - Air Curtain								
15.66	HVAC - Residential range Hood								
15.67	HVAC - Piping/Accessories (Material)								
15.68	HVAC - Piping/Accessories (Labor)								
15.69	HVAC - Piping Identification								
15.70	HVAC - Flow Control Valves								
15.71	HVAC - Vibration Isolation								
15.72	HVAC - Chemical Treatment								
15.73	HVAC - Equipment & Pipe Support (Material)								
15.74	HVAC - Equipment & Pipe Support (Labor)								
15.75	HVAC - Boiler Flues								
15.76	HVAC - VFD's								
15.77	Etc.								
15.78	EMS/Controls - Bond								
15.79	EMS/Controls - Mobilization/Pre-Engineering								
15.80	EMS/Controls - Submittals/Shop Drawings								
15.81	EMS/Controls - Closeouts								
15.82	EMS/Controls - Engineering								

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15.83	EMS/Controls - Modules and Sensors								
15.84	EMS/Controls - Valves and Dampers								
15.85	EMS/Controls - Installation								
15.86	EMS/Controls - Commissioning								
15.87	EMS/Controls - Misc. Filters								
15.88	EMS/Controls - Test and Start								
15.89	Etc.								
	TOTALS								
Division 16.00 - Electrical									
16.01	Bond								
16.02	Mobilization								
16.03	Submittals/Shop Drawings								
16.04	Closeouts								
16.05	Underground Conduit (Material)								
16.06	Underground Conduit (Labor)								
16.07	Underground Wire (Material)								
16.08	Underground Wire (Labor)								
16.09	Conduit / Boxes Rough-in (Wall)								
16.10	Conduit / Boxes Rough-in (Ceiling)								
16.11	Cable Tray (Material)								
16.12	Cable Tray (Labor)								
16.13	Building Wire (Material)								
16.14	Building Wire (Labor)								
16.15	Wiring Devices (Material)								
16.16	Wiring Devices (Labor)								
16.17	Switchboard & Panels (Material)								
16.18	Switchboard & Panels (Labor)								
16.19	Lighting Fixtures (Material) - Area A-K								

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16.20	Lighting Fixtures (Labor) - Area A-K								
16.21	Fire Alarm (Material) - Area A-K								
16.22	Fire Alarm (Labor) - Area A-K								
16.23	Fire Alarm (Test & Certify)								
16.24	Intercom (Material) - Area A-K								
16.25	Intercom (Labor) - Area A-K								
16.26	Cafeteria Sound System (Labor) - Area A-K								
16.27	Cafeteria Sound System (Material) - Area A-K								
16.28	Gymnasium Sound System (Labor) - Area A-K								
16.29	Gymnasium Sound System (Material) - Area A-K								
16.30	Telephone & Computer - Area A-K								
16.31	Generator (Material)								
16.32	Generator (Labor)								
16.33	Etc.								
	TOTALS								
Allowance									
17.01	See Specification								

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STORED ONSITE MATERIAL EXAMPLE SUMMARY

Application No.:

Period From:

Period to:

A	B	C	D	E	F	G
Item No.	Description of Work	Trade (GC or Sub)	Type of Material	Location Stored	Quantity	Cost
5.15	Stairs & Rails - Material	JM Steel	Stair Pans	Stairwell B-2	4	\$7,500
7.08	Roof Insulation - Material	Roof Plus	3" Roof Insulation	Site (Area B)	100% (Area C-D)	\$38,000
8.07	Wood Doors (Area A)	Door Supply Co.	Doors	Science Lab C-25	35	\$25,000
8.08	Finish Hardware (Area A)	Door Supply Co.	Hardware	Job Trailer	50% (Area A)	\$5,400
9.18	Wood Flooring	Smiths Flooring	Gym Floor	Gymnasium	100	\$30,000
15.22	Plumbing - Fixtures (Material)	PJs Plumbing & Son	Sinks	Plumber Trailer	20	\$4,500
15.58	HVAC - Ductwork (Material)	HVAC Industrial	Duct	Classroom B-12	30% (Area F)	\$5,500
Total						\$115,900

SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General project coordination procedures.
 - 2. Coordination Drawings.
 - 3. Administrative and supervisory personnel.
 - 4. Project meetings.
 - 5. RFI's (Request for Information).
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 1 Section "Construction Progress Documentation" for preparing and submitting the Contractor's Construction Schedule.
 - 2. Division 1 Section "Execution Requirements" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Division 1 Section "Closeout Procedures" for coordinating Contract closeout.

1.3 DEFINITION

- A. RFI – Is a request made by the Contractor for further information or clarification during construction.

1.4 COORDINATION

- A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.

4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
 - B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
 - C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 1. Preparation of Contractor's Construction Schedule.
 2. Preparation of the Schedule of Values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.
 5. Progress meetings.
 6. Preinstallation conferences.
 7. Start up and adjustment of systems.
 8. Project closeout activities.
 9. Warranty work.
 - D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work.
 - E. Equipment other than that on which the Drawings are based:
 1. The structural, mechanical and electrical requirements for certain items of equipment are based on a particular manufacturer. However, other manufacturers may have also been approved for use. It shall be the Contractor's responsibility to provide for any changes in structural, mechanical, and electrical requirements for equipment other than that on which the Drawings and Specifications are based at no cost to the Owner. The Contractor shall give special attention to coordinating the location of the required electrical connections of equipment and coordinating the ampacity, voltage, and phase characteristics of the equipment furnished with the design ampacity, voltage, and phase of the specific electrical circuit indicated on the shop drawings for this equipment.
 - F. Coordinate with Authority Having Jurisdiction (AHJ).
 1. Contractor shall contact and coordinate with all AHJ's, local and others, for required inspections, fees, etc. These include, but are not limited to, the building Dept, the Fire Marshal's Office, Water and Sewer Authority and the County Engineering Department.
 - G. Coordinate with Owner's testing agency.
 1. Contractor shall coordinate all special inspection testing with the Owner's agent.
- 1.5 SUBMITTALS
- A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:
 - a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - b. Indicate required installation sequences.
 - c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
2. Indicate relationship of components shown on separate Shop Drawings.
3. Indicate required installation sequences.
4. Coordination Drawings Prints: Prepare coordination drawings prints in accordance with requirements of Division 1 Section "Submittal Procedures."
5. Refer to Division 15 Section "Basic Mechanical Materials and Methods" and Division 16 Section "Basic Electrical Materials and Methods" for specific Coordination Drawing requirements for mechanical and electrical installations.
6. Review: Architect will review coordination drawings to confirm that the work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility. If the Architect determines that the coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, the Architect will so inform the Contractor, who shall make changes as directed and resubmit.

1.6 KEY PERSONNEL

- A. Staff Names: Within 15 (fifteen) days of starting construction operations, submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, cellular and office telephone numbers. Provide names, email addresses, business addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
- B. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone.
- C. Update list if changes or additions occur and redistribute.

1.7 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

- A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.
 1. Include special personnel required for coordination of operations with other contractors.

1.8 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
 1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.

3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within 3 (three) days of the meeting.
- B. Preconstruction Conference: See preliminary schedule. Hold the conference at the Office of the Owner. Conduct the meeting to review responsibilities and personnel assignments. The Notice to Proceed will not be issued prior to the pre-construction conference.
1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long lead items.
 - d. Designation of responsible personnel.
 - e. Procedures for processing field decisions and Change Orders.
 - f. RFI procedures.
 - g. Procedures for processing Applications for Payment.
 - h. Distribution of the Contract Documents.
 - i. Procedures for testing and inspections.
 - j. Submittal procedures.
 - k. Review Procurement Schedule.
 - l. Preparation of Record Documents.
 - m. Use of the premises.
 - n. Responsibility for temporary facilities and controls.
 - o. Parking availability.
 - p. Office, work, and storage areas.
 - q. Equipment deliveries and priorities.
 - r. Safety/First aid.
 - s. Security.
 - t. Progress cleaning.
 - u. Working hours.
 3. Minutes: Contractor shall record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
 2. Preinstallation Conference Schedule:
 - a. Masonry/electrical/plumbing rough-in.
 - b. Mechanical/electrical/plumbing/fire protection coordination.
 - c. Roofing.
- D. Progress Meetings (OAC's): Conduct progress meetings every two weeks. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner and Architect, the contractor, and requested subcontractors shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals (log).
 - 4) Procurement Schedule.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site utilization.
 - 9) Temporary facilities and controls.
 - 10) Work hours.
 - 11) Hazards and risks.
 - 12) Progress cleaning.
 - 13) Quality and work standards.
 - 14) Change Orders status.
 - 15) Pending claims and disputes.
 - 16) RFI status.
 - 17) Review Monthly Pay Application with all related backup information.
 - 18) 30 day look ahead and behind.
 - 19) As-built review.
 - 20) Closeout Document Status.
 - 21) Review Owner furnished items.
3. Reporting: Contractor shall record and distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
 - a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with each months pay request.

E. Fire Marshal Inspections: Schedule with Fire Marshal for inspections at 50%, 80%, 100% complete and as required by the AHJ.

1.7 REQUESTS FOR INFORMATION (RFIs)

- A. Procedure: Immediately on discovery of the need for information or interpretation of the Contract Documents, and if not possible to request information at Project meeting, prepare and submit an RFI in the form specified.

1. RFIs shall originate with Contractor. RFIs submitted by entities other than Contractor will be returned with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. Date.
 3. Name of Contractor.
 4. Name of Architect.
 5. RFI number, number sequentially.
 6. Specification Section number and title and related paragraphs, as appropriate.
 7. Drawing number and detail references, as appropriate.
 8. Field dimensions and conditions, as appropriate.
 9. Contractor's suggested solution(s). If Contractor's solution(s) impact the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 10. Contractor's signature.
 11. Attachments: Include drawings, descriptions, measurements, photos, Product Data, Shop Drawings, and other information necessary to fully describe items needing interpretation.
 - a. Supplementary drawings prepared by Contractor shall include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments.
- C. Architect's Action: Architect will review each RFI, determine action required, and return it. RFIs received after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
 - a. Request for approval of submittals
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.
 - f. Incomplete RFIs or RFIs with numerous errors.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will start again.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 1 Section "Contract Modification Procedures".
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- D. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly. Include the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect.

4. RFI number including RFIs that were dropped and not submitted.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

END OF SECTION 01310

SECTION 01320 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

- 1. Preliminary Construction Schedule.
- 2. Contractor's Construction Schedule.
- 3. Submittals Schedule.
- 4. Material location reports.
- 5. Field condition reports.
- 6. Construction photographs.
- 7. RFI Log.

- B. Related Sections include the following:

- 1. Division 1 Section "Summary of Multiple Contracts" for preparing a combined Contractor's Construction Schedule.
- 2. Division 1 Section "Payment Procedures" for submitting the Schedule of Values.
- 3. Division 1 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes.
- 4. Division 1 Section "Submittal Procedures" for submitting schedules and reports.
- 5. Division 1 Section "Quality Requirements" for submitting a schedule of tests and inspections.
- 6. Division 1 Section "Closeout Procedures" for submitting photographic negatives as Project Record Documents at Project closeout.

- C. Preliminary Construction Schedule: Submit 2 (two) printed copies; one a single sheet of reproducible media, and one a print.

- D. Contractor's Construction Schedule: Submit 2 (two) printed copies of initial schedule, one a reproducible print and one a blue- or black-line print, large enough to show entire schedule for entire construction period.

1.3 COORDINATION

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

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

- 1. Secure time commitments for performing critical elements of the Work from parties involved.

2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

- A. Submittals Schedule: Comply with requirements in Division 1 Section "Submittal Procedures" for list of submittals and time requirements for scheduled performance of related construction activities.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Procedures: Comply with procedures contained in AGC's "Construction Planning & Scheduling."
- B. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- C. Activities: Treat each story or separate area as a separate numbered activity for each principal element of the Work. Comply with the following:
 1. Activity Duration: Define activities so no activity is longer than 45 (forty-five) days, unless specifically allowed by Architect.
 2. Submittal Review Time: Include review and resubmittal times indicated in Division 1 Section "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with Submittals Schedule.
 3. Startup & Testing Time: Include days for startup and testing.
 4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for Architect's administrative procedures necessary for certification of substantial Completion.
 5. Punch List and Final Completion: Include not more than 30 days for punch list and final completion (include closeout documents).
- D. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion.

2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Construction Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's Construction Schedule within 10 (ten) days of date established for the Notice to Proceed. Base schedule on the Preliminary Construction Schedule and whatever updating and feedback was received since the start of Project. Dates shown in Section 00150 shall be reflected in schedule. Do not show early completion.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. The Schedule shall include only one critical path.
 1. For construction activities that require 3 months or longer to complete, indicate an estimated completion percentage in 10 (ten) percent increments within time bar.

2.4 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site”:
1. List of subcontractors at Project site.
 2. List of separate contractors at Project site.
 3. Approximate count of personnel at Project site.
 4. Equipment at Project site.
 5. Material deliveries.
 6. High and low temperatures and general weather conditions.
 7. Accidents.
 8. Meetings and significant decisions.
 9. Unusual events (refer to special reports).
 10. Stoppages, delays, shortages, and losses.
 11. Meter readings and similar recordings.
 12. Emergency procedures.
 13. Orders and requests of authorities having jurisdiction.
 14. Change Orders received and implemented.
 15. Construction Change Directives received and implemented.
 16. Services connected and disconnected.
 17. Equipment or system tests and startups.
 18. Partial Completions and occupancies.
 19. Substantial Completions authorized.
- B. Material Location Reports: At monthly intervals, prepare a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated away from Project site.
- C. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare a detailed report. Submit with a request for information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.4 SPECIAL REPORTS

- A. General: Submit special reports directly to the Owner/Architect within one day(s) of an occurrence. Submit copies of the report to all affected by the occurrence.
- B. Reporting Unusual Events: Prepare and submit a report if an unusual event whether related or not to the project to the Owner/Architect. List all parties involved, event that took place, response by Contractors personnel, results of the events, and any similar pertinent information.
- C. Quality Control reporting: Prepare, track and report all quality control issues as they arise. Include the date of occurrence and anticipated date for correction.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate Actual Completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01320

SECTION 01322 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Periodic construction photographs.
 - 3. Final Completion construction photographs.
- B. Related Sections include the following:
 - 1. Division 1 Section "Submittal Procedures" for submitting photographic documentation.
 - 2. Division 1 Section "Payment Procedures" for monthly photographic documentation.

1.3 SUBMITTALS

- A. Construction Photographs: Submit photographs on monthly intervals with the application for payment.
 - 1. Digital Images: Submit two copies of each complete set of digital image electronic files on a removable thumb drive. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as the sensor, uncropped.

1.4 USAGE RIGHTS

- A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in uncompressed JPEG format, produced by a digital camera with minimum sensor size of 12.0 megapixels, and at an image resolution of not less than 1600 by 1200 pixels and 400 dpi.

PART 3 - EXECUTION

3.1 CONSTRUCTION PHOTOGRAPHS

- A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
 - 1. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 - 2. Date and Time: Include date and time in filename for each image.
- B. Preconstruction Photographs: Before starting construction, take digital photographs of Project site, areas to receive renovation and surrounding properties, including existing items to remain during construction, from different vantage points.
 - 1. Take photographs to show existing conditions of all areas to be renovated or replaced..
 - 2. Take photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
 - 3. Take additional photographs as required to record existing conditions prior to any work.
- C. Periodic Construction Photographs: Take digital photographs daily, weekly, monthly or as otherwise necessary to show new work and progress of work. Coordinate with cutoff date associated with each application for payment. Provide a minimum of 60 photographs. Select vantage points to show status of construction and progress since last photographs were taken.
 - 1. Identification: Provide the following information with each digital image description in file metadata tag:
 - a. Project Name
 - b. Project Number
 - c. Photograph Number (order)
 - d. Date Taken
 - e. Location of Photograph
 - 2. Progress Photographs: Submit progress photos with monthly pay application. Photos to be submitted in a digital format.
- D. Final Completion Construction Photographs: Take 10 digital photographs after date of Substantial Completion for submission as Project Record Documents. Architect will direct photographer for desired vantage points.
- E. Additional Photographs: Architect may issue requests for additional photographs, in addition to periodic photographs specified.
 - 1. Three days' notice will be given, where feasible.
 - 2. In emergency situations, take additional photographs within 24 hours of request.
 - 3. Circumstances that could require additional photographs include, but are not limited to, the following:
 - a. Special events planned at Project site.
 - b. Immediate follow-up when on-site events result in construction damage or losses.
 - c. Photographs to be taken at fabrication locations away from Project site.
 - d. Substantial Completion of a major phase or component of the Work.
 - e. Extra record photographs at time of final acceptance.
 - f. Owner's request for special publicity photographs.

END OF SECTION 01322

SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.
- B. Related Sections include the following:
 - 1. Division 1 Section "Payment Procedures" for submitting Applications for Payment and the Schedule of Values.
 - 2. Division 1 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
 - 3. Division 1 Section "Closeout Procedures" for submitting closeout documents.
 - 4. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 5. Division 2 – 16 Sections for requirements for submittals of operation of maintenance data, demonstration and training and special cleaning requirements for products of those sections.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information that requires Architect's responsive action.
- B. Informational Submittals: Written information that does not require Architect's approval. Submittals may be rejected for not complying with requirements.

1.4 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD Drawings of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
- B. Electronic Submittals: All shop drawings and product data shall be submitted in electronic format to the project email address provided by the Architect. Material samples and mockups shall be shipped to the architect's office via USPS, UPS or FedEx.
- C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Retain subparagraph and associated subparagraph below if one submittal has an impact on another submittal.

3. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
 - b. No color selections will be made until all submittals requiring color selection have been approved.
- D. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmitting, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making correction or modifications to submittals noted by the Architects office and additional time for handling and reviewing submittals required by those corrections.
 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
 2. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule prior to submittal of first application for payment.
- E. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 1. Initial Review: Allow sufficient time for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow sufficient time for review of each resubmittal.
- F. Identification: Place a permanent label or title block on each submittal for identification.
 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Review thoroughly and Include the following information on label for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect
 - d. Name and address of Contractor.
 - e. Name and address of subcontractor.
 - f. Name and address of supplier.
 - g. Name of manufacturer.
 - h. Number and title of appropriate Specification Section. Clearly indicate appropriate division number from 16 division format.
 - 1) Example – 08110 Steel Doors Section 2.3.
 - i. Drawing number and details, if necessary.
 - j. Location of product is to be installed, if necessary.
 - k. Remarks.
 - l. Other necessary identification.
- G. Options: Identify options requiring selection by the Architect.

- H. Deviations: Highlight, encircle, or otherwise identify deviations from the Contract Documents on submittals. Architects review / approval does not relieve the Contractor from any requirements of the contract documents.
 - I. Additional Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
 - J. Transmittal: Package each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form.
- 1. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents and any comments stating noncompliance. Submittals will be returned to the contractor without action if the contractor fails to review the submittal and include his certification.
 - 2. Transmittal Form: Provide locations on form for the following information:
 - a. Project name.
 - b. Date.
 - c. Destination (To:).
 - d. Source (From:).
 - e. Names of subcontractor, manufacturer, and supplier.
 - f. Category and type of submittal.
 - g. Submittal purpose and description.
 - h. Specification Section number and title.
 - i. Drawing number and detail references, if necessary.
 - j. Submittal and transmittal distribution record.
 - k. Transmittal number.
 - l. Remarks.
 - m. Signature of transmitter.
 - 3. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same label information as related submittal.
- L. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
 - 1. Note date and content of previous submittal.
 - 2. Note date and content of revisions in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked "approved" or "approved as noted".
- M. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- N. Use for Construction: Use only final submittals with mark indicating action taken by Architect in connection with construction.
- O. Color Selection: No color selections will be made until all submittal requiring colors are submitted and approved.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. General: Prepare and submit Action Submittals required by individual Specification Sections.
1. Electronic Submittals: Submit electronic submittals to Architects office via email. All reviewed submittals will be returned via email. Verify size of document before emailing to Architects office. Anything over 10 MB will need to approved by Architect before submitting.
 2. Hard Copies Submittals: The architect's office may request hard copies of shop drawings and product data. No more than two copies will be requested per submittal.
 - a. Distribution of hard copies – If hard copies are requested, the Architect will retain both copies. Comments will be returned to the contractor by email.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's written recommendations.
 - b. Manufacturer's product specifications.
 - c. Manufacturer's installation instructions.
 - d. Standard color charts. Note any up-charge for premium or custom colors.
 - e. Manufacturer's catalog cuts.
 - f. Wiring diagrams showing factory-installed wiring.
 - g. Printed performance curves.
 - h. Operational range diagrams.
 - i. Standard product operating and maintenance manuals.
 - j. Compliance with recognized trade association standards.
 - k. Compliance with recognized testing agency standards.
 - l. Application of testing agency labels and seals.
 - m. Notation of coordination requirements.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate compliance with the contract documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shopwork manufacturing instructions.
 - g. Templates and patterns.
 - h. Design calculations.
 - i. Compliance with specified standards.
 - j. Notation of coordination requirements.
 - k. Notation of dimensions established by field measurement.
 - l. Relationship to adjoining construction clearly indicated.
 - m. Seal and signature of professional engineer if required.
- D. Coordination Drawings: Comply with requirements in Division 1 Section "Project Management and Coordination."

- E. Samples: Prepare physical units of materials or products, including the following:
1. Comply with requirements in other sections for mockups.
 2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 4. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Prepare Samples to match Architect's sample where so indicated. Attach label on unexposed side that includes the following:
 5. Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, provide the following:
 - a. Size limitations.
 - b. Compliance with recognized standards.
 - c. Availability.
 - d. Delivery time.
 6. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.
 - a. If variation in color, pattern, texture, or other characteristic is inherent in the product represented by a Sample, submit at least 3 (three) sets of paired units that show approximate limits of the variations.
 7. Number of Samples for Selection: Submit at a minimum of 3 (three) full set[s] of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return 1 (one) submittal with options selected.
 8. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
- F. Submittals Schedule: Comply with requirements in Division 1 Section "Construction Progress Documentation."
- G. Application for Payment: Comply with requirements in Division 1 Section "Payment Procedures."
- H. Schedule of Values: Comply with requirements in Division 1 Section "Payment Procedures."
- I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
1. Name, address, and telephone number of entity performing subcontract or supplying products.
 2. Number and title of related Specification Section(s) covered by subcontract.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken, as follows (see sample at the end of this section):
 - 1. Approved: Fabrication/installation may be undertaken. Approval does not authorize changes in the contract sum or contract time.
 - 2. Approved as Noted: Fabrication/installation may be undertaken subject to compliance with the noted comments. Approval does not authorize changes in the contract sum or contract time.
 - 3. Revise and Resubmit: Fabrication/installation may not be undertaken, Revise submittals in accordance with the noted comments. In resubmittal, limit corrections to the items marked and comments noted.
 - 4. Rejected: Fabrication/installation may not be undertaken. See noted reason(s) for rejection.
- C. Informational Submittals: Architect will review each submittal and will not return it, or will reject and return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- D. Partial submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- E. Submittals not required by the Contract Documents will not be reviewed and may be discarded.

END OF SECTION 01330

SECTION 01400 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Sections include the following:
 - 1. Divisions 2 through 16 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.
- D. Preconstruction Testing: Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- J. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.
- K. Extended Warranties: Those warranties required by the Contract Documents with a warranty period greater than the one year general contractor's warranty.

1.4 CONFLICTING REQUIREMENTS

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

1.5 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Description of test and inspection.
 - 3. Identification of applicable standards.

4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

C. Reports: Prepare and submit certified written reports that include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

E. Contractor must submit an inventory of all attic stock to be turned over to Owner/Architect and it must be signed off/verified by the Architect.

1.6 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- G. Testing Agency Qualifications: An independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
1. Testing Agencies must be approved in writing by the Owner/Architect before Contractor actually engages the Agency for services.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, mockups, and laboratory mockups; do not reuse products on Project.
 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- J. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
 2. Notify Architect seven days in advance of dates and times when mockups will be constructed.
 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 4. Obtain Architect's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 6. Demolish and remove mockups when directed, unless otherwise indicated.

- K. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Sections in Divisions 2 through 16.

1.7 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.
- B. The Owner will be responsible for the following quality-control testing services and inspections:
1. Soil testing as required by Division 2 "Earthwork", excluding NPDES monitoring.
 2. Asphalt testing as required by Division 2 "Hot-Mix Asphalt Paving".
 3. Concrete testing as required by Division 3 "Cast-in-Place Concrete".
 4. Testing and inspection of unit masonry assemblies as required by Division 4 "Unit Masonry Assemblies".
 5. Testing and inspection of structural steel as required by Division 5 "Structural Steel".
- C. Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
3. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 4. Contractor shall be responsible for notifying all testing agencies including those provided by the Owner and coordinating all testing and inspections with the project schedule. Notify testing/inspection agencies at least 24 hours in advance of time when work that requires testing or inspection will be performed.
 5. Contractor shall insure that testing and inspections provided by the Owner are done within reasonable working hours and not on overtime hours. Costs associated with overtime hours required by the Owner's testing agency due to the faulty scheduling of the Contractor will be charged to the Contractor, and the Contract sum will be adjusted by Change Order.
 6. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 7. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 8. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 9. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

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

E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, all cost for retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents are the responsibility of the Contractor.

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

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

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

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

H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for the Notice to Proceed.

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

1.8 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Owner will engage a qualified special inspector to conduct special tests and inspections required by Chapter 17 of the Georgia Standard Building Code (International Building Code), 2006 Ed. With Georgia Amendments as follows:

1. Owner will provide Special Test and Inspections in accordance with the "Statement of Special Inspections" and "Schedule of Special Inspection Services," forms included at the end of Part 3 of the Specification Section.
 - a. All testing/inspections indicated as applicable to this Project shall be performed in accordance with and to the extent indicated on the "Schedule of Special Inspections".
 - b. The Owner will be responsible for identifying the Agent (Special Inspector(s)) provided for the Project.
 - c. These forms shall be maintained in a central location at the Project Site. These forms will need to be accessed on a regular basis by the Agent (Special Inspector(s)) for the Project.
 - d. When an individual Special Inspection task in the Schedule is completed for the last time on the Project and the Special Inspector has performed their final review, inspection, or test of that item for the Project, the Special Instructor shall initial and date the cell in the completed column on the forms adjacent to the task.

2. Special Inspectors shall keep records of all tests and inspections. The Special Inspector shall provide copies of Inspection Reports to the Contractor, Architect, Engineer of Record, and the Building Official.
 - a. Reports shall indicate that the Work inspected was done in conformance to the Contract Documents. Work not in conformance with the Contract Documents shall be brought to the attention of the Contractor for immediate correction. Retesting/inspection shall be performed to insure compliance with Contract Documents.
3. A "Final Report of Special Inspections" shall be provided for the Project at the completion of all Special Inspections and Testing required for this Project. See "Final Report of Special Inspections" Form at the end of Part 3 of this Specification Section.
 - a. Each Special Inspector corresponding to an Agent in the "Schedule of Special Inspections" shall be required to complete a copy of this form.
 - b. Copies of all "Final Report(s) of Special Inspections" shall be provided to the Contractor, Architect, Engineer of Record, and the Building Official.
 - c. Special Inspections will not be considered complete until all forms from all Agents (Special Inspector(s)) have been received.
4. The Contractor shall not proceed with additional work until work has been inspected and passed inspection. Installation of new work over uninspected or failed work will not be acceptable.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Prepare a record of tests and inspections. Include the following:
 1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 1. Provide materials and comply with installation requirements specified in other Specification Sections. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
- B. Protect construction exposed by or for quality-control service activities.

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

END OF SECTION 01400.

SECTION 01420 - REFERENCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": The term "approved," when used in conjunction with Architect's action on Contractor's submittals, applications, and requests, is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by Architect, requested by Architect, and similar phrases.
- D. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on Drawings; or to other paragraphs or schedules in Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference.
- E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": The term "furnish" means to supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": The term "install" describes operations at Project site including unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.
- I. "Installer": An installer is Contractor or another entity engaged by Contractor, as an employee, subcontractor, or contractor of lower tier, to perform a particular construction operation, including installation, erection, application, and similar operations.
- J. The term "experienced," when used with the term "installer," means having successfully completed a minimum of 5 (five) previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

- K. "Project site" is the space available for performing construction activities, either exclusively or in conjunction with others performing other work as part of Project. The extent of Project site is shown on the Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Conflicting Requirements: Where compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.
1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to Architect for a decision before proceeding.
- C. Abbreviations and Names: Abbreviations and acronyms are frequently used in the Specifications and other Contract Documents to represent the name of a trade association, standards-developing organization, authorities having jurisdiction, or other entity in the context of referencing a standard or publication. Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they mean the recognized name of these entities. Refer to Gale Research's "Encyclopedia of Associations" or Columbia Books' "National Trade & Professional Associations of the U.S.," which are available in most libraries.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01420

SECTION 01500 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.
- B. Temporary utilities include, but are not limited to, the following:
 - 1. Sewers and drainage.
 - 2. Water service and distribution.
 - 3. Sanitary facilities, including toilets, wash facilities, and drinking-water facilities.
 - 4. Heating and cooling facilities.
 - 5. Ventilation.
 - 6. Electric power service.
 - 7. Lighting.
 - 8. Telephone service.
 - 9. Gas.
- C. Support facilities include, but are not limited to, the following:
 - 1. Temporary roads and paving.
 - 2. Dewatering facilities and drains.
 - 3. Project identification and temporary signs.
 - 4. Field offices.
 - 5. Storage and fabrication sheds.
 - 6. Lifts and hoists.
 - 7. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities include, but are not limited to, the following:
 - 1. Environmental protection.
 - 2. Stormwater control.
 - 3. Tree and plant protection.
 - 4. Pest control.
 - 5. Site enclosure fence.
 - 6. Barricades, warning signs, and lights.
 - 7. Covered walkways.
 - 8. Temporary enclosures.
 - 9. Temporary partitions.

1.3 DEFINITIONS

- A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.4 USE CHARGES

- A. General: Cost or use charges for temporary facilities are not chargeable to Owner or Architect and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:
 - 1. Owner's construction forces.
 - 2. Occupants of Project.
 - 3. Architect.
 - 4. Testing agencies.
 - 5. Personnel of authorities having jurisdiction.
- B. Electric Power Service: Pay electric power service use charges, whether metered or otherwise, for electricity used by all entities engaged in construction activities at Project site.

1.5 QUALITY ASSURANCE

- A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
 - 1. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

- A. Temporary Utilities: At earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of permanent service.
 - 1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.
- B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
 - 1. Keep temporary services and facilities clean and neat.
 - 2. Relocate temporary services and facilities as required by progress of the Work.
 - 3. No temporary living quarters are allowed on site.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Architect. Provide materials suitable for use intended.
- B. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.76-mm-) thick, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts.

- C. Portable Chain-Link Fencing: Minimum 2-inch (50-mm) 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide galvanized steel bases for supporting posts.
- D. Wood Enclosure Fence: Plywood, **6 feet (1.8 m)** high, framed with four 2-by-4-inch (50-by-100-mm) rails, with preservative-treated wood posts spaced not more than 8 feet (2.4 m) apart.
- E. Gypsum Board: Minimum 1/2 inch (12.7 mm) thick by 48 inches (1219 mm) wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C 36.
- F. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively.
- G. Paint: Comply with requirements in Division 9 Section "Painting."
- H. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.
- I. Water: Potable.

2.2 EQUIPMENT

- A. General: Provide equipment suitable for use intended.
- B. Field Offices: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- C. Common-Use Field Offices: Of sufficient size to accommodate needs of construction personal office activities and to accommodate project meetings specified in other Division 1 Section. Keep office clean and orderly. Furnish and equip offices as follows:
 - 1. Furniture required for project-size documents including file cabinets, plan tables, plan racks, and bookcases.
 - 2. Conference room of sufficient size to accommodate meetings of at least 10 individuals. Provide electrical power services and 120v ac duplex receptacles, with at less 2 receptacle on each wall. Furnish room with conference table, chairs, and 4' long tack and markerboard.
 - 3. Provide drinking fountain and private toilet.
 - 4. Contractor shall have computer access to internet, Wi-Fi access for owner and architect along with the ability to send and receive construction photographs digitally on a daily basis.
 - 5. Contractor shall also have facilities to scan, fax, and print documents on site.
 - 6. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68° to 72°.
 - 7. Lighting fixtures capable of maintaining average illumination of 20 fc at desk height.
- D. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.
 - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- E. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- F. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 2. Heating Units: Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.
- G. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.
- H. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
 2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
 3. Obtain easements to bring temporary utilities to Project site where Owner's easements cannot be used for that purpose.
- B. Water Service: Use of Owner's existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use. Utility use to be paid by contractor. Any additional water to be installed and paid for by the contractor.
1. Provide rubber hoses as necessary to serve Project site.
 2. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.

2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy.
- D. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed.
 1. Maintain a minimum temperature of 50 deg F (10 deg C) in permanently enclosed portions of building for normal construction activities, and 65 deg F (18.3 deg C) for finishing activities and areas where finished Work has been installed.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear.
 1. Install electric power service underground, unless overhead service must be used.
 2. Install power distribution wiring overhead and rise vertically where least exposed to damage.
- G. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.
 1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
 2. Provide warning signs at power outlets other than 110 to 120 V.
 3. Provide metal conduit, tubing, or metallic cable for wiring exposed to possible damage. Provide rigid steel conduits for wiring exposed on grades, floors, decks, or other traffic areas.
 4. Provide metal conduit enclosures or boxes for wiring devices.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.
- I. Telephone Service: Provide temporary telephone service throughout construction period for common-use facilities used by all personnel engaged in construction activities.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access as directed by architect.
 2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate to support loads and to withstand exposure to traffic during construction period and as required by authorities having jurisdiction. Locate temporary roads and paved areas in same location as permanent

roads and paved areas. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

1. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
 2. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Division 2 Section "Earthwork."
 3. Recondition base after temporary use, including removing contaminated material, regrading, proofrolling, compacting, and testing.
- C. Traffic Controls: Provide temporary traffic controls at junction of temporary roads with public roads. Include warning signs for public traffic and "STOP" signs for entrance onto public roads. Comply with requirements of authorities having jurisdiction.
- D. Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes indicated. Install signs as directed to inform public and persons seeking entrance to Project. Final information included on the sign is subject to change. A layout must be submitted to the Architect for approval prior to construction of the project identification signs. Do not permit installation of unauthorized signs.
1. Engage an experienced sign painter to apply graphics for Project identification signs. Comply with details indicated.
 2. Prepare temporary signs to provide directional information to construction personnel and visitors.
 3. Construct signs of exterior-type Grade B-B high-density concrete form overlay plywood in sizes and thicknesses indicated. Support on posts or framing of preservative-treated wood or steel.
 4. Paint sign panel and applied graphics with exterior-grade alkyd gloss enamel over exterior primer.
 5. Project identification signs are shown at end of this section.
- E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division 1 Section "Execution Requirements" for progress cleaning requirements.
1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.
- F. Janitorial Services: Provide janitorial services on a daily basis for temporary offices, first-aid stations, toilets, wash facilities, lunchrooms, and similar areas.
- G. Common-Use Field Office: Provide an insulated, weathertight, air-conditioned field office for use as a common facility by all personnel engaged in construction activities; of sufficient size to accommodate required office personnel and meetings. Keep office clean and orderly.
- H. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility services. Sheds may be open shelters or fully enclosed spaces within building or elsewhere on-site.
- 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION
- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.

- B. Stormwater Control: Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of stormwater from heavy rains.
- C. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from construction damage. Protect tree root systems from damage, flooding, and erosion.
- D. Site Enclosure Fence: Before construction operations begin, install portable chain-link enclosure fence with lockable entrance gates. Locate where indicated, or enclose entire Project site or portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering site except by entrance gates.
- E. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
- F. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.
- G. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
 - 2. Install tarpaulins securely using fire-retardant-treated wood framing and other materials.
 - 3. Where temporary wood or plywood enclosure exceeds 100 sq. ft. (9.2 sq. m) in area, use fire-retardant-treated material for framing and main sheathing.
- H. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.
 - 1. Construct dustproof partitions of not less than nominal 4-inch (100-mm) studs, 5/8-inch (16-mm) gypsum wallboard with joints taped on occupied side, and 1/2-inch (13-mm) fire-retardant plywood on construction side.
 - 2. Insulate partitions to provide noise protection to occupied areas.
 - 3. Seal joints and perimeter. Equip partitions with dustproof doors and security locks.
 - 4. Protect air-handling equipment.
 - 5. Weatherstrip openings.
- I. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
 - 1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.
 - a. Field Offices: Class A stored-pressure water-type extinguishers.
 - b. Other Locations: Class ABC dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for exposures.

- c. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.
2. Store combustible materials in containers in fire-safe locations.
3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
5. Permanent Fire Protection: At earliest feasible date in each area of Project, complete installation of permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.
6. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.
 1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 2. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Temporary Facility Changeover: Except for using permanent fire protection as soon as available, do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1 Section "Closeout Procedures."

END OF SECTION 01500

SECTION 01700 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. General installation of products.
 - 4. Coordination of Owner-installed products.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.
 - 8. Correction of the Work.
- B. Related Sections include the following:
 - 1. Division 1 Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.
 - 2. Division 1 Section "Submittal Procedures" for submitting surveys.
 - 3. Division 1 Section "Cutting and Patching" for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.
 - 4. Division 1 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 - 1. Before construction, verify the location and points of connection of utility services.

- B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 3. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 4. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Architect and Owner not less than 5 (five) days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Architect's or Owner's written permission.
- C. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- E. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor/professional engineer to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 3. Inform installers of lines and levels to which they must comply.
 - 4. Check the location, level and plumb, of every major element as the Work progresses.
 - 5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 - 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
- G. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction forces.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces.
 - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 - 2. Preinstallation Conferences: Include Owner's construction forces at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F (27 deg C).
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.
 - 1. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.
- H. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- I. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- J. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- K. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.10 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Restore permanent facilities used during construction to their specified condition.
- C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01700

SECTION 01731 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. Related Sections include the following:
 - 1. Divisions 2 through 16 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
 - a. Requirements in this Section apply to mechanical and electrical installations. Refer to Divisions 15 and 16 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 DEFINITIONS

- A. Cutting: Removal of existing construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
 - 2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
 - 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.

7. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.5 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
 1. Primary operational systems and equipment.
 2. Air or smoke barriers.
 3. Fire-protection systems.
 4. Control systems.
 5. Communication systems.
 6. Electrical wiring systems.
 7. Operating systems of special construction in Division 13 Sections.
- C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
 1. Water, moisture, or vapor barriers.
 2. Membranes and flashings.
 3. Exterior curtain-wall construction.
 4. Equipment supports.
 5. Piping, ductwork, vessels, and equipment.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.6 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to interruption of services to occupied areas.
- E. Maintain all existing exits and corridors in operation throughout construction.

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.

5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting. Patch back surrounding surfaces.
 6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang existing ceilings if scheduled to remain as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

END OF SECTION 01731

SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection procedures.
 - 2. Project Record Documents.
 - 3. Operation and maintenance manuals.
 - 4. Warranties.
 - 5. Instruction of Owner's personnel.
 - 6. Final cleaning.
- B. Related Sections include the following:
 - 1. Division 1 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
 - 2. Division 1 Section "Construction Progress Documentation" for submitting Final Completion construction photographs and negatives.
 - 3. Division 1 Section "Execution Requirements" for progress cleaning of Project site.
 - 4. Division 1 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 5. Division 1 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 6. Divisions 2 through 16 Sections for specific closeout and special cleaning requirements for products of those Sections.
- C. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following.
 - 1. Prepare a list of items to be completed and corrected (General Contractors Punch List), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases. Final certificate of occupancy from fire marshal having jurisdiction and other authorities having jurisdiction must be submitted to Architect.
 - 5. Prepare Project Record Documents (As Builts), operation and maintenance manuals, Closeouts Documents, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.

6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Complete startup testing of systems.
8. Submit test/adjust/balance records.
9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
10. Request Owner of changeover in heat and other utilities.
11. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
12. Complete final cleaning requirements, including touchup painting.
13. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
14. Only after Owner's approval, make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
15. All power, lighting and electrical systems including TV Systems shall be complete.
16. All emergency systems including fire alarm, sprinkler, and emergency power back-up systems shall be complete.
17. All egress systems and hardware shall be complete.
18. Visual completion: The interior and the exterior including sitework shall have an acceptable aesthetic appearance.
19. There shall be no rejected work items.
20. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
21. Perform demonstration of equipment as stated in the Food Services Equipment, 11400.
22. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
23. The General Contractor shall have tagged, identified, and organized the following keys, tools, and wrenches and shall have turned them over to the Owner:
 - a. Doors
 - b. Electrical panels
 - c. Hose bibbs – 1 key per hose bibb
 - d. Light switches – 1 key per switch
 - e. Door closers
 - f. Fire alarm cabinets
 - g. HVAC control panels
 - h. Any and all other keys associated with Project

D. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 5. Submit all required warranties.
 6. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion or when the Owner took possession of and assumed responsibility for corresponding elements of the Work.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will certify an approved final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected. Contractor shall reimburse the Owner for final re-inspections for time incurred in re-inspections at the rate of \$135.00 per hour for each inspector on team.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit an electronic copy of the punch list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. List whom is responsible for each item.
 4. Date when item will be complete.
 5. Note any incomplete item and state why.

1.5 WARRANTIES

- A. Submittal Time: Upon issuance of Substantial Completion and prior to requesting final inspection, submit all contract-required warranties. All warranties required by the Contract Documents shall commence on the date of the Final Completion of the Work unless otherwise noted. Items that are incomplete at Substantial Completion or that are in non conformance with the project requirements shall be listed by the Architect to be re-evaluated at Final Completion. The warranties for any listed item will begin at Final completion not at Substantial.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
1. Bind warranties and bond in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8- ½ by 11-inch (215-by-280-mm) paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES", Project name, and name of Contractor.

4. Provide three (3) copies of the warranty binder & an electronic copy.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

1.6 CLOSEOUT DOCUMENTS – PROVIDE (1) HARD COPY & AN ELECTRONIC COPY

- A. Submit closeout documents in an organized heavy-duty, 3-ring, loose-leaf binder, in thickness necessary to accommodate contents. Identify on the cover of the binder the following:

Title:

Owner's Name:

Project Name:

Project Address:

Architect's Name:

Engineer's Name:

General Contractor's Name:

- B. Include as the first sheet of the binder a Table of Contents. The remainder of the binder shall be divided into sections. Provide plastic-covered tabs, clearly labeled, to separate each area of the Closeout Documents. The sections of the binder shall be as follows:

1. Section 1 – Contact List

- a. The contact list shall include the company name and or individual of each subcontractor and or individual that performed work on the project. It should also include a contact name, phone number (office & cellular), fax number, e-mail address and job performed.

2. Section 2 - Warranties

- a. See Section 01740 – Warranties for warranty requirements. All warranties dates shall start on date of final completion.

3. Section 3 – Release of Lien and Affidavit

- a. Provide a properly executed Final Waiver of Lien from each subcontractor, sub-subcontractor and or individual performing work on the Project.

4. Section 4 – Operation and Maintenance Manuals

- a. The Operation and Maintenance Manuals shall be submitted in separate binders. Include in this binder a transmittal letter showing that the Operation and Maintenance Manuals have been delivered to the architect and who received and signed for the delivery and the date delivered. The Operation and Maintenance Manuals delivered to the Architect shall be as follows:

1. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:

- aa. Operation Data:

1. Emergency instructions and procedures.
2. System, subsystem, and equipment descriptions, including operating standards.
3. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
4. Description of controls and sequence of operations.
5. Piping diagrams.

- bb. Maintenance Data:

1. Manufacturer's information, including list of spare parts.
 2. Name, address, and telephone number of installer or supplier.
 3. Maintenance procedures.
 4. Maintenance and service schedules for preventive and routine maintenance.
 5. Maintenance record forms.
 6. Sources of spare parts and maintenance materials.
 7. Copies of maintenance service agreements.
 8. Copies of warranties and bonds.
2. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.
5. Section 5 – Project Record Documents (As-Built)
- a. Contractor shall provide Owner/Architect with CAD drawing files of all Project Record Document (As-builts).
 - b. The Project Record Documents shall be submitted in a separate package (provide one hard copy with an electronic copy). Include in this binder a transmittal letter showing that the Project Record Documents have been delivered to the architect and who received and signed for the delivery and the date delivered. The "As-Built" drawings and specifications shall comply with the following:
 1. General: Do not use Project Record Documents for construction purposes. Protect Project Record from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.
 2. Record Drawings: Maintain and submit one set of black-line white prints of Contract Drawings and Shop Drawings.
 - a. Mark Record Prints (As-Builts) to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.
 - b. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
 - c. Accurately record information in an understandable drawing technique.
 - d. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - e. Content: Types of items requiring marking include, but are not limited to, the following:
 - i. Post all Addenda on Drawings
 - ii. Dimensional changes to Drawings
 - iii. Revisions to details shown on Drawings
 - iv. Depths of foundations below first floor
 - v. Locations and depths of underground utilities
 - vi. Revisions to routing of piping and conduits
 - vii. Revisions to electrical circuitry
 - viii. Actual equipment locations
 - ix. Duct size and routing
 - x. Locations of concealed internal utilities
 - xi. Changes made by Change Order or Field Order
 - xii. Changes made following Architect's written orders
 - xiii. Details not on the original Contract Drawings
 - xiv. Field record for variable and concealed conditions
 - xv. Record information on the Work is shown only schematically

- f. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked show cross-reference on Contract Drawings.
 - g. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
 - h. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - i. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
 - j. Identify and date each Record Drawing; include the designation “PROJECT RECORD DRAWING” in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.
- 6. Section 6 – Project Record Documents (Specifications)
 - a. Record Specifications: Submit one hard copy and an electronic copy of Project’s Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3. Note related Change Orders, where applicable.
- 7. Section 7 – Permits and Reports
 - a. Provide a copy of all permits and inspection reports that were required during the construction of the project. Including, but not limited to Building Permit, Building Inspector inspection reports, Fire Marshall Inspection Reports, Utility Inspections, Equipment Start-Up Reports, etc.
- 8. Section 9 – Spare Parts and Maintenance Stock
 - a. Provide a signed transmittal letter indicating that all spare parts and maintenance stock of materials has been delivered as required by various Sections of the Specifications. The transmittal letter shall indicate what items have been delivered, the quantity, where delivered, who received and the date received.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 DEMONSTRATION AND TRAINING

- A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Provide instructors experienced in operation and maintenance procedures.
 - 2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
 - 3. Schedule training with Owner with at least 7 (seven) days' advance notice.
 - 4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

- B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline. Include instruction for the following:
 - 1. System design and operational philosophy.
 - 2. Review of documentation.
 - 3. Operations.
 - 4. Adjustments.
 - 5. Troubleshooting.
 - 6. Maintenance.
 - 7. Repair.

3.2 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturers written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.

- k. Remove labels that are not permanent.
 - l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - m. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Replace parts subject to unusual operating conditions.
 - o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - q. Clean ducts, blowers, and coils if units were operated without filters during construction.
 - r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - s. Leave Project clean and ready for occupancy.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01770

SECTION 02000 - EROSION CONTROL

PART 1 - GENERAL

1.01 SUMMARY

A. THIS SECTION INCLUDES:

1. Erosion and sedimentation control devices and measures.
2. State of Georgia NPDES permit monitoring and reporting requirements.

1.02 RELATED DOCUMENTS/SECTIONS

- A. Contract documents and drawings, geotechnical soils engineering report. Refer to appropriate related sections as applicable.

1.03 REFERENCED STANDARDS

- A. The current Manual for Erosion and Sediment Control in Georgia (**MESCG**).
- B. State of Georgia current NPDES permit requirements for proposed construction activity.

When standards or specifications are indicated herein by reference, the referenced portion shall apply to the most recent edition of the publication and shall have the same force and effect as if they were included herein in their entirety.

1.04 DESCRIPTION OF WORK

- A. This work shall consist of erosion and sedimentation control measures and devices, installation and maintenance as shown on the drawings or directed by the authority having jurisdiction for the life of the Contract.
- B. When any construction, materials, or specifications for the same or similar item(s) are shown in more than one place in the construction documents, plans, or specifications, the more stringent requirement shall apply as determined by the Engineer.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. All materials and construction shall conform to the **Manual for Erosion and Sediment Control in Georgia** (hereinafter referred to as **MESCG**), current edition.
- B. Temporary and permanent grassing, landscaping, trees or other vegetation shall conform to the Contract documents, plans, and drawings and the MESCG. Contractor shall coordinate with Architect/Engineer on all phases of landscaping. Refer to MESCG for detailed planting specifications, dates, and appropriate materials.
- C. All erosion control Matting and Blankets materials shall be temporary matting and blankets and shall be biodegradable and photodegradable. Do not install permanent type matting or blankets which are non-biodegradable or non-photodegradable unless specifically shown on plans.

PART 3 – EXECUTION

3.01 EXECUTION

- A. **All erosion and sedimentation control measures shall be installed prior to any land disturbing activity in accordance with the MESCG.**

- B. **PERMANENT GRASSING REQUIREMENTS:**

THE CONTRACTOR SHALL ESTABLISH PERMANENT GRASSING PER PLANS AND SPECIFICATIONS ON ALL DISTURBED AREAS WHETHER SHOWN ON THE PLANS OR NOT. GRASS TYPE AND MATERIAL SUBJECT TO OWNER/ARCHITECT APPROVAL.

- C. **NPDES STORM WATER DISCHARGE MONITORING REQUIREMENTS:**

CONTRACTOR SHALL FULLY COMPLY WITH THE CURRENT STATE OF GEORGIA NPDES PERMIT REQUIREMENTS FOR NOTIFICATION, DOCUMENTATION, MONITORING, MAINTENANCE AND REPORTING REQUIREMENTS. CONTRACTOR SHALL SIGN AND CERTIFY SOLELY AS OPERATOR THE NOTICE OF INTENT (NOI), AND ANY OTHER CERTIFICATIONS, FORMS, FEES, OR APPLICATIONS REQUIRED FOR FULL COMPLIANCE. CONTRACTOR SHALL COPY TO OWNER IMMEDIATELY ALL

**NOTIFICATION, REPORTING, AND DOCUMENTATION REQUIRED
OR RELATED TO NPDES PERMIT REQUIREMENTS.**

- D. Construction exit shall be maintained in a condition which will prevent tracking or flow of mud onto public streets.
- E. All erosion control grassing and landscaping shall comply at a minimum with the "Vegetative Considerations" in the MSECG.
- F. All measures shown on the construction plans shall be installed. Additional measures may be required as necessary by the local authority having jurisdiction or the project Engineer.
- G. Erosion control devices shall be periodically inspected and repaired, cleaned out, or restored as needed in order to function properly until permanent erosion control measures are established.
- H. All disturbed areas shall be permanently grassed and landscaped as soon as possible after grade is established.
- J. All naturally occurring water, streams, creeks, lakes, springs, etc. present on site shall have a minimum 25 foot undisturbed natural buffer measured from the top of bank. Tributaries to the Chattahoochee River, designated trout streams, or other such water sources, shall have a buffer of 35 feet or more. Contractor shall confirm minimum buffer width as required by the State of Georgia. Local authority may require buffer width(s) greater than State of Georgia. Contractor shall determine minimum buffer width and maintain said buffer throughout construction. The Contractor shall not encroach this buffer whether shown on the plans or not unless a buffer waiver permit has been acquired.
- K. Install Rock Dams (Rd) at any and all points of concentrated flow which impacts any and all Silt Fence (Sd1). Concentrated flow may occur naturally or as a result of construction or temporary or final grading. The Contractor is responsible for field verification of any concentrated flow points which impact Silt Fence (Sd1) and installation of Rock Dams (Rd) at all such locations. Remove Silt Fence for required width of Rock Dam(s). Install Rock Dams so that all concentrated flow is filtered through the Rock Dams and no flow is allowed to bypass around the sides of the Rock Dams or between the Rock Dams and Silt Fence.

END OF SECTION 02000

SECTION 02100 – AS BUILT SURVEY

PART 1 - GENERAL

1.01 SUMMARY

A. THIS SECTION INCLUDES:

1. As built survey requirements.

1.02 RELATED DOCUMENTS/SECTIONS

- A. Contract documents and drawings. Refer to appropriate related sections as applicable.

1.03 REFERENCED STANDARDS

- A. State of Georgia surveying and plat laws and regulations.

1.04 DESCRIPTION OF WORK

- A. This work shall consist of as built survey and drawings for the entire completed site and building improvements.
- B. When any construction, materials, or specifications for the same or similar item(s) are shown in more than one place in the construction documents, plans, or specifications, the more stringent requirement shall apply as determined by the Engineer.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Reserved

PART 3 – EXECUTION

3.01 EXECUTION

- A. Contractor shall provide to Owner and Architect/Engineer a complete as built survey to include horizontal and vertical information for the

entire site and building improvements. The drawings and plats shall include, but not be limited to:

Boundary survey, location, site location map, elevation, height and square footage of all buildings, parking areas, drives, utilities, walls, storm sewer, all storm, sanitary, or other pipe sizes, depths, inverts, storm water pond(s) or facilities with complete topographic information on dams, volumes, complete as built information for all pond outlet control structures with drawings for structures, weirs, orifices, notches, spillways, and all other improvements, fences, out buildings, canopies, sidewalks, ramps, roadway improvements, decel lanes, left turn lanes, dumpster pads, transformers, loading areas, parking spaces, islands, play areas, signs, water meters and vaults, and all other site or building improvements.

- B. As Built survey(s) and drawings shall comply with Local Authority Having Jurisdiction (LAHJ) standards and specifications. The Contractor is responsible for verification of and compliance with LAHJ standards and specifications PRIOR TO CONSTRUCTION. As built survey(s) and drawings shall comply with horizontal and vertical datum as specified by the LAHJ. In the absence of LAHJ requirements for vertical and horizontal datum, contact Owner/Architect/Engineer for direction regarding horizontal and vertical datum requirements for survey prior to construction.
- C. As Built Survey(s) and drawings shall be completed and submitted to Owner/Architect/Engineer in a timely manner to allow for review and approval. Contractor shall not receive final release until As Built Survey(s) and drawings are approved by Owner/Architect/Engineer and accepted and approved by the LAHJ.

END OF SECTION 02100

SECTION 02110 - SITE CLEARING & DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. THIS SECTION INCLUDES:

1. Protection of existing trees to remain.
2. Removal of surface debris, trees, and other vegetation not designated to remain.
3. Topsoil excavation.
4. Clearing and grubbing.
5. Demolition.
6. Disposal of waste materials.

1.02 RELATED DOCUMENTS / SECTIONS

- ##### A.
- Contract documents and drawings, geotechnical soils engineering report. Refer to appropriate related sections as applicable.

1.03 REGULATORY REQUIREMENTS

- ##### A.
- Verify and conform to all Federal, State, County or local requirements concerning site clearing and related activities.
- ##### B.
- Coordinate and obtain approval for all clearing and demolition work with all appropriate utility companies prior to start of construction.

C. **WARNING:**

CONTRACTOR SHALL: COMPLY WITH ALL OSHA, FEDERAL, STATE, LOCAL, AND INDUSTRY STANDARD SAFETY MEASURES, DEVICES, PROCEDURES, PRECAUTIONS, AND EQUIPMENT FOR ALL WORK OR OTHER ACTIVITIE(S). NO PERSON(S) SHALL ENTER MANHOLES, CONFINED SPACES, OR OTHER UNDERGROUND STRUCTURES, SPACES, TRENCHES, OR EXCAVATIONS WITHOUT PROTECTIVE BREATHING APPARATUS AND ALL OTHER REQUIRED SAFETY MEASURES, DEVICES, PROCEDURES, AND EQUIPMENT, AND AT LEAST ONE OTHER PERSON PRESENT ABOVE GROUND FOR SAFETY AND MONITORING AT ALL TIMES. CONTRACTOR SHALL PROVIDE AND ENSURE USE OF SAFETY KITS, HELMETS, GLOVES, EMERGENCY OXYGEN RESUSCITATOR KITS, AND AIR QUALITY AND GAS DETECTORS FOR VOLATILE, TOXIC, OR EXPLOSIVE

GASES OR SUBSTANCES. VERIFY SAFE OXYGEN CONTENT PRIOR TO ENTERING MANHOLES, CONFINED SPACES, OR OTHER UNDERGROUND STRUCTURES.

1.04 DESCRIPTION

- A. This work shall consist of clearing, grubbing, removal and disposal of all vegetation and debris (not designated to remain) within the limits of construction, and demolition of all existing items, structures, improvements, or other elements designated to be removed or required to be removed for the completion of the work.
- B. When any construction, materials, or specifications for the same or similar item(s) are shown in more than one place in the construction documents, plans, and specifications, the more stringent requirement shall apply as determined by the Engineer.

PART 2 - EXECUTION

2.01 PREPARATION / PROTECTION

- A. Traffic: Do not close or obstruct streets, walks, or other occupied or used facilities without written permission from Owners or authorities having jurisdiction.
- B. Existing improvements: Provide measures necessary to protect adjoining properties and Owner's property from damage during site clearing. Damaged improvements shall be restored by the Contractor to their original condition, as acceptable to property owners.
- C. The contractor shall coordinate with the all utility authorities the location, size and material, origin, identification, and verification of all existing utilities onsite. Utilities which are to remain shall be protected from damage during construction.
- D. Existing trees, shrubs, or other vegetation designated to remain shall be protected and clearly delineated or marked for visual identification. The contractor shall coordinate with the Architect/Engineer on protection measures to ensure that any necessary cutting, grading, or other work in close proximity to trees or other vegetation is done in a manner which will minimize potential damage.
- E. The contractor shall protect bench marks and existing structures from

damage or displacement.

2.03 CLEARING

- A. Definition: Clearing consists of the removal from the site and proper disposal of all exposed objectionable matter such as trees, brush, logs, grass, weeds, roots, decayed vegetable matter, poles, stubs, rubbish, refuse dumps, sawdust piles, loose boulders of one cubic yard or less outside of construction limits, and other debris resting on or protruding through the ground surface, or appearing on the site.
- B. Clearing also includes the removal and proper disposal of all obstructions not to be retained.
- C. Clearing may be done by any legal method the contractor elects to use provided no damage is done to the property, trees or vegetation to be retained, in or outside of the site.
- D. Remove any remaining pavement, curbing, or other site improvement or obstruction necessary to facilitate the proposed construction as shown on the contract documents and drawings.

2.04 GRUBBING

- A. Definition: Grubbing consists of the removal from the site and proper disposal of objectionable matter defined above under CLEARING, which is imbedded in the underlying soil.
- B. Use only hand methods for grubbing required within five feet of drip lines of trees designated to remain and tree protection limits.
- C. Objectionable Roots: Objectionable roots are defined as (1) matted trees and brush roots regardless of the size of the roots; (2) individual roots more than 3/4 inch diameter; (3) individual roots more than 36 inches long regardless of the size; (4) large quantities of lesser size roots present in the top 12 inches of the finished subgrade.
- D. When these items are removed as clearing and grubbing, they shall be removed to the following depths:
 - (1) Under pavements: Remove to a depth of 3.0 feet minimum below finish subgrade.
 - (2) Beneath other structures: Remove to a depth of 3.0 feet

minimum below finish subgrade.

- (3) Elsewhere on the site: Remove to a depth of 3.0 feet minimum below the finished surface for slopes and shoulders, 1.0 feet below natural ground outside construction limits.

2.05 TOPSOIL EXCAVATION

- A. Definition: Topsoil is defined as friable clay loam surface soil found in varying depths onsite. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 1/2 inch in diameter, without weeds, roots, or other objectionable material as defined in section 2.03 (A.)
- B. Topsoil excavation: Excavate topsoil to depths encountered in a manner which will minimize intermingling with underlying subsoil or objectionable material. Stockpile topsoil in storage piles to provide free drainage of surface water. Cover storage piles, if necessary, to prevent wind or water erosion. Dispose of unsuitable or excess topsoil as specified for disposal of waste materials. Do not excavate wet topsoil.

2.06 DEMOLITION

- A. **THE CONTRACTOR IS FULLY AND COMPLETELY RESPONSIBLE FOR LOCATION, VERIFICATION, PROTECTION, STORAGE, MAINTENANCE, DEMOLITION, REMOVAL, RELOCATION OR ALTERATION OF ALL EXISTING SITE UTILITIES, SITE IMPROVEMENTS, STRUCTURES, OR CONSTRUCTION ELEMENTS AS REQUIRED TO COMPLETE THE WORK, WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL VISIT THE SITE AND BECOME THOROUGHLY FAMILIAR WITH ALL EXISTING IMPROVEMENTS, UTILITIES, AND SITE CONDITIONS PRIOR TO BIDDING AND CONSTRUCTION.**
- B. Items designated or required to be removed shall be completely removed and disposed of offsite in a legal manner. All items to be removed shall be removed in their entirety including all associated elements, layers, materials, sections, foundations, equipment, or levels; removal shall continue to the natural soil subgrade level at which all items designated for removal have been removed. No digging or removal past the natural soil subgrade level at which all items designated for removal have been removed is permitted.

- C. Protect all items not designated for removal from damage, encroachment, or disturbance. All damaged items shall be restored completely by Contractor at no expense to Owner.

2.07 DISPOSAL OF WASTE MATERIALS

- A. Contractor shall dispose of all waste material offsite in a legal manner.
- B. Burning: Burning will be permitted only by legally authorized permit, subject to permit requirements.
- C. Burying onsite is prohibited.

END OF SECTION 02110

SECTION 02200 – EARTHWORK

PART 1 - GENERAL

1.01 SUMMARY

A. THIS SECTION INCLUDES:

1. Project conditions
2. Quality assurance
3. Rough Grading
4. Proof rolling
5. Submittals
6. Excavating
7. Backfill and fill
8. Trenching
9. Rock removal
10. Disposal

1.02 RELATED DOCUMENTS / SECTIONS

- A. Contract documents and drawings, geotechnical soils report (if available). Refer to appropriate related sections as necessary.

1.03 REFERENCES

- A. AASHTO - M147 - Materials for aggregate and soil aggregate.
- B. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb. (4.45 kg) Rammer and an 18-in. (457 mm) drop.
- C. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Course Aggregates.
- D. ANSI/ASTM D698 - Standard Proctor Test - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using a 5.5 lb. (2.49 kg) Rammer and 12 inch (304.8 mm) drop.
- E. ANSI/ASTM D1557 - Modified Proctor Test - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.45 kg) Rammer and 18 inch (457 mm) Drop.
- F. ASTM D2167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- G. ASTM D2487 - Classification of Soils for Engineering Purposes.
- H. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

- I. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.
- J. ASTM D4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- K. ANSI/ASTM D1556 - Test Method for Density of Soil using the Sand-Cone Method.
- L. GE - Geotechnical Engineer, Engineering Report, Recommendations.
- M. NFPA - Code for explosive materials

When standards or specifications are indicated herein by reference, the referenced portion shall apply to the most recent edition of the publication and shall have the same force and effect as if they were included herein in their entirety.

1.04 REGULATORY REQUIREMENTS

- A. Verify and comply with all Federal, OSHA, State, County, City or local requirements concerning earthwork, excavation, and related activities.
- B. When any construction, materials, or specifications for the same or similar item(s) are shown in more than one place in the construction documents, plans, or specifications, the more stringent requirement shall apply as determined by the Engineer.
- C. **WARNING:**
CONTRACTOR SHALL: COMPLY WITH ALL OSHA, FEDERAL, STATE, LOCAL, AND INDUSTRY STANDARD SAFETY MEASURES, DEVICES, PROCEDURES, PRECAUTIONS, AND EQUIPMENT FOR ALL WORK OR OTHER ACTIVITIES(S). NO PERSON(S) SHALL ENTER MANHOLES, CONFINED SPACES, OR OTHER UNDERGROUND STRUCTURES, SPACES, TRENCHES, OR EXCAVATIONS WITHOUT PROTECTIVE BREATHING APPARATUS AND ALL OTHER REQUIRED SAFETY MEASURES, DEVICES, PROCEDURES, AND EQUIPMENT, AND AT LEAST ONE OTHER PERSON PRESENT ABOVE GROUND FOR SAFETY AND MONITORING AT ALL TIMES. CONTRACTOR SHALL PROVIDE AND ENSURE USE OF SAFETY KITS, HELMETS, GLOVES, EMERGENCY OXYGEN RESUSCITATOR KITS, AND AIR QUALITY AND GAS DETECTORS FOR VOLATILE, TOXIC, OR EXPLOSIVE GASES OR SUBSTANCES. VERIFY SAFE OXYGEN CONTENT PRIOR TO ENTERING MANHOLES, CONFINED SPACES, OR OTHER UNDERGROUND STRUCTURES.

1.05 PROJECT CONDITIONS

- A. Site information: All earthwork, cutting, filling, compaction, and related operations shall conform to the requirements and recommendations of the geotechnical Soils Engineer. In the absence of a qualified geotechnical Soils Engineer, the Contractor shall be fully responsible for the integrity, suitability, quantity, compaction, selection, and quality of the soils used in the completion of the Work.
- B. Protection of persons and property:
 - 1. Barricade all open excavations occurring as part of this work and post with warning lights.
 - 2. Operate warning lights or devices for all excavations, restricted or dangerous areas, or other areas as required for safety of all person(s) onsite or in the work area, as required BY OSHA, Federal, State, and local laws, or recommended by authorities having jurisdiction. All warning lights or devices shall be illuminated for night or low visibility conditions.
 - 3. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, or other hazards created by earthwork operations.
 - 4. The Contractor, and all sub-contractors, shall be responsible for all safety measures, procedures, or devices as required by OSHA, Federal, State, or local authorities. No person shall enter a manhole or other underground structure without protective breathing apparatus, and at least one other person present for safety. All earthwork, trenching, and grading operations shall conform to minimum OSHA requirements for safety, shoring, bracing, and protective measures.
- C. The Contractor is solely responsible for construction staging, phasing, and sequencing. Wet soils and wet soil remediation due to rainfall will not be justification for additional costs.

1.06 QUALITY ASSURANCE

- A. Testing and Inspection service: Contractor shall employ and pay for a qualified independent Geotechnical Engineer (GE) and geotechnical testing laboratory to perform soil testing and inspection services during earthwork operations and as specified by the Architect/Engineer. All testing, earthwork, excavation, cut and fill

operations and associated work shall comply with GE recommendations and standards at a minimum. GE shall be subject to approval of Owner/Architect/Engineer.

- B. Testing Laboratory Specifications: The Contractor shall obtain approval from the Owner/Architect/Engineer for the (GE) and the Testing Laboratory prior to beginning work.
- C. Field Testing: Allow testing laboratory to test and approve each subgrade and fill layer before further backfill or construction is performed.
 - 1. Field density tests shall be in accordance with ASTM D 698.
 - 2. The placement, location, number, and frequency of tests shall be as directed by the Geotechnical Engineer or authorized qualified Technician (GE or GT.)

1.07 SUBMITTALS

- A. Test reports: Submit the following test reports directly to the Architect, Engineer, and Owner or Owner's representative from the Testing Laboratory, with a copy to the Contractor:
 - 1. Test reports on borrow material.
 - 2. Field reports, in-place soil density tests.
 - 3. One optimum moisture-maximum density curve for each soil type encountered.
 - 4. Report of actual unconfined compressive strength and/or results of bearing tests of each strata tested.
 - 5. Topographic as-built survey (2.04 F)

PART 2 - EXECUTION

2.01 ROUGH GRADING

- A. Definition: Cutting, grading, filling, and rough contouring the site for building pads, structures, paving areas, or other improvements.

2.02 EXAMINATION

- A. All existing contours, elevations, structures, utilities, and other

improvements shown on the plans are taken from the best information available at the time and are believed to be reasonably true and correct. Any errors, omissions, or discrepancies between the actual field conditions and the plans discovered during construction must be reported immediately to the Architect and the Engineer. Any work done by the Contractor after such discovery without written approval from the Architect or Engineer will be at the Contractor's risk.

2.03 PREPARATION

- A. Identify and verify required lines, levels, contours, and datum.
- B. Utilities: Stake and flag locations of all utilities. Coordinate with all utilities and have existing locations clearly marked prior to construction. Protect above and below grade utilities to remain from damage. Notify prior to construction and coordinate with any utilities that will require removal and/or re-location.
- C. Provide protective measures or devices for all existing features to remain, including but not limited to: trees and vegetation, existing buildings and appurtenances, adjacent property improvements, or other structures.

2.04 EXCAVATION

- A. General: Comply with safety requirements of all Federal, State, County, City, or local authorities having jurisdiction.
- B. Excavate subsoil as shown on approved plans. Make grade changes gradual. Blend slopes into level areas.
- C. EARTHWORK VOLUME(S) FOR CUT AND FILL WILL NOT BALANCE. The contractor is solely responsible for establishing finished grades as shown on approved plans, including any earthwork export (haul-off) or earthwork import (offsite hauled in) required to establish permanent grades. All exported earthwork shall be disposed of offsite in a legal manner by the contractor. All imported earthwork shall be approved suitable material documented by the GE for conformity with specifications, intended use, and volume(s) imported.

- D. Provide Temporary Dewatering as required to facilitate all proposed earthwork and construction. See Dewatering specifications.
- E. Tolerances: Top surface of subgrade: Plus or minus 1/10 foot, provided positive drainage is established according to the design intent of the plans and specifications.
- F. As-Built topographic survey:
After rough grades are established, and before building foundations or other site improvements begin, the Contractor shall provide to the Owner at Contractor's expense an as-built topographic survey of the grades and graded areas as shown on the approved plans. The as-built topographic survey must be signed and sealed by a registered Surveyor licensed in the State where the project is located, and must show grading elevations, slopes, and contours to the extent necessary for the Owner to verify that the grading is in compliance with the approved plans and specifications. Do not proceed with any work in any area of the site until Owner is satisfied with results of as-built topographic survey. It is the Contractor's responsibility to schedule the as-built survey and account for the required time to complete the review process with the Owner to avoid delays to the project schedule.
- G. All soils used for fill in earthen dams or water impoundment areas shall be ML or CL low plasticity clays per the Unified Soil Classification, and must be approved by the Geotechnical Engineer. All organics, topsoil, or other unsuitable material shall be removed from the entire fill area. All fill shall be placed in maximum 6 inch lifts, minimum compaction is 95% of standard maximum density. No gravel, aggregate or gravel pipe bedding, or any pervious material shall be placed in the dam or fill area(s) or adjacent to any water impoundment perimeter(s). Scarify existing subgrade prior to placing fill.

2.05 ROCK EXCAVATION

- A. Rock excavation shall consist of all material which cannot be excavated except by drilling, blasting or wedging. It shall consist of un-decomposed stone hard enough to ring under a hammer, and the amount of solid stone shall be not less than one (1) cubic yard in volume. Rock is further defined as follows:
 - 1. General Excavation: Any material occupying an original volume of more than one cubic yard which cannot be excavated with a single-

tooth ripper drawn by a crawler tractor having a minimum draw bar pull rated at not less than 80,000 pounds sable pull (Caterpillar D-8 or larger), see 2.05(B).

2. Trench Excavation: Any material occupying an original volume of more than one half cubic yard which cannot be excavated with a backhoe having a bucket curling force rated at not less than 40,000 pounds, using a rock bucket and rock teeth (a John Deere 790 or larger).
- B. When rock is encountered, the earth shall be cleared away and any rock shall be exposed for classification.

Rock must be classified and verified as follows:

In the presence of the Owner, Architect, Engineer, and the Testing Lab, at the expense of the Contractor, rock must be pulled in three different and distinct directions with a single-tooth ripper drawn by a crawler tractor having a minimum draw bar pull rated at not less than 80,000 pounds sable pull (Caterpillar D-8 or larger). After pulling in three different directions, rock shall be classified according to 2.05 (A) (1.)

The Architect/Owner/Engineer shall be notified before any rock has been blasted or removed in any way.

- C. Boulders over one (1) cubic yard or rock as defined above shall be removed at a contractual unit price. Once rock is uncovered, grading sections shall be taken. When rock is completely removed, new grading sections shall be taken to determine the quantity of rock removed. Contractor shall bear the expense of taking grading sections.
- D. All blasting shall be done in accordance with local ordinances, and permits shall be obtained where required by law.
- E. Rock that is removed shall become the property of the Contractor and shall be removed from the site and/or buried as allowed by the specifications, and subject to GE approval.
- F. Decomposed rock and similar material that can be removed by tractor drawn ripper or power machinery as previously mentioned will be classified as earth excavation.
- G. When rock is encountered, clear away earth and notify Architect/Owner/Engineer. Architect/Engineer will inspect material and

issue written instructions. No rock excavation shall be done without written instructions. No rock excavation shall be done prior to measurement.

E. Measurement for Rock Excavation shall be as follows:

1. Mass Rock:

- a. Measurement for mass rock shall be made by taking cross sections or by other appropriate means identifying the contours of rock before and after removal. All rock measurements shall be made and certified by an independent licensed surveyor or engineer approved by the Architect.
- b. Rock removed prior to measurement shall not receive compensation.
- c. The quantity of rock shall be calculated using the following limits:
 - 1. To top of rock
 - 2. To 1.0 feet below finished grade of roadway
 - 3. To vertical lines at back of curb
 - 4. To 1.0 feet below foundations and footings
 - 5. To vertical faces located 1.0 feet horizontal distance from each footing or foundation face
 - 6. To 0.5 feet below slabs on grade
 - 7. To finish grade in cut where rock is removed to finish grade. Where it is not so removed, to the finish rock surface.

2. Trench Rock:

- a. Measurement for trench rock shall be made by taking level readings at reasonable intervals but not more than 10 feet along the exposed trench length before removal of rock. All rock measurements shall be made and certified by an independent licensed surveyor or engineer approved by the Owner/Architect.
- b. Rock removed prior to measurement shall not receive compensation.

- c. The quantity of rock shall be calculated using the following limits:
 - 1. To top of rock
 - 2. To vertical faces 1.0 feet beyond the outside of pipe barrel, each side
 - 3. To 12 inches below pipe barrel for the full trench length having rock
 - 4. To vertical faces located 1.0 feet horizontal distance beyond structures or manholes
 - 6. To 6 inches below bottom of slab for structures

E. Blasting or explosives:

- 1. All blasting or use of explosives shall be done by a company with at least five years documented experience specializing in use of explosives for disintegration of rock.
- 2. All blasting or use of explosives shall be done in strict accordance with the local authority having jurisdiction. Obtain all necessary permits or approvals prior to use of explosives. The Contractor is responsible for all Federal, State, and local safety requirements, ordinances, or laws regarding the use of explosives.
- 3. The Contractor shall conduct a survey with photographs of to document existing conditions of buildings adjacent to or near the location of rock removal prior to blasting. The Contractor shall advise and coordinate with all affected adjacent or nearby property owners in writing of the proposed blasting schedule. Obtain a seismic survey prior to rock excavation to determine maximum charges which may be used without damaging adjacent property, buildings, or structures. Provide seismographic monitoring during all blasting operations.
- 4. All blasting shall be completed before footings or foundation construction begins.
- 5. Rock which is removed shall become the property of the Contractor and shall be removed from the site and disposed of in a legal manner.
- 6. When rock is encountered, the Contractor shall immediately notify the Engineer in writing. Classification of rock and volume

calculations shall be done in accordance with the specifications and as directed by the Architect. The Engineer and/or the Architect will issue written instructions to the Contractor concerning rock work prior to any rock removal.

7. Payment will not be made for over excavated rock or for replacement materials.

2.06 BACKFILL AND FILL

- A. Fill materials: Fill shall be clean inorganic natural soil. Structural fill shall contain no rock fragments larger than 3 inches in the longest dimension. Soils proposed for fill shall have a target maximum dry density of 100 pounds per cubic foot or greater in Standard Proctor Compaction Test ASTM D698 or as directed by the GE. All fill materials must be approved by the Soils Engineer prior to placement. In the absence of a Soils Engineer, the Contractor is fully responsible for material or soil selected for fill. Any fill containing large quantities of rock or weathered rock shall not be used as structural fill.
- B. The Contractor shall coordinate testing as required by the Soils Engineer (GE) for all fill materials prior to their use.
- C. Execution: Placed fill materials used in backfilling or filling in layers shall not exceed the following loose depths or as directed by the Soils Engineer (GE):
 1. Heavy equipment compaction: 6-8 inches
 2. Hand operated tampers: 4-6 inches
- D. All areas of existing subgrade which require remediation, or are not capable of in-place compaction, shall be excavated and backfilled with structural fill material compacted to a density equal to or greater than requirements for subsequent fill material layers.
- E. Place fill simultaneously on opposite sides of walls, small structures, utility lines, trenches, etc. to avoid displacement or over stressing.
- F. In-place density requirements:
Compact soil to not less than the values given below, expressed as a percentage of maximum dry density at optimum moisture content per ASTM D698:

1. Structural fill: Paved areas, buildings, footings, structures, etc.: 95 percent minimum unless noted otherwise, or as recommended by the Geotechnical Engineer or the Geotechnical subsurface exploration analysis and evaluation, whichever is greater.
 2. Unpaved non-structural areas: 90 percent
 3. Exterior steps, walks, ramps, etc.: 95 percent
 4. Compacted fill behind walls: 95 percent
- G. Moisture Control: During compaction, control moisture of subgrades and subsequent lifts to within optimum moisture content tolerances as recommended by the GE. Wet surface or aerate soil as required.
- H. Backfilling:
1. Backfill areas to contours and elevations shown with approved unfrozen materials.
 2. Systematically backfill to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.
 3. Maintain moisture content within optimum range as specified by the GE.
 4. Compaction: See 2.06 (F) above.
 5. Slope grades away from buildings or other structures which may be damaged by water a minimum of 2 inches in 10 feet, unless noted otherwise.
 6. Tolerances: Plus or minus 1/10 foot.
- I. Protection of finished work: Protect all finished work. Re-shape and re-compact fills subjected to vehicular traffic as necessary.

2.07 TRENCHING

- A. Comply with all Federal, OSHA, State, County, City or local regulations regarding safety and construction. See Section 1.05 (4).
- B. Maintain and protect all utilities above and below ground designated to remain. Contractor to coordinate with all utilities and authorities having jurisdiction regarding construction procedures such as utility service connections, maintenance of service(s), notification procedures, tapping or extension specifications, and other related items.

- C. Cut trenches sufficiently wide to enable installation and inspection. The minimum bedding for all pipes is Class B as shown on the plans unless specified otherwise.
- D. Backfill trenches to correct elevations with approved materials only. Do not backfill over porous, wet, or spongy subgrade surfaces.
- E. Maintain maximum moisture content range to ensure required compaction density.

2.08 DISPOSAL

- A. The contractor shall remove from the Owner's property all waste material, unsuitable excavated material, trash and debris, and dispose of it offsite in a legal manner.

2.09 GEOTECHNICAL SOILS STUDY

- A. If a Geotechnical Soils Study has been performed, a copy of the Geotechnical Soils Study will be made available to the Contractor or included in the specifications following this Section. The Soils Study is for reference only. All conclusions, estimates, or decisions made regarding the contents of the Study are the sole responsibility of the person(s) reading the Study.

END OF SECTION 02200

SECTION 02230 ASPHALTIC CONCRETE PAVEMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. THIS SECTION INCLUDES:
 - 1. Aggregate materials
 - 2. Aggregate base course
 - 3. Asphaltic concrete pavement

1.02 RELATED DOCUMENTS / SECTIONS

- A. Contract documents and drawings, State of Georgia Department of Transportation Standards and Specifications (GA DOT), current edition. Refer to appropriate related sections as applicable.

1.03 REFERENCES

- A. AASHTO - M147 - Materials for aggregate and soil aggregate.
- B. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb. (4.45 kg) Rammer and an 18-in. (457 mm) drop.
- C. ANSI/ASTM C136 - Method for Sieve Analysis of Fine and Course Aggregates.
- D. ANSI/ASTM D698 - Standard Proctor Test - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using a 5.5 lb. (2.49 kg) Rammer and 12 inch (304.8 mm) drop.
- E. ANSI/ASTM D1557 - Modified Proctor Test - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.45 kg) Rammer and 18 inch (457 mm) Drop.
- F. ASTM D2167 - Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method.
- G. ASTM D2487 - Classification of Soils for Engineering Purposes.
- H. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- I. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.
- J. ASTM D4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- K. ANSI/ASTM D1556 - Test Method for Density of Soil using the Sand-Cone Method.

When standards or specifications are indicated herein by reference, the referenced portion shall apply to the most recent edition of the publication and shall have the same force and effect as if they were included herein in their entirety.

1.04 PAYMENT ISSUE

- A. Materials testing to be done at Contractor's expense. Testing firm to be approved by Architect/Engineer.

1.05 DESCRIPTION OF WORK

- A. When any construction, materials, or specifications for the same or similar item(s) are shown in more than one place in the construction documents, plans, or specifications, the more stringent requirement shall apply as determined by the Engineer.

PART 2 - PRODUCTS

2.01 AGGREGATE MATERIALS

- A. Coarse Aggregate Type A (Gravel): AASHTO M147, Grade A; passing the No. 40 sieve with a liquid limit of not more than 25; a plasticity index of not more than 5 in accordance with ASTM D4318.
- B. Coarse Aggregate Type 2 (Gravel): Crushed: friable material and debris, graded in accordance with ANSI/ASTM C136, within the following limits:

Sieve Size	Percent Passing
2 inches	100
1 inch	95
3/4 inch	95 to 100
5/8 inch	75 to 100
3/8 inch	55 to 85
No. 4	35 to 60
No. 16	15 to 35
No. 40	10 to 25
No. 200	5 to 10

- C. Aggregate Type A3 (Pea Gravel): Natural Stone; washed, free of shale, clay, organic matter; graded in accordance with ANSI/ASTM C136; to the following limits:

- 1. Minimum Size: 1/4 inch
- 2. Maximum Size: 5/8 inch

- D. Fine Aggregate Type A4 (Sand): Natural river or bank sand; washed,

free of silt, clay, loam, friable or soluble materials, and organic matter, graded in accordance with ANSI/ASTM C136; within the following limits:

Sieve Size	Percent Passing
No. 4	100
No. 14	50 to 85
No. 50	10 to 30
No. 100	2 to 10
No. 200	0

2.02 SOURCE QUALITY CONTROL

- A. Tests and analysis of aggregate materials will be performed in accordance with ANSI/ASTM D698.
- B. If tests indicate materials do not meet specified requirements, change material and re-test.

PART 3 - PREPARATION

3.01 STOCKPILING

- A. Stockpile materials in sufficient quantities to meet construction schedules and requirements.
- B. Separate differing materials with dividers or stockpile apart to prevent mixing.
- C. Direct surface water away from stockpile site so as to prevent erosion.

PART 4 - EXECUTION

4.01 AGGREGATE BASE COURSE

- A. Coarse Aggregate Fill Type A: As specified in 2.01.
- B. Fine Aggregate (Sand) Fill Type A4: As specified in 2.01.

4.02 EXAMINATION

- A. Verify substrate has been inspected, gradients and elevations are correct, and dry.

4.03 AGGREGATE PLACEMENT

- A. Spread aggregate over prepared substrate to an equivalent compacted thickness as shown on the plans.
- B. Place aggregate in maximum 6 inch layers and roller compact.
- C. Level and contour aggregate surfaces to elevations and gradients indicated on the approved plans.
- D. Add small quantities of fine aggregate to course aggregate as appropriate to assist compaction.
- E. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
- F. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

4.04 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straightedge. Positive drainage must be maintained, no ponding or depressed areas, sharp transitions, or other objectionable areas will be allowed.
- B. Compacted thickness for each asphaltic concrete course: Within 1/8 inch, tolerance is not cumulative. Maximum deviation for total asphaltic concrete thickness: Within 1/4 inch regardless of number of courses. Positive drainage must be maintained, no ponding or depressed areas, sharp transitions, or other objectionable areas will be allowed.
- C. Variation from true elevation: Within 1/4 inch. Positive drainage must be maintained, no ponding or depressed areas, sharp transitions, or other objectionable areas will be allowed.

4.05 FIELD QUALITY CONTROL

- A. Compaction testing, locations, number and frequency of tests shall be as recommended by the GE. Compaction testing shall be in accordance with ANSI/ASTM D1556.

- B. If tests indicate Work does not meet specified requirements, remove Work, replace, and re-test.

4.06 COMPACTION

- A. Under paved areas:
 - 1. Compact placed aggregate materials to achieve minimum 95 percent ASTM D698 compaction or as shown on plans.

4.07 ASPHALTIC CONCRETE PAVING

A. RELATED DOCUMENTS / SECTIONS

- 1. Refer to related sections as applicable.
- 2. Aggregate Base Course and Aggregate Materials.

B. REFERENCES

- 1. MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot Mix Types - The Asphalt Institute (AI).
- 2. MS-3 - Asphalt Plant Manual - The Asphalt Institute (AI).
- 3. MS-8 - Asphalt Paving Manual - The Asphalt Institute (AI).
- 4. MS-17 - Asphalt Overlays for Highway and Street Rehabilitation - The Asphalt Institute (AI).
- 5. MS-19 Basic Asphalt Emulsion Manual, The Asphalt Institute (AI).
- 6. ASTM D946 - Penetration-Graded Asphalt Cement for Use in Pavement Construction.

C. PAYMENT ISSUE

- 1. Materials testing to be done at the contractor's expense.
Testing firm to be approved by Architect/Engineer/engineer.

D. QUALITY ASSURANCE

- 1. Perform Work in accordance with AI Manual MS-8 unless the GA DOT specifications conflict.

2. Mixing Plant: Conform to AI Manual MS-3.
3. Obtain materials from same source throughout.

E. SUBMITTALS

1. Material Certificates: Provide copies of materials certificates signed by material producer and Contractor, certifying that each material item complies with or exceeds, specified requirements.

F. SITE CONDITIONS

1. Weather Limitations: Apply prime and tack coats when ambient temperature is above 50 deg. F (10 deg.C), and when temperature has not been below 35 deg. F (1 deg. C) for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture. Construct asphalt concrete surface course when atmospheric temperature is above 40 deg. F (4 deg.C), and when base is dry. Base course may be placed when air temperature is above 30 deg. F (-1 deg. C) and rising.
2. Grade Control: Establish and maintain required lines and elevations.

G. DEFINITIONS

1. Asphalt Wearing Course: The top course of an asphalt pavement.
2. Asphalt Binder Course: The course located between a base course and the wearing course.
3. Base Course: The layer of material immediately beneath the binder course.

H. MATERIALS

1. Asphalt Cement: ASTM D946. Mix must include agent(s) or admixtures per current GDOT specifications for reduction of aggregate acidity.
2. Aggregate for Binder Course Mix: (Heavy Duty asphaltic concrete type B) (Light Duty asphaltic concrete type B) in accordance with GA. DOT standards.

3. Aggregate for Wearing Course Mix: In accordance with GA DOT standards.
4. Aggregate for Base Course: The base course shall be spread evenly upon the prepared subgrade in sufficient quantity to form a compacted depth as shown on the plans.
5. New topping for existing asphalt pavement as shown on the plans.
6. Fine Aggregate: In accordance with the GA DOT standards.
7. Mineral Filler: Finely ground particles of limestone, hydrated lime or other mineral dust, free of foreign matter.

I. ACCESSORIES

1. Primer: In accordance with the GA DOT standards.
2. Tack Coat: In accordance with the GA DOT standards.

J. ASPHALT PAVING MIX

1. Use dry material to avoid foaming. Mix uniformly.
2. Binder Course: Per GA DOT specifications.
3. Wearing Course: Per GA DOT specifications.
4. The contractor shall submit to the Engineer a design mix for each course specified a minimum of two weeks prior to commencing work.

K. SUBBASE

1. Aggregate Base Course forms the base construction for work of this Section.

L. PREPARATION - PRIMER

1. Apply primer on base or subbase over subgrade surface at

- uniform rate of 1/3 gal/sq yd.
- 2. Apply primer to contact surfaces of curbs, gutters.
- 3. Use clean sand to blot excess primer.

M. PREPARATION - TACK COAT

- 1. Apply tack coat on asphalt or concrete surfaces over subgrade at uniform rate of 1/3 gal/sq yd.
- 2. Apply tack coat to contact surfaces of curbs and gutters.

N. PLACING ASPHALT PAVEMENT

- 1. Install Work in accordance with GA DOT standards and specifications.
- 2. All areas where new asphalt adjoins existing asphalt or other pavement shall be sawcut for smooth edges and shall have expansion joints for entire adjoining length. All such expansion joints shall be completely and permanently sealed for entire length per standard details and GADOT standards and specifications. All such areas in right-of-way or other jurisdiction shall comply with the local authority specifications for material, depth, base, pavement thickness, finish, and specifications.

O. RESURFACING

- 1. Resurfacing and/or overlay topping of existing pavements shall be a minimum 1 1/2" type F asphalt surface course. Spot repairs, cleaning, and sealing of existing pavements shall be in accordance with "Asphalt Overlays for Highway and Street Rehabilitation" (MS-17), Asphalt Institute.

P. FIELD QUALITY CONTROL

- 1. General: Core Test in-place asphalt concrete courses for compliance with requirements for thickness and surface smoothness. Test locations shall be selected by Owner/Engineer. Coring(s) shall be repaired per referenced standards. Repair or remove and replace unacceptable paving as directed by Architect/Engineer.
- 2. Thickness: In-place compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:

- A. Base Course: 1/4 inch

- B. Asphaltic concrete Binder and Surface Courses: 1/8 inch
- C. Surface Smoothness: Test finished surface of each asphalt concrete course for smoothness, using 10' straightedge applied parallel with, and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness. All surfaces not acceptable shall be removed and replaced until acceptable.
 - 1. Base Course Surface: 1/4"
 - 2. Compacted thickness for each asphaltic concrete course: Within 1/8 inch, tolerance is not cumulative. Maximum deviation for total asphaltic concrete thickness: Within 1/4 inch regardless of number of courses. Positive drainage must be maintained, no ponding or depressed areas, sharp transitions, or other objectionable areas will be allowed.
 - 3. Crowned Surfaces: Test with crowned template centered at right angle to crown. Maximum allowable variance from template 1/4". Positive drainage must be maintained, no ponding or depressed areas, sharp transitions, or other objectionable areas will be allowed.
 - 4. Check surface areas at intervals as directed by Architect/Engineer/Engineer as necessary to insure conformance to the plans and specifications.

4.08 ASPHALTIC CONCRETE OVERLAY PAVING

A. RELATED DOCUMENTS / SECTIONS

- 1. Refer to related sections as applicable.
- 2. Aggregate Base Course and Aggregate Materials.

B. REFERENCES

- 1. MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot Mix Types - The Asphalt Institute (AI).
- 2. MS-3 - Asphalt Plant Manual - The Asphalt Institute (AI).
- 3. MS-8 - Asphalt Paving Manual - The Asphalt Institute (AI).
- 4. MS-17 - Asphalt Overlays for Highway and Street Rehabilitation - The Asphalt Institute (AI).

5. MS-19 Basic Asphalt Emulsion Manual, The Asphalt Institute (AI).
6. ASTM D946 - Penetration-Graded Asphalt Cement for Use in Pavement Construction.

When standards or specifications are indicated herein by reference, the referenced portion shall apply to the most recent edition of the publication and shall have the same force and effect as if they were included herein in their entirety.

C. PAYMENT ISSUE

1. Materials testing to be done at the contractor's expense. Testing firm to be approved by architect/engineer.

D. QUALITY ASSURANCE

1. Perform Work in accordance with AI Manual MS-8 and the GA DOT specifications. Where conflicts occur, use the more stringent specification.
2. Mixing Plant: Conform to AI Manual MS-3.
3. Obtain materials from same source throughout.

E. SUBMITTALS

1. Material Certificates: Provide copies of materials certificates signed by material producer and Contractor, certifying that each material item complies with or exceeds, specified requirements.

F. SITE CONDITIONS

1. Weather Limitations: Apply prime, seal, and tack coats per manufacturer's specifications, but not less than the following: when ambient temperature is above 50 deg. F (10 deg.C), and when temperature has not been below 35 deg. F (1 deg. C) for 12 hours immediately prior to application. Do not apply when base is wet or contains an excess of moisture. Construct asphalt concrete surface course when atmospheric temperature is above 40 deg. F (4 deg.C), and when base is dry. Base course may be placed when air temperature is above 30 deg. F (-1 deg. C) and rising.
2. Grade Control: Establish and maintain required lines and elevations.

G. DEFINITIONS

1. Asphalt Wearing Course: The top course of an asphalt pavement.
2. Asphalt Binder Course: The course located between a base course and the wearing course.
3. Base Course: The layer of material immediately beneath the binder course.
4. Asphalt Overlay Course: Asphaltic concrete course directly on top of existing asphalt pavement top course. Asphalt overlay is allowed only where specifically shown on plans.

H. MATERIALS

1. Asphalt Cement: ASTM D946.
2. Aggregate for Binder Course Mix: In accordance with GA DOT standards.
3. Aggregate for Wearing Course Mix: In accordance with GA DOT standards.
4. Aggregate for Base Course: The base course shall be spread evenly upon the prepared subgrade in sufficient quantity to form a compacted depth as shown on the plans.
5. Overlay for existing asphalt pavement only as shown and specified on the plans.
6. Fine Aggregate: In accordance with the GA DOT standards.
7. Mineral Filler: Finely ground particles of limestone, hydrated lime or other mineral dust, free of foreign matter.

I. ACCESSORIES

1. Primer: In accordance with the GA DOT standards.
2. Tack Coat: In accordance with the GA DOT standards.

J. ASPHALT PAVING MIX

1. Use dry material to avoid foaming. Mix uniformly.
2. Binder Course: Per GA DOT specifications.

3. Wearing Course: Per GA DOT specifications.
4. Overlay Course: Per GA DOT specifications.
5. The contractor shall submit to the Engineer a design mix for each course specified a minimum of two weeks prior to commencing work.

K. ASPHALT OVERLAY PREPARATION - EXISTING PAVEMENT

1. The Contractor must perform a thorough inspection of all existing pavement areas designated for asphalt pavement overlay with the Architect/Engineer. Existing pavement areas which exhibit excessive wear, rutting, cracking, settling, or other defects must be repaired prior to installation of asphalt overlay. Repaired areas must meet project specifications for the entire pavement section including subgrade, base, and all asphalt pavement courses. Areas requiring repairs shall be determined by the Architect/Engineer.
2. CLEANING:
Existing asphalt pavement shall be cleaned thoroughly. Saw cut pavement edges where pavement is to be removed. Clean all loose and objectionable material. Surface must be dry prior to asphalt overlay pavement. Primer, sealer, reinforcement fabric, and tack coat are required prior to placement of overlay pavement.
3. STRUCTURAL PATCHING:
Structural patching will be required where the following conditions occur: excessive wear of surface course, rutting, excessive cracking, local depressed areas, potholes, and similar defects in the existing pavement. All such areas in the existing pavement with defects shall be removed and repaired. Areas to be patched shall be cut out, trimmed to vertical sides, with all loose material or debris removed. Remove and replace subgrade and existing aggregate base material as required to provide a minimum pavement section equal to or greater than the pavement section specified for the project.
4. LEVELING:
Leveling consists of asphalt wedges used to level existing pavement surfaces prior to asphalt overlay pavement installation. Leveling may be done ONLY in those areas where the existing base course and underlying subgrade meet the minimum pavement specifications for the project as determined by the Architect/Engineer. Leveling shall be done in at least two layers, maximum depth of 2 inches per layer, for up to 6 inches total depth. All layers shall be level with smooth transitions to existing pavement. Crowned areas shall be leveled all the way

to the top of the crown, depressed areas shall be leveled to meet the existing edge of pavement adjacent to the depression. Leveling construction and materials shall conform to GA DOT specifications.

5. CRACK SEALING:

All cracks in the existing pavement greater than 0.375 inches (3/8") shall be sealed with an appropriate crack filler prior to asphalt overlay pavement installation. After proper installation of crack filler material, all cracks in existing pavement shall be reinforced with Type II pavement reinforcement fabric per GA DOT standards and specifications. Crack filler and sealer material and construction shall conform to GA DOT specifications.

6. TAPERING:

Asphalt pavement overlay adjacent to curbs, gutters, raised pavement edges, structures, drainage grates, manhole covers, or similar areas shall be constructed to provide a finished asphalt surface at the joint where the asphalt meets the existing structure no higher or lower than the existing or proposed structure elevation to provide a smooth even surface at all structures in or adjacent to the pavement. The asphalt overlay minimum thickness as specified shall be maintained. Existing pavement shall be removed as required to provide a finished surface at the edge of pavement adjacent to existing or proposed structures equal to the existing structure surface elevation. Do not feather or taper the asphalt overlay. Maintain the minimum pavement thickness throughout.

7. STRUCTURE ADJUSTMENTS:

All structures in the pavement or touching pavement shall be adjusted, relocated, repaired, raised or lowered, and set into new pavement to ensure proper function for the structure. All joints and edges with existing pavement, curb, gutters, drainage structures, manholes, cleanouts, valves, and all other structures in the pavement overlay area, shall be even with the finished pavement surface including the overlay and uniform for the proper function of the structure. Removal of existing asphalt pavement will be required. Do not raise with the asphalt overlay any finished grades adjacent to buildings or structures which may be damaged by water intrusion. Maximum finished pavement grade adjacent to buildings or structures which may be damaged by water intrusion is 0.50 feet lower than the finished floor level of the building or structure. Existing grades adjacent to buildings which are less than 0.50 feet lower than the finished floor may be maintained at the existing elevation with Owner's approval under the following conditions: 1.) no water intrusion is present, with no history of water intrusion

(Contractor must verify); 2.) Positive slope and drainage away from the building or structure must be maintained.

L. ASPHALT OVERLAY PREPARATION - PRIMER

1. Apply primer on base or subbase over surface at uniform rate per GA DOT specifications.
2. Apply primer to contact surfaces of curbs, gutters.
3. Use clean sand to blot excess primer.

M. ASPHALT OVERLAY PREPARATION - TACK COAT

1. Apply tack coat on asphalt or concrete surfaces over subgrade at uniform rate per GA DOT specifications.
2. Apply tack coat to contact surfaces of curbs and gutters. Install Type II pavement reinforcement fabric per GA DOT standards and specifications.

N. PLACING ASPHALT OVERLAY PAVEMENT

1. Install all Work in accordance with asphaltic concrete pavement specifications, and GA DOT standards and specifications.

O. RESERVED

P. FIELD QUALITY CONTROL

1. General: Test in-place asphalt concrete courses for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable paving as directed by Architect.
2. Thickness: In-place compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:
 - A. Base Course: 1/2", plus or minus
 - B. Surface Course: 1/4", plus or minus
 - C. Overlay Course: 1/4", plus or minus
 - D. Surface Smoothness: Test finished surface of each asphalt concrete course for smoothness, using 10' straightedge applied parallel with, and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness. All surfaces not acceptable shall be removed and replaced until acceptable.

1. Base Course Surface: 1/4"
2. Wearing Course Surface: 1/8"
3. Crowned Surfaces: Test with crowned template centered at right angle to crown. Maximum allowable variance from template, 1/4".
4. Check surface areas at intervals as directed by Architect or as necessary to insure conformance to the plans and specifications.

END OF SECTION 02230

SECTION 02510 - PORTLAND CEMENT CONCRETE PAVING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Concrete Curbs
- B. Concrete Sidewalks, pads & steps
- C. Concrete Paving, footings, foundations, slabs

1.02 RELATED SECTIONS

- A. Refer to appropriate related sections as applicable

1.03 REFERENCES

- A. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
- B. ACI 305R - Hot Weather Concreting.
- C. ACI 306R - Cold Weather Concreting.
- D. ACI 308 - Standard Practice for Curing Concrete.
- E. ACI 318 - Building Code Requirements for Reinforced Concrete.
- F. ANSI/ASTM D994 - Preformed Expansion Joint Filler for Concrete (Bituminous Type).
- G. ANSI/ASTM D1190 - Concrete Joint Sealer, Hot-Poured Elastic Type.
- H. ANSI/ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
- I. ASTM C33 - Concrete Aggregates.
- J. ASTM C94 - Ready-Mixed Concrete.
- K. ASTM C150 - Portland Cement.
- L. ASTM-C260 - Air Entraining Admixtures for Concrete.
- M. ASTM C494 - Chemicals Admixtures for Concrete.
- N. ACI 301 - Specifications for Structural Concrete

When standards or specifications are indicated herein by reference, the referenced portion shall apply to the most recent edition of the publication and shall have the same force and effect as if they were included herein in their entirety.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301.
- B. Maintain one copy of each document on site.
- C. Acquire cement and aggregate from same source for all work.
- D. Conform to ACI 305R when concreting during hot weather.
- E. Conform to ACI 306R when concreting during cold weather.

1.06 DESCRIPTION OF WORK

- A. When any construction, materials, or specifications for the same or similar item(s) are shown in more than one place in the construction documents, plans, or specifications, the more stringent requirement shall apply as determined by the Engineer.

PART 2 - PRODUCTS

2.01 CONCRETE TYPES

- A. Class A and B Concrete.

2.02 MATERIAL

A.	CLASS A	CLASS B
Coarse Aggregate Size No.	56, 57, 67	56, 57, 67
Minimum Cement Factor (lbs / cu yd)	611	470
Maximum Water / Cement Ratio (lbs / cu yd)	0.490	0.660
Slump Acceptance Limits (in. lower - upper)	2 - 4	2 - 4
Entrained Air Acceptance Limits (% lower - upper)	2.5 - 6.0	0.0 - 6.0
	CLASS A	CLASS B
Minimum Compressive Strength 28 Days (psi)	3000	2500

- B. Refer to GA DOT standards and specifications.
- C. Minimum compressive strength shall be as stated on plans.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type I - Normal.
- B. Fine and Coarse Aggregate : ASTM C33.
- C. Water: Clean and not detrimental to concrete.

2.04 CONCRETE MIX

- A. Mix concrete in accordance with ACI 304. Deliver concrete in accordance with ASTM C94.
- B. Select proportions for normal weight concrete in accordance with ACI 301 Method 1.
- C. No mixing onsite will be allowed, no fly ash or other additives will be allowed, water shall not be added after initial mixing at plant. Concrete older than 90 minutes from initial mixing at plant shall not be used.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify all formwork is correctly installed and located.
- B. Verify requirements for concrete cover over reinforcement.

3.02 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.

3.03 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304. Fully comply with ACI 305R (Hot weather concreting) and ACI 306R (Cold weather concreting).
- B. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints are not disturbed during concrete placement.
- C. Install joint devices in accordance with manufacturer's instructions.

- D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- E. Place concrete continuously between predetermined expansion, control, and construction joints.

3.04 RESERVED

3.05 CONCRETE FINISHING

- A. Broom finish surfaces which are scheduled to be exposed or as directed by the Architect or shown on the plans. Verify required finish with Architect and Owner prior to construction.

3.06 CURBING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

3.07 FIELD QUALITY CONTROL

- A. Field testing will be performed in accordance with ACI 301.

3.08 PATCHING

- A. Allow Architect/Engineer to inspect concrete surfaces immediately upon removal of forms.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Architect/Engineer upon discovery.

3.09 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replacement of defective concrete will be determined by the Architect/Engineer.
- C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect/Engineer for each individual area.

3.10 SIDEWALKS

- A. Walks shall be constructed of Class B concrete, and shall be minimum four (4") inches depth. Provide cross slope (perpendicular to travel path) of minimum 1/8 inch per foot (1.0%) to maximum 1/4 inch per foot (2.0%). Cross slope shall direct flow to drainage channels, storm sewer, or free discharge. No ponding allowed. All sidewalks shall have minimum 6x6 10 Gauge welded wire fabric reinforcement placed at 1.5 inches from bottom of concrete, with subgrade compacted to minimum 95 percent maximum dry density. Transverse contraction joints shall be formed with tool designed for forming groove one-third of the depth of the sidewalk, and located as shown on the architectural drawings, or at a minimum of twice the sidewalk width, or 10 feet maximum. All edges shall be rounded with a 1-1/4" edger. Full depth expansion joints shall be located on not more than 20'-0" centers and at all intersections. All sidewalk surfaces should be broom finished or as directed by Architect/Engineer or as shown on plans. Verify finish prior to construction.

3.11 CURBS

- A. Curbs shall be constructed of Class A concrete and all curbing shall be placed in compacted subsoil meeting specifications. Curbing shall be as shown on plans. Transverse contraction joints shall be formed with tool designed for forming groove, and on no more than 6'-0" centers. Expansion joints shall be located on not more than 20'-0" centers and at all intersections.
- B. Gutter cross section slope shall be adjusted at low points and as required to meet design intent for drainage and flow direction. At upstream low point sections the gutter cross slope shall be sloped in the direction of flow and blended smooth with adjacent curb and gutter. No ponding will be allowed in any gutter section.

3.12 CONCRETE PADS & STEPS

- A. Shall be constructed of Class A concrete. Concrete reinforcement according to construction details, minimum 6x6 10 gauge welded wire fabric. All concrete pads poured at entrance or exit doorways or access points shall be poured to the finish floor level at the interface with the building, and immediately sloping away from the building at a rate of 1/8 inch per foot or 1.0 percent minimum, 1/4 inch per foot maximum. Provide positive slope away from building or structure at all points, no ponding or depressed areas will be allowed.

3.13 CONCRETE PAVING

Shall be placed in full compliance with ACI Hot and Cold weather requirements. Concrete reinforcement according to construction details, minimum 6x6 10 gauge welded wire fabric.

Install dowels at all connections to existing concrete, paving, curb and gutter, or any other existing concrete. Install dowels at all connections to existing concrete, paving, curb and gutter, or any other existing concrete. Install dowels at all construction joints. Dowels shall be as shown on the plan details, installation and materials per GDOT standards and specifications as a minimum.

Install control joints at maximum 10' x 10' spacing. Install construction joints at pour terminations or other placement interruptions. All construction joints shall coincide with control joint(s).

Submit joint layout and details for approval prior to construction.

END OF SECTION 02510

SECTION 02580 - PAVEMENT MARKING AND TRAFFIC SIGNS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Parking striping and direction markings on asphalt concrete.
- B. Signage for directing traffic on the site.

1.02 SUBMITTALS

- A. Product data: Submit for marking paint to Architect. Indicate application rates and methods.
- B. Proposed Sign Samples to Owner/Architect.

1.03 REFERENCES

- A. Georgia Department of Transportation Standards and Specifications
- B. Manual on Uniform Traffic Control Devices (MUTCD)

When standards or specifications are indicated herein by reference, the referenced portion shall apply to the most recent edition of the publication and shall have the same force and effect as if they were included herein in their entirety.

1.04 JOB CONDITIONS

- A. Weather Limitations:
 - 1. Apply pavement marking paint only when ambient temperature in the shade is at least 50 degrees F for 12 hours immediately prior to application.
 - 2. Do not apply when surface is wet or contains moisture.
 - 3. Do not apply paint when wind conditions would result in debris being deposited on painted surfaces.

1.05 DESCRIPTION OF WORK

- A. When any construction, materials, or specifications for the same or similar item(s) are shown in more than one place in the construction documents, plans, or specifications, the more stringent requirement shall apply as determined by the Engineer.

PART 2 - PRODUCTS

2.01 PAVEMENT MARKING PAINT

- A. Traffic lane, parking stall, handicap parking and direction arrow marking: Type meeting GA DOT Specification, current edition.
- B. Qualities: Quick drying colors as specified by Architect.
- C. Source:
 - 1. Sherglide by Sherwin-Williams or equivalent.

2.02 DIRECTIONAL SIGNAGE

- A. All signage used on the site to direct traffic shall conform to the Manual for Uniform Traffic Control Devices, and the GA. D.O.T. Standards and Specifications, current edition, and be approved by the Owner/Architect prior to installation. Contractor shall provide Owner/Architect with samples and shop drawings of these signs.

2.03 HANDICAP PARKING SIGNS

- A. Contractor shall provide and erect all required handicap signage required for the site according to federal, state, county and city authorities standards and specifications whether shown on the plans or not.

PART 3 - EXECUTION

3.01 MARKING PAVEMENTS

- A. All pavement markings used on the site to direct traffic shall conform to the Manual for Uniform Traffic Control Devices, and the GA. D.O.T. Standards and Specifications, current edition, as approved by the Owner/Architect. Contractor shall provide Owner/Architect with samples and shop drawings of all markings prior to construction, Paint lines as shown on approved drawings.
- B. Cleaning: Sweep surface with power broom supplemented by hand brooms to remove loose material and dirt. Do not begin pavement marking until substrate has cured.
- C. Apply paint with mechanical equipment to uniform straight line. All linework not otherwise indicated shall be 4" uniform thickness, color white. All directional markings shall be painted with spray equipment on stencils or templates of approved design to prevent overspray. Apply one coat in accordance with manufacturer's recommended rates to achieve minimum 15 mils dry film thickness.

END OF SECTION 02580

SECTION 02700 - STORM SEWER

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Site storm sewer drainage piping, structures, fittings, accessories, and pipe bedding.
- B. Catch basins, manholes at junctions, inlets, structures and appurtenances as shown on the plans.

1.02 RELATED DOCUMENTS/SECTIONS

- A. Contract documents and drawings, construction details as shown on the plans, geotechnical engineering report, GA. D.O.T. Standards and Specifications. Refer to appropriate related sections as applicable.

1.03 REFERENCED STANDARDS

- A. AASHTO M36 - Metallic (Zinc or Aluminum) Coated Corrugated Steel Culverts and Underdrains.
- B. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.
- C. ANSI/ASTM A74 - Cast Iron Soil Pipe and Fittings.
- D. ANSI/ASTM C12 - Practice for Installing Vitrified Clay Pipe Lines.
- E. ANSI/ASTM C14 - Concrete Sewer, Storm Drain, and Culvert Pipe.
- F. ANSI/ASTM C76 - Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
- G. ANSI/ASTM C425 - Compression Joints for Vitrified Clay Pipe and Fittings.
- H. ANSI/ASTM C443 - Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
- I. ASTM C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings.

- J. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
- K. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb(4.54 Kg) Rammer and 18 inch (457 mm) Drop.
- L. ANSI/ASTM D2321 - Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
- M. ANSI/ASTM D2729 - Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- N. ANSI/ASTM D2751 - Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
- O. ANSI/ASTM D3033 - Type PSP Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- P. ANSI/ASTM D3034 - Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- Q. ASTM C700 - Vitrified Clay Pipe, Extra Strength, Standard Strength and Perforated.
- R. ASTM D2922 - Test Methods for Density of Soil and Soil- Aggregate in Place by Nuclear Methods (Shallow Depth).
- S. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

When standards or specifications are indicated herein by reference, the referenced portion shall apply to the most recent edition of the publication and shall have the same force and effect as if they were included herein in their entirety.

1.04 DEFINITIONS

- A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations. All bedding and trenching shall conform to the details shown on the construction plans. Any wet, spongy, or other unsuitable material shall be removed and/or

stabilized at the direction of the soils engineer.

1.05 SUBMITTALS

- A. Provide data indicating pipe, pipe accessories, and manufacturer's warranties.
- B. Manufacturer's Installation Instructions: Indicate special procedures required to install products specified.
- C. Manufacturer's Certificate: Certify that products meet or exceed specifications and/or referenced standards.
- D. Pre-manufactured catch basins, trench drains or other special drainage equipment: Submit to Engineer manufacturer's shop drawings, specifications, and warranties for approval prior to purchase or installation.

1.06 PROJECT RECORD DOCUMENTS

- A. Submit complete, detailed as built drawings to Owner, Engineer, and Architect upon completion of the work showing vertical and horizontal location. As built drawings shall be based on field run survey(s) and be sealed and signed by a registered surveyor in the State where the project is located. Provide three sets of original hard copies and one digital file in AutoCad or other acceptable digital format. Contractor is responsible for approval and verification of acceptable digital format. **As-built drawings will be required at a minimum 45 days prior to substantial completion.**
- B. Accurately record actual locations of pipe runs, taps, connections, valves, tees, mechanical joints, connections, pipes, manholes, structures, sub-surface drain fields, septic tanks, lift stations, service taps or stubouts, type and size of material, and top and invert elevations of all pipes and structures.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities or other structures. All such uncharted utilities or structures shall be shown on as built drawings.

1.07 REGULATORY REQUIREMENTS

- A. Conform to all applicable Federal, State, County, City, or local

jurisdiction requirements concerning storm sewer construction and safety.

- B. **WARNING:**
CONTRACTOR SHALL: COMPLY WITH ALL OSHA, FEDERAL, STATE, LOCAL, AND INDUSTRY STANDARD SAFETY MEASURES, DEVICES, PROCEDURES, PRECAUTIONS, AND EQUIPMENT FOR ALL WORK OR OTHER ACTIVITIE(S). NO PERSON(S) SHALL ENTER MANHOLES, CONFINED SPACES, OR OTHER UNDERGROUND STRUCTURES, SPACES, TRENCHES, OR EXCAVATIONS WITHOUT PROTECTIVE BREATHING APPARATUS AND ALL OTHER REQUIRED SAFETY MEASURES, DEVICES, PROCEDURES, AND EQUIPMENT, AND AT LEAST ONE OTHER PERSON PRESENT ABOVE GROUND FOR SAFETY AND MONITORING AT ALL TIMES. CONTRACTOR SHALL PROVIDE AND ENSURE USE OF SAFETY KITS, HELMETS, GLOVES, EMERGENCY OXYGEN RESUSCITAOR KITS, AND AIR QUALITY AND GAS DETECTORS FOR VOLATILE, TOXIC, OR EXPLOSIVE GASES OR SUBSTANCES. VERIFY SAFE OXYGEN CONTENT PRIOR TO ENTERING MANHOLES, CONFINED SPACES, OR OTHER UNDERGROUND STRUCTURES.

1.08 FIELD MEASUREMENTS

- A. Verify that field measurements and elevations are as indicated by the manufacturer.

1.09 COORDINATION

- A. A. Coordinate the Work with plumbing contractor and MEP engineering plans for connection of storm sewer to foundation drainage system and roof drainage system outside building. Verify and confirm positive drainage and slope for all Roof drain stubs connection to storm sewer prior to construction (PTC).

1.10 DESCRIPTION OF WORK

- A. When any construction, materials, or specifications for the same or similar item(s) are shown in more than one place in the construction documents, plans, or specifications, the more stringent requirement shall apply as determined by the Engineer.

PART 2 - PRODUCTS

2.01 STORM SEWER PIPE MATERIALS

- A. All storm sewer structures, manholes, junctions, piping, joints, sealing, materials and installation shall conform, at a minimum, to the local authorities having jurisdiction standards and specifications and current Georgia Department of Transportation (GDOT) latest standards and specifications, and as specified herein, whichever is greater. The Contractor is responsible for verification of current applicable standards and specifications prior to construction. All manhole or other junction structures shall have with paved invert channels per current GDOT standards and specifications.
- B. Storm Sewer Pipe:
All storm sewer pipe gauge shall conform at minimum to GDOT 1030D, 1030P, current revision, and pipe manufacturer's specifications, whichever is greater. All storm sewer pipe, materials, joints, and installation is subject to the approval of the local authority having jurisdiction approval. Contractor shall verify local authority specifications and requirements prior to purchase. All storm sewer (except concrete) carrying live streams or used for storm water detention shall have paved invert.
- C. Reinforced Concrete Pipe: ANSI/ASTM C76, Class III, with Wall Type A, mesh reinforcement; bell and spigot end joints. Verify Class per GADOT 1030D.
- D. Reinforced Concrete Pipe Joint Device: ANSI/ASTM C443, rubber compression gasket joint.
- E. Corrugated Steel Pipe: AASHTO M36 Type I, helical lock seam, coated inside and out with 0.050 inch (1.3 mm) thick bituminous coating.
- F. Coupling Bands: Galvanized steel, 0.052 inches (1.3 mm) thick x 10 (250 mm) inches wide; connected with two neoprene "O" ring gaskets and two galvanized steel bolts.
- G. HDPE Pipe:
Shall conform to: ASTM D4101, ASTM F677, ASTM D3212, ASTM F477, ASTM D2321, AASHTO M294.
Contractor shall comply fully with all manufacturer's specifications and

as specified herein, whichever is greater, including but not limited to: subgrade, bedding, joints, backfill, installation and handling procedures.

Minimum HDPE requirements:

Smooth bore dual wall pipe is minimum requirement.

All HDPE pipe installation shall be monitored and certified by Geotechnical Engineer or other testing agency approved by Engineer / Architect.

Provide submittal to Engineer for approval prior to purchase.

Maintain minimum HS20 load rating at all times.

Watertight bell and spigot gasketed joints required.

Granular backfill conforming to ASTM D2321 Class I (AASHTO M43 Designation #5 or # 56 stone) shall be installed minimum 6 inches below pipe to 12" over top of pipe, minimum compaction 90% ASTM D698, or per manufacturer, or as shown on plans, whichever is greater. Contractor shall verify all bedding requirements prior to construction.

Backfill shall be distributed and placed with shovels or other light hand tools to completely fill all voids in and around the pipe and the backfill area at the required density for compaction specified. No heavy equipment shall be used adjacent to or near the pipe until minimum cover is established as noted below.

Geotextile fabric shall be installed at the interface between adjacent soil and the granular backfill below, on the sides, and at the top of the backfill trench. Verify type of geotextile with Geotechnical Engineer prior to construction.

Heavy equipment or vehicles are not allowed over HDPE pipe prior to minimum 24 inches compacted cover (or per manufacturer specifications, whichever is greater) over top of pipe is established per design and specifications.

Minimum and maximum cover depth shall be verified by Contractor with manufacturer based on design, site conditions, manufacturer specifications, and contract documents, plans, and specifications.

Contractor shall verify that site soil conditions meet manufacturer's specifications for pH and resistivity prior to purchase.

Contractor shall provide testing and certification of all HDPE pipe installation for deflection and structural integrity after finish grades are established and construction is complete by Geotechnical Engineer or other testing agency approved by Engineer / Architect.

H. Aluminum Coated Type 2 Corrugated Steel Pipe:

Shall conform to: AASHTO M36, AASHTO M274

Contractor shall comply fully with all manufacturer's specifications, including but not limited to: bedding, joints, backfill, and installation

and handling procedures.

Minimum pipe thickness is 12 gauge. Comply GADOT 1030D and manufacturer's specifications for pipe gauge, depths and design conditions.

Provide submittal to Engineer for approval prior to purchase.

Maintain minimum H20 load rating at all times.

Granular backfill of maximum 1 inch diameter to 1/2 pipe diameter required.

Contractor shall verify that site soil conditions meet manufacturer's specifications for pH and resistivity prior to purchase.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that trenches, excavations, dimensions, bedding, fill materials, and elevations conform to the plans and specifications and are ready to receive the work.
- B. Contractor shall verify all existing storm sewer pipe, structures, and other utilities location, depth, invert, material, size, and condition **PRIOR TO CONSTRUCTION**. Contractor shall verify connection locations and inverts to existing storm sewer pipe or structures **PRIOR TO CONSTRUCTION**. Resolve any conflicts or problems prior to proceeding with the work.

3.02 PREPARATION

- A. Hand trim excavations to required elevations. Correct over-excavation with fine aggregate or as directed by the contracting officer. Verify all fill material as suitable with the soils engineer prior to placement and compaction.
- B. Remove large stones, debris, rock, roots, organic material, or other hard matter which could damage piping or impede consistent backfilling or compaction.

3.03 BEDDING

- A. Excavate pipe trench in accordance with Section 02200 for work of this section. Hand trim excavation for accurate placement of pipe to elevations indicated. Cut trenches sufficiently wide to enable

installation and inspection. The minimum bedding for all pipes is Class B unless specified otherwise.

- B. Pipe bedding is required for all storm sewer. Where not specified on the plans, Class B Bedding will be required. Do not place aggregate or stone bedding for any storm sewer or storm structure in or within 20 linear feet of any dam, pond, or water impoundment area. Place bedding material at trench bottom, level materials in continuous layers not exceeding 6 inches compacted depth. Minimum compaction for pipe trenches is 95% of standard proctor or greater as directed by the soils engineer.
- C. Maintain optimum moisture content of bedding material to attain required compaction density.

3.04 INSTALLATION - STORM SEWER

- A. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. Seal joints watertight.
- B. Lay pipe to slope gradients noted on drawings.
- C. Install pipe bedding aggregate at bottom, sides and over top of pipe where required and as shown on the drawings. Do not place aggregate or stone bedding for any storm sewer or storm structure in or within 20 linear feet of any dam, pond, or water impoundment area. Provide top cover to minimum compacted thickness of 12 inches, compact to minimum 95% standard proctor.
- D. Refer to Section 02200 for trenching requirements. Do not displace or damage pipe when compacting.
- E. Refer to Section 02200 for field testing requirements for fill materials.

3.05 INSTALLATION – MANHOLES, JUNCTIONS, STRUCTURES

- A. All manholes, junctions, or structures shall be precast reinforced concrete. Brick structures will not be allowed. Set all structures plumb. All structures shall have inverts to provide positive flow and prevent any ponding of water. Install per manufacturer's specifications.
- B. All grout shall be nonmetallic, non-shrink cementitious type flowable expansive grout with minimum 28 day compressive strength of 6500 psi, conforming to ASTM C 1107, verify Type for field conditions prior

to construction. Voids or gaps which exceed the maximum allowed for grout by the manufacturer specifications will require a structural repair or replacement as directed by the Engineer. Comply fully with grout manufacturer's specifications.

- C. Manhole, junction, or structure riser sections shall be watertight and sealed per manufacturer's specifications and reference standards using preformed resilient gaskets. Joints between manholes or structures and base sections shall be grouted on the inside to provide a smooth surface. Manhole sections shall grouted to ring and covers on the inside.
- D. All pipe or other penetrations into manholes, structures, or junctions shall be permanently sealed watertight. Fill all spaces between pipe or other connections and manholes, junctions, or structures completely with non-shrink cementitious concrete grout placed on inside and outside of manhole or structure, completely filling all voids. The exterior wall of the manhole or structure shall have a minimum 6 inch thick 2500 psi concrete collar poured tightly around the entire pipe perimeter and tight to the exterior wall, minimum extension past the pipe shall be 12 inches. Grout shall have minimum 28 day compressive strength of 6500 psi, installed in strict compliance with manufacturer's specifications.

3.06 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 02200.
- B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest, until the work meets specified requirements.
- C. Frequency of Tests: As directed by the soils engineer (GE).

3.07 PROTECTION

- A. Protect finished Work from damage during construction. Damaged work shall be replaced at the expense of the contractor.
- B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.
- C. All storm sewer structures, pipe, connections, and appurtenances shall be thoroughly cleaned and free of silt, sediment, soil, debris, trash, or

any unsuitable materials or obstructions. This is the sole responsibility of the Contractor.

END OF SECTION 02700

SECTION 02713 - WATER SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Pipe and fittings for site water line including domestic water line and ductile iron pipe water line.
- B. Valves, fire hydrants if required, and domestic water hydrants.

1.02 RELATED DOCUMENTS/SECTIONS

- A. Contract documents and drawings, construction details as shown on the plans, geotechnical engineering report. Refer to appropriate related sections as applicable.

1.03 REFERENCE STANDARDS

- A. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.
- B. ANSI/ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
ASME B1.20.1 - Pipe Threads, General Purpose (Inch)
ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings
- C. ANSI/ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
- D. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
- E. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 Kg) Rammer and 18 inch (457 mm) Drop.
- F. ANSI/ASTM D2466 - Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
- G. ANSI/AWS A5.8 - Brazing Filler Metal.
- H. ANSI/AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
- I. ANSI/AWWA C105 - Polyethylene Encasement for Ductile Iron Piping for Water and other liquids.

- J. ANSI/AWWA C111- Rubber-Gasket Joints for Ductile Iron and Grey-Iron Pressure Pipe and Fittings.
- K. ANSI/AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
- K1. ASTM A536 – Ductile Iron MJ Fittings
ASTM A48 - Specification for Gray Iron Castings
ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped Zinc - Coated Welded and Seamless (Replaces A120)
- K2. ANSI/AWWA C110, C153 – Ductile Iron MJ Fittings

AWWA C115 - Standard for Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges

AWWA C116 - Standard for Protective Fusion-Bonded Epoxy Coating for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings for Water Supply Service
- L. ANSI/AWWA C500 - Gate Valves, 3 through 48 in NPS, for Water and Sewage Systems.
- M. ANSI/AWWA C502 - Dry Barrel Fire Hydrants.
- N. ANSI/AWWA C504 - Rubber Seated Butterfly Valves.
- O. ANSI/AWWA C508 - Swing-Check Valves for Waterworks Service, 2 in through 24 in NPS.
- P. ANSI/AWWA C509 - Resilient Seated Gate Valves 3 in through 12 in NPS, for Water and Sewage Systems.

AWWA C512 - Air-Release, Air/Vacuum, and Combination Air Valves for Waterworks Service

AWWA C515 - Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service

AWWA C550 - Protective Epoxy Interior Coating for Valves and Hydrants
- Q. ANSI/AWWA C600 - Installation of Ductile-Iron Water Mains and Appurtenances.

AWWA C605 - Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water

- R. AWWA C651 - Disinfecting Water Mains
ANSI/AWWA C606 - Grooved and Shouldered Type Joints.

AWWA C800 - Underground Service Line Valves and Fittings
- S. ANSI/AWWA C900 - Standard for Polyvinyl Chloride (PVC) Pressure Pipe, 4 inch through 12 inch, for Water.
- T. ASTM B88 - Seamless Copper Water Tube.

Copper Development Association (CDA)

Copper Tube Handbook International Conference of Building Officials (ICBO)
- U. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
- V. ASTM D2241 - Poly (Vinyl Chloride) (PVC) Plastic Pipe(SDR-PR).
- W. ASTM D2855 - Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings.
- X. ASTM D2922 - Test Methods for Density of Soil and Soil- Aggregate in Place by Nuclear Methods (Shallow Depth).
- Y. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.
- Z. ASTM D3139 - Joints for Plastic Pressure Pipes using Flexible Elastomeric Seals.
- AA. ASTM D3035 - Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Controlled Outside Diameter.

ASTM - D2774 Standard Practice for Underground Installation of Thermoplastic Pressure Piping

ASTM F477 - Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- BB. AWWA C901 - Polyethylene (PE) Pressure Pipe, Tubing, and Fittings, 1/2 inch through 3 inch, for Water.
- CC. UL 246 - Hydrants for Fire - Protection Service.

National Fire Protection Association (NFPA) 24 - Standard for the Installation of Private Fire Service Mains and Their Appurtenances

- DD. Local Authority Water and Sewer Department standards and specifications. All materials and construction shall conform, at a minimum, to Local Authority Having Jurisdiction (LAHJ) standards and specifications. Contractor is responsible for verification of LAHJ specifications prior to construction.

When standards or specifications are indicated herein by reference, the referenced portion shall apply to the most recent edition of the publication and shall have the same force and effect as if they were included herein in their entirety.

1.04 SUBMITTALS

- A. Provide data indicating pipe, pipe accessories, and manufacturer's warranties.
- B. Manufacturer's Installation Instructions: Indicate special procedures required to install products specified.
- C. Manufacturer's Certificate: Certify that products meet or exceed specifications and/or referenced standards.

1.05 PROJECT RECORD DOCUMENTS

- A. Submit complete, detailed as built drawings to Owner, Developer, and Architect upon completion of the work showing vertical and horizontal location. As built drawings shall be based on field run survey(s) and be sealed and signed by a registered surveyor in the State where the project is located. Provide three sets of original hard copies and one digital file in AutoCad or other acceptable digital format. Contractor is responsible for approval and verification of acceptable digital format. **As-built drawings will be required at a minimum 45 days prior to substantial completion.**
- B. Accurately record actual locations of pipe runs, taps, connections, valves, tees, mechanical joints, connections, pipes, manholes, structures, sub-surface drain fields, septic tanks, lift stations, service taps or stubouts, type and size of material, and top and invert elevations of all structures.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities or other structures. All such uncharted utilities or structures shall be shown on as built drawings.

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with local utility company providing water service standards and specifications. Contractor shall coordinate with utility concerning inspection, testing and applicable specifications. The minimum requirements of the referenced standards herein shall be maintained in the event of conflicts with the local utility requirements.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.
- C. Follow manufacturer's installation requirements and recommendations.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site in a timely manner to facilitate the construction schedule. Protect materials and equipment from damage due to construction, weather, or other means.
- B. Deliver and store valves in shipping containers with labeling in place.

1.08 DESCRIPTION OF WORK

- A. When any construction, materials, or specifications for the same or similar item(s) are shown in more than one place in the construction documents, plans, or specifications, the more stringent requirement shall apply as determined by the Engineer.
- B. **WARNING:**
CONTRACTOR SHALL: COMPLY WITH ALL OSHA, FEDERAL, STATE, LOCAL, AND INDUSTRY STANDARD SAFETY MEASURES, DEVICES, PROCEDURES, PRECAUTIONS, AND EQUIPMENT FOR ALL WORK OR OTHER ACTIVITIE(S). NO PERSON(S) SHALL ENTER MANHOLES, CONFINED SPACES, OR OTHER UNDERGROUND STRUCTURES, SPACES, TRENCHES, OR EXCAVATIONS WITHOUT PROTECTIVE BREATHING APPARATUS AND ALL OTHER REQUIRED SAFETY MEASURES, DEVICES, PROCEDURES, AND EQUIPMENT, AND AT LEAST ONE OTHER PERSON PRESENT ABOVE GROUND FOR SAFETY AND MONITORING AT ALL TIMES. CONTRACTOR SHALL PROVIDE AND ENSURE USE OF SAFETY KITS, HELMETS, GLOVES, EMERGENCY OXYGEN RESUSCITAOR KITS, AND AIR QUALITY AND GAS DETECTORS FOR VOLATILE, TOXIC, OR EXPLOSIVE GASES OR SUBSTANCES. VERIFY SAFE OXYGEN CONTENT PRIOR TO ENTERING MANHOLES, CONFINED SPACES, OR

OTHER UNDERGROUND STRUCTURES.

PART 2 - PRODUCTS

2.01 WATER PIPE

- A. Lines 4" and larger shall be ductile iron pipe (DIP). All pipes shall be permanently marked to allow identification of type and class and Underwriters Laboratories (UL) listed or Factory Mutual (FM) approved if used for fire protection and shall conform to the following material requirements:

Ductile Iron Pipe (DIP) 4" and larger shall be as noted on the drawings but not less than pressure class 350, conforming to AWWA C151, with rubber-gasket joints conforming to AWWA C111, and cement-mortar lining conforming to AWWA C104. The pipe exterior shall have a bituminous outside coating conforming to AWWA C151.

Flanged Ductile Iron Pipe shall conform to AWWA C115.

- B. Service Lines 3" and smaller shall conform to the applicable provisions of AWWA C800, and shall conform to the material requirements for the following piping materials:

Copper Tubing: Type K, hard drawn or annealed, conforming to ASTM B88. Joints shall be AWS A5.8, BCuP silver braze.

- C. All materials and construction shall conform, at a minimum, to Local Authority Having Jurisdiction (LAHJ) standards and specifications. Contractor is responsible for verification of LAHJ specifications prior to construction.

2.02 GATE VALVES - Up to 3 Inches (75 mm):

- A. Shall conform to local authority standards and specifications.

2.03 GATE VALVES - 3 Inches (75 mm) and Over

- A. Shall conform to local authority standards and specifications.

2.04 BALL VALVES - Up to 2 Inches (50 mm)

- A. Shall conform to local authority standards and specifications.

2.05 SWING CHECK VALVES - From 2 inches to 24 inches (50 mm to 600 mm)

- A. Shall conform to local authority standards and specifications.

2.06 BUTTERFLY VALVES - From 2 inches to 24 inches (50 mm to 600 mm)

- A. Shall conform to local authority standards and specifications.

2.07 BEDDING MATERIALS

- A. Bedding: Fill materials must be approved by soils engineer prior to placement and compaction. Cut trenches sufficiently wide to enable installation and inspection. The minimum bedding for all pipes is Class B as shown on the plans unless specified otherwise.

2.08 REQUIRED ACCESSORIES

- A. Concrete Thrust Blocks: Shall conform to local authority standards and specifications at a minimum.
- B. Backflow Prevention (BFP), Fire Department Connection (FDC), Post Indicator Valve (PIV): Shall conform to local authority standards and specifications.
- C. Meter(s): Shall conform to local authority standards and specifications.
- D. Manhole and Cover: Shall conform to local authority standards and specifications.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions, all existing utilities, verify and coordinate all existing and proposed service taps with Local authority standards and specifications. All existing service or water main taps or intersections shall be protected, maintained, and re-installed per Local Authority specifications when original taps or connections are relocated or moved to complete the proposed work.
- B. Verify that building service connection, vault, meter, and municipal utility water main size, location and invert are as indicated on the drawings.

- C. All construction which impacts fire lines or fire suppression system components in any way shall be done in strict accordance and with prior approval of the Fire Department having jurisdiction (FDHJ). Maintain fire protection service at all times as specified by the FDHJ.

3.02 PREPARATION

- A. Ream pipe and tube ends and remove burrs.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare pipe connections to equipment with flanges or unions.

3.03 BEDDING

- A. Excavate pipe trench in accordance with Section 02200 (2.07) and Section 02700 (3.03) for work of this Section. Hand trim excavation for accurate placement of pipe to elevations indicated.
- B. Place bedding material at trench bottom, level materials in continuous layers not exceeding 6 inches compacted depth. Minimum compaction for pipe trenches is 95% of standard proctor or as directed by the soils engineer.
- C. Maintain optimum moisture content of bedding material to attain required compaction density.

3.04 INSTALLATION - PIPE

- A. Maintain separation of water main from other underground utilities, pipes, or obstructions of one foot minimum.
- B. Install pipe to indicated elevation to within tolerance of 5/8 inches. Maintain minimum depth of cover over top of pipe of 48 inches or as specified Local authority standards and specifications, whichever is greater.
- C. Install ductile iron piping and fittings to ANSI/AWWA C600.
- D. Route pipe in straight line.
- E. Install pipe to allow for expansion and contraction without stressing pipe or joints.
- F. Install access fittings to permit disinfection of water system.

- G. Slope water pipe and position drain at low points.
- H. Form and place concrete for thrust blocks at each elbow or change of direction of pipe main and as specified by Local authority standards and specifications.
- I. Establish elevations of buried piping to ensure not less than 48 inches of cover over top of pipe.
- J. Install trace wire continuous over top of pipe.
- K. Backfill trench in accordance with Section 02200 (2.06).
- L. All materials and construction shall conform, at a minimum, to the manufacturer's standards and specifications.

3.05 INSTALLATION - VALVES

- A. Set valves on solid bearing.
- B. Center and plumb valve box over valve. Set box cover flush with finished grade.

3.06 DISINFECTION AND TESTING OF WATER PIPING SYSTEM

- A. Clean, pressure test, flush and disinfect system in accordance with local authority standards and specifications, all applicable AWWA standards, and reference standards herein (1.03) constituting minimum requirements. Provide documentation for all disinfection and testing procedures and results. All water lines must comply with 3.06 Disinfection and Testing of Water Piping System requirements.

3.07 SERVICE CONNECTIONS

- A. Provide water service tap per all utility authority requirements including but not limited to reduced pressure device(s), backflow prevention devices, vaults, valves, post indicator valve, fire department connection(s), and water meter(s) with by-pass valves as required by Local authority standards and specifications.

3.08 FIELD QUALITY CONTROL

- A. Field inspection and testing of earthwork will be performed under provisions of Section 02200 (1.06).

- B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest, until the work meets specified requirements.
- C. Frequency of Tests: As directed by the soils engineer.

END OF SECTION 02713

SECTION 02730 - SANITARY SEWERAGE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Sanitary sewerage drainage piping, structures, fittings, accessories and bedding.
- B. Connection of building sanitary drainage system to existing municipal sewer system.

1.02 RELATED DOCUMENTS/SECTIONS

- A. Contract documents and drawings, construction details as shown on the plans, geotechnical engineering report, and Referenced Standards are included herein by reference, latest revision shall apply. Refer to appropriate related sections as applicable.

1.03 REFERENCED STANDARDS

- A. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.
- B. ANSI/ASTM A74 - Cast Iron Soil Pipe and Fittings.
- C. ANSI/ASTM C12 - Practice for Installing Vitrified Clay Pipe Lines.
- D. ANSI/ASTM C14 - Concrete Sewer, Storm Drain, and Culvert Pipe.
- E. ANSI/ASTM C76 - Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
- F. ANSI/ASTM C425 - Compression Joints for Vitrified Clay Pipe And Fittings.
- G. ANSI/ASTM C443 - Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
- H. ANSI/ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.
- I. ANSI/ASTM D1557 - Test Methods for Moisture-Density Relations of

Soils and Soil-Aggregate Mixtures Using 10 lb (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

- J. ANSI/ASTM D2321 - Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
- K. ANSI/ASTM D2729 - Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- L. ANSI/ASTM D2751 - Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings.
- M. ANSI/ASTM D3033 - Type PSP Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- N. ANSI/ASTM D3034 - Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- O. ASTM A746 - Ductile Iron Gravity Sewer Pipe.
- P. ASTM C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
- Q. ASTM C700 - Vitrified Clay Pipe, Extra Strength, Standard Strength and Perforated.
- R. ASTM D1785 - Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.
- S. ASTM D2922 - Test Methods for Density of Soil and Soil- Aggregate in Place by Nuclear Methods (Shallow Depth).
- T. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.
- U. Shall conform to Local authority standards and specifications.
- V. ASTM C478 - Specification for Precast Reinforced Concrete Manhole Sections

When standards or specifications are indicated herein by reference, the referenced portion shall apply to the most recent edition of the publication and shall have the same force and effect as if they were included herein in their entirety.

1.04 DEFINITIONS

- A. Bedding: Fill placed under, beside and directly over pipe, prior to subsequent backfill operations. Cut trenches sufficiently wide to enable installation and inspection. The minimum bedding for all pipes is Class B as shown on the plans unless specified otherwise.

1.05 SUBMITTALS

- A. Provide data indicating pipe, pipe accessories, and manufacturer's warranties.
- B. Manufacturer's Installation Instructions: Indicate special procedures required to install products specified.
- C. Manufacturer's Certificate: Certify that products meet or exceed specifications and/or referenced standards.

1.06 PROJECT RECORD DOCUMENTS

- A. Submit complete, detailed as built drawings to Owner, Developer, and Architect upon completion of the work showing vertical and horizontal location. As built drawings shall be based on field run survey(s) and be sealed and signed by a registered surveyor in the State where the project is located. Provide three sets of original hard copies and one digital file in AutoCad or other acceptable digital format. Contractor is responsible for approval and verification of acceptable digital format. **As-built drawings will be required at a minimum 45 days prior to substantial completion.**
- B. Accurately record actual locations of pipe runs, taps, connections, valves, tees, mechanical joints, connections, pipes, manholes, structures, sub-surface drain fields, septic tanks, lift stations, service taps or stubouts, type and size of material, and top and invert elevations of all structures.
- C. Identify and describe unexpected variations to subsoil conditions or discovery of uncharted utilities or other structures. All such uncharted utilities or structures shall be shown on as built drawings.

1.07 REGULATORY REQUIREMENTS

- A. Conform to all applicable Federal, State, County, City, or local jurisdiction requirements concerning sanitary sewer construction and

safety.

- B. **WARNING:**
CONTRACTOR SHALL: COMPLY WITH ALL OSHA, FEDERAL, STATE, LOCAL, AND INDUSTRY STANDARD SAFETY MEASURES, DEVICES, PROCEDURES, PRECAUTIONS, AND EQUIPMENT FOR ALL WORK OR OTHER ACTIVITIE(S). NO PERSON(S) SHALL ENTER MANHOLES, CONFINED SPACES, OR OTHER UNDERGROUND STRUCTURES, SPACES, TRENCHES, OR EXCAVATIONS WITHOUT PROTECTIVE BREATHING APPARATUS AND ALL OTHER REQUIRED SAFETY MEASURES, DEVICES, PROCEDURES, AND EQUIPMENT, AND AT LEAST ONE OTHER PERSON PRESENT ABOVE GROUND FOR SAFETY AND MONITORING AT ALL TIMES. CONTRACTOR SHALL PROVIDE AND ENSURE USE OF SAFETY KITS, HELMETS, GLOVES, EMERGENCY OXYGEN RESUSCITAOR KITS, AND AIR QUALITY AND GAS DETECTORS FOR VOLATILE, TOXIC, OR EXPLOSIVE GASES OR SUBSTANCES. VERIFY SAFE OXYGEN CONTENT PRIOR TO ENTERING MANHOLES, CONFINED SPACES, OR OTHER UNDERGROUND STRUCTURES.

1.08 FIELD MEASUREMENTS

- A. Verify that field measurements and elevations are as indicated by the manufacturer.

1.09 COORDINATION

- A. Coordinate work with other underground utilities, both existing and proposed. Verify all existing utilities concerning type, size, location and depth prior to start of construction.
- B. Coordinate the Work with termination of sanitary sewer connection outside building.

1.10 DESCRIPTION OF WORK

- A. When any construction, materials, or specifications for the same or similar item(s) are shown in more than one place in the construction documents, plans, or specifications, the more stringent requirement shall apply as determined by the Engineer.

PART 2 - PRODUCTS

2.01 SANITARY SEWER PIPE MATERIALS

- A. All sanitary sewer structures, piping, materials and installation shall conform to the local authorities having jurisdiction standards and specifications. In the absence of local authority standards and specifications, all materials and construction shall conform, at a minimum, to the current Georgia Department of Transportation (GDOT) standards and specifications, and as specified herein, whichever is greater. The Contractor is responsible for verification of current applicable standards and specifications prior to construction.
- B. Ductile Iron Pipe: Shall conform to Local authority standards and specifications.
- C. Ductile Iron Pipe Joint Device: Shall conform to Local authority standards and specifications.
- D. Plastic Pipe: Shall conform to Local authority standards and specifications.
- E. PVC Pipe: Shall conform to Local authority standards and specifications, minimum SDR 35.

2.02 PIPE ACCESSORIES

- A. Pipe Joints: Mechanical clamp ring type, stainless steel expanding and contracting sleeve, neoprene ribbed gasket for positive seal.
- B. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.
- C. Trace Wire: Magnetic detectable conductor, brightly colored plastic covering, imprinted with "Sewer Service" in large letters shall be placed for underground piping.
- D. All pipe joints shall provide a permanent, secure watertight seal.

2.03 BEDDING MATERIALS

- A. Bedding: Fill materials must be approved by Soils Engineer prior to placement and compaction.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify all existing utility structures regarding location and elevation prior to construction. Verify that trench is graded and prepared according to plans and specifications prior to pipeline construction.

3.02 PREPARATION

- A. Hand trim excavations to required elevations. Correct over-excavation with fine aggregate or as directed by the soils engineer. Verify all fill material as suitable with the soils engineer prior to placement and compaction.
- B. Remove large stones, debris, rock, roots, organic material, or other hard matter which could damage piping or impede consistent backfilling or compaction.

3.03 BEDDING

- A. Excavate pipe trench in accordance with Section 02200 for work of this section. Hand trim excavation for accurate placement of pipe to elevations indicated. Cut trenches sufficiently wide to enable installation and inspection. The minimum bedding for all pipes is Class B as shown on the plans unless specified otherwise.
- B. Place bedding material at trench bottom, level materials in continuous layers not exceeding 6 inches compacted depth. Minimum compaction for pipe trenches is 95% of standard proctor or as directed by the soils engineer.
- C. Maintain optimum moisture content of bedding material to attain required compaction.

3.04 INSTALLATION - PIPE

- A. Install pipe, fittings, and accessories in accordance with manufacturer's instructions. All joints shall be permanent, secure, and watertight.
- B. Lay pipe to slope gradients noted on drawings, with maximum variation from true slope of 1/8 inch in 10 feet, non cumulative.

- C. Install pipe bedding aggregate at bottom, sides and over top of pipe where required and as shown on the drawings. Provide top cover to minimum compacted thickness of 12 inches, compact to minimum 95% standard proctor.
- D. Refer to Section 02200 for trenching requirements. Do not displace or damage pipe when compacting.
- E. Refer to Section 02200 for field testing requirements for fill materials.
- F. Install tracer wire on all pipe runs, drain field tiles, and underground piping.

3.05 INSTALLATION – MANHOLES, JUNCTIONS, STRUCTURES

- A. All manholes, junctions, or structures shall be precast reinforced concrete, with paved invert channels per current GDOT standards and specifications. All grout shall be nonmetallic, non-shrink type conforming to ASTM C 1107, with minimum 28 day compressive strength of 6500 psi. Set all manholes plumb. Install per manufacturer's specifications.
- B. Manhole, junction, or structure riser sections shall be watertight and sealed per manufacturer's specifications and reference standards using preformed resilient gaskets. Joints between manholes or structures and base sections shall be grouted on the inside to provide a smooth surface. Manhole sections shall grouted to ring and covers on the inside. Comply fully with ASTM C478.
- C. All pipe or other penetrations into manholes, structures, or junctions shall be sealed watertight. Provide resilient connectors manufactured for use in contact with sanitary sewer conforming to ASTM C923 and the local authority having jurisdiction specifications. All penetrations shall be fully sealed, permanent, and watertight.

3.06 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 02200.
- B. If tests indicate Work does not meet specified requirements, remove Work, replace and retest, until the work meets specified

requirements.

- C. Frequency of Tests: As directed by the soils engineer.

3.07 PROTECTION

- A. Protect finished Work from damage during construction. Damaged work shall be replaced at the expense of the contractor.
- B. Protect pipe and aggregate cover from damage or displacement until backfilling operation is in progress.

END OF SECTION 02730

SECTION 02831 - FENCING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Fencing, fittings, accessories.

1.02 RELATED DOCUMENTS/SECTIONS

- A. Contract documents and drawings, construction details as shown on the plans, geotechnical engineering report. Refer to appropriate related sections as applicable.

1.03 FENCING

- A. All materials and construction shall conform to the Chain Link Fencing Manufacturers Institute (CLFMI) standards and specifications and the local authority having jurisdiction, and the plans and specifications. Provide all materials and accessories from a single source.

- B. TEMPORARY CONSTRUCTION FENCING: Contractor shall provide temporary fencing as required for safety of all person(s) onsite for all phases of construction.

Temporary fence characteristics: Minimum 6 feet overall exposed height, minimum 12-1/2 gauge hog wire (no barbed wire) tied at 12 inches on center, with drive-in metal posts securely anchored, minimum driven post depth is 18 inches, or deeper as required for stability. Maximum post spacing is 8.0 feet. Provide concrete footings where necessary to stabilize fencing. Contractor to increase minimum fence criteria as required, per Code(s), and to suit his other needs for security and safety.

Gates required: As necessary, with padlocks. Provide warning and no access signage at 10 foot intervals along all temporary fencing.

TEMPORARY CONSTRUCTION FENCING LOCATIONS:

Temporary construction fencing locations shall be including but not limited to: around all construction work areas, along entire top edge perimeter of all shoring or sheet piling walls, storage areas, and construction staging/parking areas. At additions or renovations to existing buildings, all area(s) necessary to provide all person(s) safe access to all areas in use or required by Owner. Adjust temporary fencing location(s) and gate(s) as required for each phase of construction to provide protection and safety for all person(s) onsite

and for all areas, functions, or uses as required by Owner.

Provide safe access or pathways including but not limited to sidewalks, steps, and railing per standard details and Code(s) where designated by Owner/Engineer, with directional and warning signage for all pedestrian traffic.

Coordinate with Owner all required access and use areas prior to and throughout construction for each phase or required use.

1.04 DESCRIPTION OF WORK

- A. When any construction, materials, or specifications for the same or similar item(s) are shown in more than one place in the construction documents, plans, or specifications, the more stringent requirement shall apply as determined by the Engineer.

PART 2 - PRODUCTS

2.01 GENERAL

- A. All materials and construction shall conform to the Chain Link Fencing Manufacturers Institute (CLFMI) standards and specifications. Provide all materials and accessories from a single source. All fencing material shall be vinyl coated unless noted otherwise. Verify color with Architect/Owner prior to construction.
- B. Fabric: 2-inch diamond mesh. Minimum 9 gauge galvanized steel wire. Knuckle selvage top and bottom.
- C. Terminal and Gate Posts: 3-inch o.d., hot-dipped galvanized, schedule 40 steel pipe. Lengths = Exposure + 36" for embedment.
- D. Line Posts: 2-inch o.d., hot-dipped galvanized, schedule 40 steel pipe. Lengths = Exposure + 30" for embedment.
- E. Post Caps: Required for all posts. Size to suit posts, integral eye for passage of top rail or tension wire.
- F. Top Rails: 1-5/8 inch o.d., hot-dipped galvanized, schedule 40 steel pipe. Fabricate for swedge-type joints.
- G. Braces: Material same as rails.
- H. Fabric Tension Bars: 3/16" x 3/4" hot-dipped galvanized, single piece

full height of fabric. Bands shall be 11 gauge x 7/8" wide.

- I. Tension Wire: 7 gauge coated steel coil spring wire. Required at bottom of all fencing.
- J. Fabric Ties: 11 gauge aluminum alloy.
- K. Gates:
 - Framework and diagonal bracing: Same as top rail pipe, shop fabricated welded construction, all welds ground smooth, hot-dipped galvanized.
 - Hinges: Offset non-liftoff type to achieve 180-degree opening, minimum 1 for each 24" of gate height or fraction thereof.
 - Latch: Fork type or plunger bar type with integral padlock eye to permit operation and unlocking from either side of gate.
 - Keeper: 1 for each leaf, automatically engages gate leaf and holds leaf open until manually released.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Layout fencing per Contract drawings and/or actual site conditions. Temporary construction fencing shall be provided as required to protect all persons from work/construction areas, provide for the safety of the public, and provide safe access for Owner as necessary for normal operation.
- B. Set all posts plumb. All permanent fencing posts shall be set in center of 3000 psi concrete footings in firm solid earth. Terminal and gate posts set in 12" diameter x 42" depth footings, line posts set in 10" diameter x 36" depth footings. Post lengths to achieve minimum 6" concrete coverage under post bottom and sides, posts shall not contact earth. Top of concrete finished smooth, set to finished grade, and sloped away from post to shed water. Exposed post height to achieve fabric height plus 2 inches of fabric clearance above finished grade.
- C. Locate terminal posts at all corners and changes of direction. Install braces at each terminal post with pressed steel connectors.
- D. Locate gate posts at both gate jambs of each gate. Install braces at each gate post with pressed steel connectors. Line posts evenly spaced at maximum 10.0 feet on center.
- E. Tie fabric to posts at 15" o.c. maximum, tie fabric to top rails at 24" o.c. maximum.
- F. Top rails shall be installed parallel to finish grade.
- G. Adjust gates and gate hardware for smooth operation without binding or scraping.
- H. Remove temporary construction fencing at completion of project.

3.02 PROTECTION

- A. Protect finished Work from damage during construction. Damaged work shall be replaced at the expense of the contractor.

END OF SECTION 02831

SECTION 02900 - LAWNS, GRASSING, & LANDSCAPING

PART 1 - GENERAL

1.01 PERMANENT GRASSING REQUIREMENTS:

THE CONTRACTOR SHALL ESTABLISH PERMANENT GRASSING ON ALL DISTURBED AREAS PRIOR TO FINAL RELEASE WHETHER SHOWN ON THE PLANS OR NOT.

1.02 SECTION INCLUDES

- A. Lawns, grassing, and landscaping materials and planting instructions.

1.03 RELATED DOCUMENTS/SECTIONS

- A. Contract documents and drawings, construction details as shown on the plans, geotechnical engineering report. Refer to appropriate related sections as applicable.

1.04 WARRANTIES

- A. Warranty commencement date will be date of final approval and release after all grassing and landscaping is complete, established and accepted by Owner or Architect.
- B. Materials:
 - 1. Sod and grasses:
One year following Owner acceptance.
 - 2. Evergreen shrubs, bushes, & trees:
One year following Owner acceptance.
 - 3. Deciduous Plants and trees:
90 days following Spring breakout of growth.
- C. Replacement policies:
 - 1. Materials which have either died or failed to show satisfactory vigorous growth shall be removed and replaced with equal as-specified materials.
 - 2. Warranty periods for replaced materials shall commence on the Owner-acceptance dates for these materials, and warranty criteria shall be the same as outlined above.

3. If replaced materials become unsatisfactory within their new warranty periods, the Owner reserves the right to require continued replacements or obtain a credit from the Contractor for the value of the unsatisfactory materials.

1.05 REFERENCED STANDARDS

- A. Standardized Plant Names, latest edition, by the American Joint Committee on Horticultural Nomenclature.
- B. American Standard for Nursery Stock, latest edition, by the American Association of Nurserymen.

When standards or specifications are indicated herein by reference, the referenced portion shall apply to the most recent edition of the publication and shall have the same force and effect as if they were included herein in their entirety.

1.06 QUALITY CONTROL

- A. Only tree or plant material grown in a recognized nursery in accordance with good horticultural practice will be accepted. Provide healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun-scald, injuries, abrasions or disfigurement.
- B. All materials and construction required for completion of the work under this section are subject to the approval of the Owner/Architect. The Owner/Architect shall have the right to reject any and all materials and construction which, in their own opinion, does not meet the requirements of the Contract Documents. The Contractor shall remove all rejected work or material from the job site and replace promptly according to the Contract Documents at no expense to the Owner.

1.07 DESCRIPTION OF WORK

- A. When any construction, materials, or specifications for the same or similar item(s) are shown in more than one place in the construction documents, plans, or specifications, the more stringent requirement shall apply as determined by the Engineer.

PART 2 - PRODUCTS

2.01 GENERAL

- A. PERMANENT GRASSING: (Sodded, seeded, or sprigged):
VERIFY AREAS TO BE SODDED WITH OWNER PRIOR TO CONSTRUCTION.

Seed: Common Bermuda (Cynodon dactylon), 98% purity, 85% germination, with State Dept. of Agriculture tag, or as specified by Owner.

Sod and sprigs: Hybrid Bermuda, Tifway 419, or as specified by Owner.

- B. TEMPORARY GRASSING:
As shown on plans, or Kentucky 31 Fescue and/or winter rye, allowed for Contractor's convenience to control erosion or other purposes. Temporary grass must be tilled under and soil prepared for permanent grassing per specifications.

- C. LANDSCAPING MATERIALS:
Plants: True to species and variety, complying to ANSI Z60.1 "Standard for Nursery Stock".
Trees: Of height and caliper listed with branching configuration conforming to ANSI Z60.1 for type and species required. Provide only single stem trees.
Ground cover: Provide plants well established and well rooted in removable containers with not less than the minimum number and length of runners conforming to ANSI Z60.1 for the pot or container size listed.

- D. FERTILIZER:
Commercial slow release type, 5% nitrogen, 10% phosphoric acid, 15% potash.

- E. LIME: Ground dolomitic limestone.

- F. WATER:
Contractor shall furnish all water as required for establishment and maintenance of all grassing (sod or seed), trees, shrubs, plants, and other landscape materials until final approval and acceptance by Owner and Architect. Contractor is responsible for water source, transportation, distribution, and necessary equipment.

- G. MULCH:

Pine bark mini-nuggets or shredded hardwood mulch (color per Architect).

- H. SOD:
Remove all netting, backing, or other packing or shipping attachments from Sod prior to installation.

PART 3 - EXECUTION

3.01 GENERAL

- A. Contractor is solely and fully responsible for compliance with recommended and seasonal planting dates for all seeding, grassing, sod, trees and shrubs, and all other landscape materials to facilitate construction schedule and stabilize disturbed areas. Any planting or installation of any landscaping or grassing materials outside recommended planting dates will require additional warranties and delay final release and payment for all affected material and labor cost(s). Contractor shall review all drawings and specifications, and locate and protect from damage any and all existing or proposed utilities or site improvements prior to landscape excavation or work. Contractor shall restore any damaged improvements or utilities at no expense to Owner.
- B. SOIL SAMPLES: Contractor shall take several soil samples from each area where landscaping will occur. Samples shall be taken to represent each different soil or site condition encountered in the required landscaping areas. Soil samples shall be sent for analysis to the Agricultural Extension Service (AES). Provide the A/E with the written report of AES recommendations for soil amendments and fertilizers to be used on the site. All recommendations from the AES will become minimum requirements. No adjustment in Contract Time or Contract Sum will be allowed for soil sampling and analysis.
- C. TOP SOIL: Provide topsoil which is fertile, friable, natural loam surface soil, free of subsoil, clay lumps, brush, weeds and other debris, free of roots, stumps, stones larger than 1/2" diameter in any dimension, and any other extraneous or toxic material or debris harmful to plant growth. The Contractor is solely responsible for obtaining and distributing all required topsoil material for grassing, planting, and landscaping the project, regardless of the source. Minimum 5 inch depth of topsoil required for all grassed areas, minimum 9 inch depth of topsoil required for shrubbery, flower, or planting beds or areas.

D. FINISH GRADE REQUIREMENTS:

- a. Within 0.10 feet of required grade provided positive drainage is maintained. No ponding or depressed areas allowed.
- b. Smooth and uniform to accomplish mowing of grass to uniform heights without scalping. Remove all stones 1/2" and larger in diameter prior to grassing operations.
- c. Sloped at minimum 1.0% grade for proper drainage away from buildings and into storm sewer system.
- d. Sod shall be set in place with snug and staggered joints, and rolled to remove high or low or undulating areas.
- e. **Contractor shall coordinate all landscaping to ensure that finished grades are provided as shown on plans, particularly along the interface with the building perimeter to ensure positive drainage away from building(s), structures, and all other improvements which may be damaged by water or runoff. Maintain minimum 6 inches below finish floor elevation (FFE) and top of finished grass, landscape, or mulch along entire building or structure perimeter. Verify FFE along entire building or structure perimeter PRIOR TO CONSTRUCTION. Adjust subgrade, topsoil, and mulch as required to allow for grass and landscape material thickness.**

E. PERMANENT GRASSING:

The Contractor is responsible for establishing final permanent grassing on all disturbed areas in accordance with the Contract Documents whether shown on the plans or not. All temporary grassing which does not comply with the required permanent grassing materials and were installed for erosion control measures or the convenience of the Contractor, shall be fully tilled under, then the soil shall be prepared for permanent grassing in accordance with Contract Documents.

F. ACCEPTABLE UNIFORM STAND OF GRASS:

An acceptable uniform stand of grass is defined as:

Establishment of the specified grass, properly watered, maintained, mowed, and free of weeds, with the grass having a minimum coverage of 97% over the required areas and only scattered bare spots, none of which is larger than one (1) square foot in area. Coverage is defined as mature healthy

grass with established root systems, thickness and density per normal species nursery standards for grass in good condition.

- G. MOWING SCHEDULE:
 - A. All grass clippings shall be removed from property with EACH mowing.
 - B. When grass reaches a height of three (3) inches, mow to 2/3 height, leaving two (2) inches remaining.
 - C. Maintain a grass height between two (2) and two and one-half (2.5) inches until final acceptance.
 - D. Perform mowing approximately weekly, or as required to fulfill the criteria in this section, for a total of not less than four (4) mowings prior to final acceptance and release. Establish grass in timely manner to meet this requirement prior to final release and acceptance.
- H. GRASS MAINTENANCE & ACCEPTANCE:

Contractor shall maintain grass until final release and acceptance but for not less than 60 calendar days after seeding/sodding or planting. Maintenance shall include watering per nursery/supplier standards, additional watering for initial period after planting per accepted nursery standards, and all other recommended measures to ensure root system establishment and healthy grass. Full grass coverage shall be required within 60 calendar days of planting. The Contractor is responsible for establishment of permanent grassing and landscaping, including mowing, watering, and maintenance requirements, prior to final release and acceptance.
- I. TREE, SHRUB, LANDSCAPING MAINTENANCE & ACCEPTANCE:

Contractor shall install, establish, and maintain trees, shrubs, and landscaping until final release and acceptance but for not less than 60 calendar days after proper installation. Maintenance shall include watering per nursery/supplier standards, additional watering as required for initial period after planting per accepted nursery standards, and all other recommended measures to ensure root system establishment and healthy trees, shrubs, and landscape materials. The Contractor is responsible for installation of trees, shrubs, and landscaping including watering, mulching, and maintenance requirements, prior to final release and acceptance.

3.02 EXCAVATION & PREPARATION

- A. TREES, SHRUBS, & OTHER PLANTED MATERIALS:
 - 1. Excavate pits, beds, or trenches with vertical sides.

2. Loosen hardpan and moisture barrier to a depth of 2 feet minimum below bottom of tree pit or until hardpan has been broken and moisture drains freely. For shrub beds, loosen hardpan 6 inches minimum below bottom of excavation.
3. For balled & burlapped (B&B) trees and shrubs, make excavations at least 50% larger width than the ball diameter and equal to the ball depth, plus allowing for 6 inch minimum setting layer of planting soil mixture.
4. Mix all soil amendments thoroughly into topsoil as required by soil analysis and manufacturers recommendations prior to backfilling.
5. Plant trees and shrubs according to nursery specifications.
6. Provide minimum 3 inch depth mulch to cover all disturbed areas for tree planting and planting beds for shrubs, plants, or flowers. Verify with Owner/Architect extent of all areas to receive mulch prior to construction.
7. **The Contractor shall provide a professional landscape contractor with minimum two years experience in landscaping and tree, shrub, planted material installation. Landscape contractor must be engaged in landscaping full time as majority of his business. Landscaping contractor shall be submitted to and approved by Owner/Architect prior to start of landscaping work. Landscape contractor shall provide a minimum 12 month warranty for all lawns/grass/landscaping installed.**

B. TREE & SHRUB RELOCATION:

1. Contractor shall engage and provide a qualified arborist for review and recommendation regarding all trees and shrubs to be transplanted or relocated. Arborist shall be qualified according to standards referenced herein, and recognized industry standards for this work.
2. Contractor shall review requirements of Arborist with Owner/Architect regarding cost and chance for survival prior to proceeding with the work.
3. All materials and construction shall be in accordance with Arborist's recommendations and specifications.
4. Contractor shall provide a qualified subcontractor to complete this work (see 3.02 A (6) above) with experience and qualifications

acceptable to Owner/Architect.

5. Provide minimum 3 inch depth mulch to cover all disturbed areas for tree planting and planting beds for shrubs, plants, or flowers. Verify with Owner/Architect extent of all areas to receive mulch prior to construction.

C. PLANTING BEDS:

1. Loosen subgrade of planting bed areas to minimum 6 inch depth. Remove stones larger than 1" diameter, sticks, roots, or other debris.

2. Mix all soil amendments thoroughly into topsoil as required by soil analysis and manufacturers recommendations prior to backfilling.

3. Spread planting soil mixture to minimum depth to meet proposed grades, allow for natural settlement. Work into top of loosened subgrade to create transition layer, then place remainder of planting soil.

4. Plant according to nursery specifications.

5. Provide minimum 3 inch depth mulch to cover all disturbed areas for tree planting and planting beds for shrubs, plants, or flowers. Verify with Owner/Architect extent of all areas to receive mulch prior to construction.

D. GRASS AREAS:

1. Loosen subgrade of areas to be grassed to a minimum 6 inch depth. Remove stones larger than 1" diameter, sticks, roots, trash, or other debris.

2. Place 50% of required topsoil, work into loosened subgrade to create transition layer. Place remaining topsoil to meet proposed grades.

3. Allow for sod thickness in areas to be sodded to meet finish grades.

4. Grade areas to be grassed to smooth, even surface, with loose, uniformly fine texture. Roll, rake, and remove ridges and depressions to meet finish grades.

5. Apply all fertilizer, lime, and soil amendments required for grass type selected according to the soils sample analysis prior to installing grass. Work into top 6 inches of soil.

6. Moisten prepared grass areas if soil is dry. Water thoroughly and allow surface to dry before planting grass.

3.03 INSTALLING LAWNS AND GRASSING

A. SEEDING GRASSED AREAS:

1. Do not use wet seed. Day laborers or other unskilled workers shall not be used for lawn and grass installation. All grass areas shall be prepared in accordance with section 3.02 (D).

The Contractor shall provide a professional landscape contractor with minimum two years experience in landscaping and lawn/grass installation. Landscape contractor must be engaged in landscaping full time as majority of his business. Landscaping contractor shall be submitted to and approved by Owner/Architect prior to start of landscaping work. Landscape contractor shall provide a minimum 12 month warranty for all lawns/grass/landscaping installed.

2. Sow seed using a spreader or seeding machines. Grass seed shall be applied at a rate according to nursery specifications, not less than 40 pounds per acre. Do not seed when wind velocity exceeds 5 mph. Distribute seed evenly over entire area by sowing equal quantity in two directions at right angles to each other.
3. When Hydro-seeding, soil preparation and all other requirements of the Contract Documents and specifications must be fully implemented.
4. Rake seed lightly into top 1/8" of soil, roll lightly.
5. Water immediately after seeding with a fine spray, soaking to a minimum depth of four (4) inches. Keep grassed areas continuously moist until grass is established.
6. Protect seeded areas with mulch to a depth not less than 1.5 inches immediately after seeding is complete. Mulch material and application shall comply, at a minimum, with erosion control specifications.
7. Protect seeded areas from traffic or damage.
8. Scarify, re-seed and re-fertilize seeded areas that do not show satisfactory growth within fifteen days after sowing, until satisfactory stand of grass is established.

B. SODDING GRASSED AREAS:

1. Do not use day laborers or unskilled workers.

The Contractor shall provide a professional landscape contractor with minimum two years experience in landscaping and lawn/grass/sod installation. Landscape contractor must be engaged in landscaping full time as majority of his business. Landscaping contractor shall be submitted to and approved by Owner/Architect prior to start of landscaping work. Landscape contractor shall provide a minimum 12 month warranty for all lawns/grass/landscaping installed.

2. Remove all netting, tags, pins, or other non organic packing or shipping materials prior to sod installation. Install sod within 36 hours of harvesting. Lay sod with tight joints, overlaps or gaps will not be allowed. Stagger sod joints, lay sod with long edge perpendicular to slope. Trim sod with sharp bladed instrument for clean cut, jagged edges not allowed. All sod areas shall be prepared in accordance with section 3.02 (D).

3. On slopes steeper than 3H:1V, sod shall be anchored with pins or other approved methods.

4. Installed sod shall be rolled and tamped to provide solid contact between sod and soil.

5. Irrigate sod and soil to a depth of 6 inches immediately after installation. Irrigate sod daily after installation to maintain moisture at 6 inch depth for a minimum 30 days, and as needed thereafter for health and maintenance of grass.

6. Sod shall be certified by supplier as meeting all requirements of plans and specifications, and for grass type selected.

7. Sod delivery, storage, and installation shall conform to Turfgrass Producers International (1995) Guideline Specifications to turfgrass sodding (TPI GSS).

8. Comply with supplier's standards and recommendations for sod delivery, storage, and installation. Do not install sod on frozen or freezing soil.

9. Protect sodded areas from traffic or damage.

END OF SECTION 02900

SECTION 04200 - UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Concrete masonry units.
 - 2. Building (common) brick.
 - 3. Architectural Block – Split face block
 - 4. Mortar and grout.
 - 5. Embedded flashing.
 - 6. Cavity-wall insulation.

1.3 DEFINITIONS

- A. CMU(s): Concrete masonry unit(s).
- B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PERFORMANCE REQUIREMENTS

- A. Provide **structural** unit masonry that develops indicated net-area compressive strengths at 28 days.
 - 1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.
 - 2. Determine net-area compressive strength of masonry by testing masonry prisms according to ASTM C 1314.

1.5 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection:
 - 1. Decorative CMUs, in the form of small-scale units.
 - 2. Brick.
 - 3. Colored mortar.
 - 4. Weep holes/vents.
 - 5. Cavity wall insulation
 - 6. Flashing and drainage system.

- C. Material Certificates: For each type and size of the following:
1. Masonry units.
 - a. Include material test reports substantiating compliance with requirements.
 - b. For brick, include size-variation data verifying that actual range of sizes falls within specified tolerances.
 - c. For exposed brick, include test report for efflorescence according to ASTM C 67.
 - d. For masonry units, include data and calculations establishing average net-area compressive strength of units.
- D. Mix Designs: For each type of mortar. Include description of type and proportions of ingredients.
1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.
 2. Include test reports, according to ASTM C 1019, for grout mixes required to comply with compressive strength requirement.
- E. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net-area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry determined according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.
- F. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.
- B. 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, from single source from single manufacturer for each product required.
- C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.
- D. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.
- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Build mockup of typical wall section as shown on Drawings.
 2. Build mockups for each type of exposed unit masonry construction 72 inches long by 60 inches high by full thickness, including CMU, brick, flashing, drainage material and accessories.
 - a. Include a full height sealant-filled joint in mockup.
 - b. Include lower corner of window opening at upper corner of exterior wall mockup. Make opening approximately 12 inches wide by 16 inches high.
 - c. Include through-wall flashing installed along entire length of wall, with a 12-inch length of flashing left exposed to view (omit masonry above half of flashing).

- d. Include veneer anchors, flashing, cavity drainage material, and weep holes in exterior masonry-veneer wall mockup.
- 3. Clean one-half of exposed faces of mockups with masonry cleaner as indicated.
- 4. Protect accepted mockups from the elements with weather-resistant membrane.
- 5. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
 - a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
 - b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
- 6. Approved mockups may not become part of the completed Work and shall remain until substantial completion.
 - a. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing
- F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 "Project Management and Coordination."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. 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.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.
- E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.8 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 of walls and hold cover securely in place.
 - 2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three 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 spreading coverings 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 higher and will remain so until masonry has dried, but not less than seven days after completing cleaning.
- E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

PART 2 - PRODUCTS

2.1 MASONRY UNITS, GENERAL

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.
- B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

2.2 CONCRETE MASONRY UNITS

- A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.
1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
 2. Provide bullnose units for all outside corners, door and window jambs and other openings unless otherwise indicated. The first course immediately adjacent to the finished floor shall not have a bullnose corner.
- B. CMUs: ASTM C 90.
1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1900 psi.
 2. Density Classification: Lightweight.
 3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.

- C. Architectural Block – Split face block
 - 1. Provide manufacturer's integrally colored, pre-finished architectural split face masonry units. By Old Castle, Sequatchie Concrete or Lee Building Products.
 - 2. Manufactured with W.R. Grace DRY-BLOCK, or equal, water repellent admixture.

2.3 MASONRY LINTELS

- A. Masonry Lintels: Built-in-place masonry lintels made from bond beam CMUs 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.

2.4 BRICK

- A. General: Provide shapes indicated and as follows, with exposed surfaces matching finish and color of exposed faces of adjacent units: Facing brick complying with ASTM C 216 as amended herein
 - 1. Size: Modular
 - 2. For ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces, provide units without cores or frogs and with exposed surfaces finished.
 - 3. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.
 - 4. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.
 - 5. Provide special shapes for applications where shapes produced by sawing would result in sawed surfaces being exposed to view.
 - 6. Include in the Base Bid an allowance of \$1,250.00 per 1000 bricks. This allowance is for the purchase of brick only. All other labor, accessories and materials shall be included in the work. The Contractor shall determine the quantity of bricks required to complete the work included in the Contract Documents and use this to determine the required allowance. Upon selection of the brick, any unused funds shall be refunded to the Owner based on a calculation of the difference in price per 1000 bricks and the quantities determined by the contractor in his Base Bid as indicated on the Proposal Form. The Contractor's quantities shall include all calculations for waste, cull and etc. needed to complete the work. No increase in quantities will be allowed after receipt of proposals.

2.5 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I, 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 and hydrated lime containing no other ingredients.
- D. Masonry Cement: ASTM C 91.
- E. Mortar Cement: ASTM C 1329.

- F. Colored Cement Product: Packaged blend made from masonry cement and mortar pigments, all complying with specified requirements, and containing no other ingredients.

1. Colored Masonry Cement:

a. Products:

- 1) Mortamix Color Masonry Cement.
- 2) Holcim (US) Inc.; Rainbow Mortamix Custom Color Masonry Cement.
- 3) Lafarge North America Inc.; U.S. Cement Custom Color Masonry Cement.
- 4) Argos Custom Color Masonry Cement.
- 5) National Cement Company, Inc.; Coosa Masonry Cement.

- G. Water: Potable.

2.6 REINFORCEMENT

- A. Masonry Joint Reinforcement, General: See the Structural documents for all masonry reinforcement.

2.7 EMBEDDED FLASHING MATERIALS

A. Flexible Flashing:

1. Rubberized-Asphalt Flashing: Composite flashing product consisting of a pliable, adhesive rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film to produce an overall thickness of not less than 0.040 inch.

a. Products:

- 1) Carlisle Coatings & Waterproofing; CCW-705-TWF Thru-Wall Flashing.
- 2) Dayton Superior Corporation, Dur-O-Wal Division; Dur-O-Barrier Thru-Wall Flashing.
- 3) Grace Construction Products, W. R. Grace & Co. - Conn.; Perm-A-Barrier Wall Flashing.
- 4) W. R. Meadows, Inc.; Air-Shield Thru-Wall Flashing.

- b. Accessories: Provide preformed corners, end dams, other special shapes, and seaming materials produced by flashing manufacturer.

- B. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by flashing manufacturer for bonding flashing sheets to each other and to substrates.

2.8 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 neoprene

- B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and 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 (No. 30 asphalt felt).

- D. Weep/Vent Products: Use the following unless otherwise indicated:
1. Cellular Plastic Weep/Vent: One-piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of outer wythe, in color selected from manufacturer's standard.
 - a. Products:
 - 1) Advanced Building Products Inc.; Mortar Maze weep vent.
 - 2) Blok-Lok Limited; Cell-Vent.
 - 3) Dayton Superior Corporation, Dur-O-Wal Division; Cell Vents.
 - 4) Heckmann Building Products Inc.; No. 85 Cell Vent.
 - 5) Hohmann & Barnard, Inc.; Quadro-Vent.
 - 6) Wire-Bond; Cell Vent.
- E. Cavity Drainage Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.
1. Provide the following configuration:
 - a. Strips, full-depth of cavity and 10 inches high, with dovetail shaped notches 7 inches deep that prevent clogging with mortar droppings.
 - 1) Basis-of-Design Product: Subject to compliance with requirements, provide Keene Building Products; KeeneStone Cut or comparable product by one of the following:
 - a) Mortar Net USA, Ltd.

2.9 MASONRY-CELL INSULATION

- A. Foam Insulation: Two-component consisting of amino-plast resin and a catalyst foaming agent surfactant. All exterior CMU wall cells to be filled.
1. Products:
 - a. Core-Fill 500.

2.10 CAVITY-WALL INSULATION

- A. Extruded-Polystyrene Board Insulation: ASTM C 578, Type IV closed-cell product extruded with an integral skin.
- B. Extruded-Polystyrene Board Insulation with Increased R-Value: ASTM C 578, Type IV, 2" thick, closed-cell product with an integral skin.
- C. Adhesive: Type recommended by insulation board manufacturer for application indicated.

2.11 MASONRY CLEANERS

- A. 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.

1. Manufacturers:
 - a. Diedrich Technologies, Inc.
 - b. EaCo Chem, Inc.
 - c. ProSoCo, Inc.

2.12 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.
 1. Do not use calcium chloride in mortar or grout.
 2. Limit cementitious materials in mortar to Portland cement and lime.
- B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in 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, proportion Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry. Substitutions must be approved prior to use.
 1. For masonry below grade or in contact with earth, use Type M.
 2. For reinforced masonry, use Type S.
 3. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type M or Type S. For brick use type N.
- D. Pigmented Mortar: Select and proportion pigments with other ingredients to produce color required.
 1. Pigments shall not exceed 10 percent of portland cement by weight.
 2. Mix to match Architect's sample.
 3. Application: Use pigmented mortar for exposed mortar joints with the following units:
 - a. Concrete facing brick.
 - b. Face brick.
- E. Grout for Unit Masonry: Comply with ASTM C 476.
 1. Use grout of type indicated on structural documents.
 2. Proportion grout in accordance with ASTM C 476, Table 1 or paragraph 4.2.2 for specified 28-day compressive strength indicated, but not less than 2000 psi.
 3. Provide grout with a slump of **8 to 11 inches** as measured according to ASTM C 143/C 143M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.

2. Verify that foundations are within tolerances specified.
 3. Verify that reinforcing dowels are properly placed.
- B. Before installation, examine rough-in and built-in construction for piping systems to verify actual locations of piping connections.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.
- B. Build chases and recesses to accommodate items specified in this and other Sections.
- C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.
- D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.
- E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures. Cull oddly colored, textured or damaged units. Absolutely no staining of masonry will be allowed.
1. Mix units from several pallets or cubes as they are placed.
- F. Wetting of Brick: Wet brick before laying if initial rate of absorption exceeds 30 g/30 sq. in. per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at time of laying.

3.3 TOLERANCES

- A. Dimensions and Locations of Elements:
1. For location of elements in plan do not vary from that indicated by more than plus or minus 1/4 inch.
 2. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch (6 mm) in a story height or 1/2 inch (12 mm) total.
- B. Lines and Levels: Comply with ACI 530.1/ASCE 6/TMS 602 and with the following.
1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/8 inch in 10 feet, or 1/4 inch maximum.
 2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet or 1/2 inch (12 mm) maximum.
 3. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet or 1/2 inch maximum.
 4. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet or 1/2 inch maximum.

5. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch, with a maximum thickness limited to 1/2 inch .
2. For exposed bed joints, do not vary from bed-joint thickness of adjacent courses by more than 1/16 inch .
3. 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 1/16 inch.]
4. For exposed bed joints and head joints of stacked bond, do not vary from a straight line by more than 1/16 inch from one masonry unit to the next.

D. Cracks and Chips. This requirement shall apply to all masonry construction

1. For the allowable percentage of exposed brick and block allowed in the wall, chips shall be limited to that size able to be completely covered by a \$.10 U.S. Dime in CMU and limited to 1/4" by 1/4" square in all brick. No other chips are allowed
2. For the allowable percentage of exposed brick and block allowed in the wall, surface cracks shall be limited to 1.5" in length and no wider than 1/16" in CMU and 1/2" in length and no wider than 1/16" in brick. Any cracks extending through the brick or block shall not be acceptable. No other cracks are allowed

3.4 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 Masonry: Unless otherwise indicated, lay exposed concrete masonry in, **running bond, lay exposed brick and split face block masonry in running bond**. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.
- C. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.
- D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
- E. Fill space between steel frames and masonry solidly with mortar.
- F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, in the joint below and rod mortar or grout into core.
- G. Fill cores in hollow CMUs with grout 24 inches under bearing plates, beams, lintels, posts, and similar items unless otherwise indicated.
- H. Build non-load-bearing interior partitions to heights indicated on drawings.
 1. Install compressible filler in joint between top of partition and underside of structure above.

2. Fasten partition top anchors to structure above as required by structural documents.
3. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with referenced UL design assembly.

3.5 MORTAR BEDDING AND JOINTING

- A. Lay hollow brick and CMUs as follows:
 1. With face shells fully bedded in mortar and with head joints fully bedded.
- B. Lay solid masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.
 1. Do not wet CMU's before laying.
- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated. Do not leave finger joints.
 1. Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints.

3.6 CAVITY WALLS

- A. Bond wythes of cavity walls together.
 - a. Where one wythe is of clay masonry or split face block and the other of concrete masonry, use adjustable (two-piece) type reinforcement with continuous horizontal wire in facing wythe attached to ties to allow for differential movement regardless of whether bed joints align.
- B. Keep cavities clean of mortar droppings and other materials during construction. Bevel beds away from cavity, to minimize mortar protrusions into cavity. Do not attempt to trowel or remove mortar fins protruding into cavity.
- C. Dampproofing: Apply asphalt emulsion dampproofing to exterior side of C.M.U. surfaces as recommended by manufacturer. Product shall be equal to Karnak 220 AF. Products of equal quality will be acceptable with prior approval. Remove all excess mortar from block face and from reinforcement prior to application of dampproofing.
- D. Installing Cavity-Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.
 1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.7 MASONRY-CELL INSULATION

- A. Fill all exterior CMU wall cells with the specified foam insulation product. Inject foam into block cells from holes drilled in concealed spaces above the ceiling. Patch all holes once cells are completely filled. Follow all manufacturers instructions to ensure that all cells are filled.

3.8 MASONRY JOINT REINFORCEMENT

- A. General: Install as indicated on structural documents.

3.9 ANCHORING MASONRY TO STRUCTURAL STEEL AND CONCRETE

- A. Anchor masonry to structural steel and concrete where masonry abuts or faces structural steel or concrete to comply with the following:
 - 1. Provide an open space not less than 1 inch wide between masonry and structural steel or concrete unless otherwise indicated. Keep open space free of mortar and other rigid materials.
 - 2. Anchor masonry with anchors embedded in masonry joints and attached to structure.
 - 3. Space anchors as indicated, but not more than 16 inches o.c. vertically and 24 inches o.c. horizontally with not less than 1 anchor for each 2 of wall area. .

3.10 ANCHORING MASONRY VENEERS

- A. Anchor masonry veneers to wall framing with masonry-veneer anchors to comply with the following requirements:
 - 1. Fasten screw-attached anchors through sheathing to wall framing with metal fasteners of type indicated. Use two fasteners unless anchor design only uses one fastener.
 - 2. Embed tie sections in masonry joints. Provide not less than 2 inches (50 mm) of air space between back of masonry veneer and face of sheathing.
 - 3. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
 - 4. Space anchors as indicated, but not more than 16 inches o.c. vertically and 24 inches (o.c. horizontally, with not less than 1 anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 8 inches, around perimeter.
- B. Anchor masonry veneers to masonry backup with 2- piece (hook and eye) masonry-veneer anchors to comply with the following requirements:
 - 1. Embed tie sections in masonry joints. Provide not less than 2 inches (50 mm) of air space between back of masonry veneer and face of sheathing.
 - 2. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
 - 3. Space anchors as indicated, but not more than 16 inches o.c. vertically and 24 inches o.c. horizontally, with not less than 1 anchor for each 2 sq. ft. of wall area. Install additional anchors within 12 inches of openings and at intervals, not exceeding 8 inches around perimeter.
 - 4. Care shall be taken not to bend or otherwise deform any component of the masonry anchors.

3.11 CONTROL AND EXPANSION JOINTS

- A. General: Install control and expansion joint materials in unit masonry as masonry progresses. Do not allow materials to span control and expansion joints without provision to allow for in-plane wall or partition movement.
- B. Form control joints in concrete masonry using one of the following methods:
 - 1. Install preformed control-joint gaskets designed to fit standard sash block.

- C. Form expansion joints in brick as follows:
 - 1. Build flanges of metal expansion strips into masonry. Lap each joint 4 inches (100 mm) in direction of water flow. Seal joints below grade and at junctures with horizontal expansion joints if any.
 - 2. Form open joint full depth of brick wythe and of width indicated, but not less than 3/8 inch for installation of sealant and backer rod.
- D. Provide horizontal, pressure-relieving joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Section 079200 "Joint Sealants," but not less than 3/8 inch.
 - 1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry.

3.12 LINTELS

- A. Install steel lintels where indicated.
- B. Provide masonry lintels where shown
- C. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.13 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

- A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, door & window openings, other openings, other obstructions to downward flow of water in wall, and where indicated. Install vents at all areas to receive flashing.
- B. Install flashing as follows unless otherwise indicated:
 - 1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
 - 2. At multiwythe masonry walls, including cavity walls, extend flashing through outer wythe, turned up a minimum of **6 inches above cavity drainage material**, and through inner wythe for a distance of 3".
 - 3. At masonry-veneer walls, extend flashing through veneer, across air space behind veneer, and up face of sheathing at least 6 inches above cavity drainage material with upper edge firmly secured to sheathing with termination bar. Ensure that moisture barrier completely covers the joint between the flashing and sheathing.
 - 4. At lintels and shelf angles, extend flashing a minimum of 6 inches into masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
 - 5. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal drip edge.
- C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.
- D. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:

1. Use specified weep/vent products to form weep holes.
 2. Space weep holes 24 inches o.c. unless otherwise indicated.
- E. Place cavity drainage material in cavities to comply with configuration requirements for cavity drainage material.

3.14 REINFORCED UNIT MASONRY INSTALLATION

- A. Temporary Formwork and Shores: Construct formwork and shores as needed to support reinforced masonry elements during construction.
1. Construct formwork to provide shape, line, and dimensions of completed masonry as indicated. Make forms 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 loads that may be placed on them during construction.
- B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6/TMS 602.
- C. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.
1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.
 2. Limit height of vertical grout pours to not more than 60 inches.

3.15 FIELD QUALITY CONTROL

- A. Testing and Inspecting: Owner will engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Contractor's expense.

3.16 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. 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 Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.

3.17 MASONRY WASTE DISPOSAL

- A. Salvageable Materials: Unless otherwise indicated, excess masonry materials are Contractor's property. At completion of unit masonry work, remove from Project site.

END OF SECTION 04200

SECTION 04732 - MANUFACTURED STONE MASONRY

1 General

1.1 SECTION INCLUDES

- .1 Calcium silicate masonry units.

1.2 RELATED SECTIONS

- .1 Section 04200 Masonry

1.3 REFERENCES

- .1 IBC 2018: Building Code Requirements for Masonry Structures.

1.4 SAMPLES

- .1 Submit samples for each product specified.
- .2 Samples: Three full size sample, illustrating color and texture.

1.5 TEST REPORTS

- .1 Test Reports: Test results prepared by an independent testing agency, indicating tested material characteristics as part of a source quality control program, current within the past five (5) years.

1.6 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Manufacturer having sufficient plant facilities to produce the shapes, quantities and size of Products required in accordance with the project schedule.
- .2 Installer: Company or person specializing in commercial masonry work with minimum five years documented experience.
- .3 Mock-up: Supply sufficient quantity of full size calcium silicate masonry units for use in constructing mock-up panel, as specified in Section 04200.

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver calcium silicate masonry units in protective film. Prevent damage to units.
- .2 Lift skids with proper and sufficiently long slings or forks with protection to prevent damage to units. Protect edges and corners.
- .3 Store units in a manner designed to prevent damage and staining of units.
- .4 Stack units on timbers or platforms at least 3 inches above grade.

- .5 Place polyethylene or other plastic film between wood and other finished surfaces of units when stored for extended periods of time.
- .6 Cover stored units with protective enclosure if exposed to weather.
- .7 Do not use salt or calcium-chloride to remove ice from masonry surfaces.

1.8 ENVIRONMENTAL REQUIREMENTS

- .1 Conform to requirements of TMS 602, PART 1.8.

2 Products

2.1 MANUFACTURERS

- .1 Manufacturers of calcium silicate masonry units having Products considered acceptable for use:
 - .1 Basis of Design – Arriscraft.
- .2 Substitution Procedures: Refer to Section 00020.

2.2 MATERIALS

- .1 Calcium Silicate Masonry Units (Georgia): to ASTM C73, Grade SW; solid units that have been pressure formed and autoclaved; 3-5/8" bed depth; special shapes as indicated; and as follows:
 - .1 Modular Size: 7-5/8 high, 23-5/8" long. Provide special shape at corners, jambs, etc to satisfy project requirements.
 - .2 Texture: satin on exposed faces and ends.
 - .3 Color: Color as selected by Architect.
 - .4 Product and Manufacturer's Name: Renaissance Masonry Units by Arriscraft.
- .2 Mortar: 1:1:6 Portland cement-hydrated lime-sand mix, as specified in Section 04200.
- .3 Grout: maximum 6,500 psi at 28 days, as specified in Section 04200.
- .4 Wall Ties and Anchorages: as specified in Section 04200.
- .5 Joint Sealants and Backer Rods: non-staining type, as specified in Section 07900.
- .6 Flashing, Vents, and Masonry Accessories: as specified in Section 4200.

2.3 FABRICATION TOLERANCES

- .1 Fabricate calcium silicate masonry units to the following tolerances:
 - .1 Unit Length: plus or minus 1/16".
 - .2 Unit Height: plus or minus 1/16".
 - .3 Deviation From Square: plus or minus 1/16", with measurement taken using the longest edge as the base.
 - .4 Bed Depth: plus or minus 1/8".

.5 Custom Unit Dimensions: plus or minus 1/8".

2.4 SOURCE QUALITY CONTROL

- .1 Test calcium silicate masonry units as with manufacturer's referenced standards.
- .2 Test compressive strength and absorption from specimens selected at random from plant production.

3 Execution

3.1 EXAMINATION

- .1 Verify site conditions are ready to receive work.
- .2 Inspect materials for fit and finish prior to installation. Do not set unacceptable units.
- .3 Beginning of installation means acceptance of existing conditions.

3.2 CUTTING MASONRY UNITS

- .1 Cut masonry units with wet-saw.
- .2 Pre-soak units using clean water prior to cutting.
- .3 Clean cut units using a stiff fibre brush and clean water. Allow units to surface dry prior to placement.
- .4 Finish cut edges to match face when exposed in wall.

3.3 WETTING MASONRY UNITS

- .1 Where the ambient air temperature exceeds 100°F or exceeds 90°F with a wind velocity greater than 8 mph, pre-wet masonry units.
- .2 Lay wetted units when surface dry.

3.4 COURSING

- .1 Place masonry to lines and levels indicated.
- .2 Maintain masonry courses to uniform width. Make vertical and horizontal joints equal and of uniform thickness.
- .3 Lay masonry units in half-running bond.
- .4 Course one masonry unit and one mortar joint to equal 8 inches.
- .4 Maintain mortar joint thickness of 3/8 inch.
- .5 Tool mortar joints by compacting the surface when thumbprint hard, to a concave finish.

3.5 PLACING AND BONDING

- .1 Lay masonry in full bed of mortar, properly jointed with other work. Buttering corners of joints, [and] deep or excessive furrowing of mortar joints [and] [] are not permitted.
- .2 Fully bond intersections, and external corners.
- .3 Do not adjust masonry units after laying. Where resetting of masonry is required, remove, clean units and reset in new mortar.
- .4 Install loose lintels as scheduled.
- .5 Install wall ties and anchorages as specified in Section 04200
- .6 Install flashings, vents, and masonry accessories as specified in Section 04200
- .7 Construct movement joints as recommended by manufacturer, specified in Section 04200 and as shown on drawings.

3.6 SITE TOLERANCES

- .1 Erect masonry within the tolerances described in TMS 602, PART 3.3F.

3.7 FIELD QUALITY CONTROL

- .1 Architect Inspection: Architect will inspect installed masonry and reject masonry that is chipped, cracked, or blemished (streaked, stained or otherwise damaged), as described below.
 - .1 Masonry will be inspected to be free of cracks or other blemishes on the finished face or front edges of the masonry units that can be seen from a distance of 20 feet.
 - .2 Units shall exhibit a texture approximately equal to the approved sample when viewed under diffused daylight illumination at a 20 foot distance.
 - .3 Minor chipping resulting from shipment and delivery shall not be grounds for rejection. Minor chips shall not be obvious under diffused daylight illumination from a 20 foot distance.
 - .4 Efflorescence will not be cause for rejection.
- .2 Replace rejected masonry as directed by Architect.

3.8 ADJUSTING AND CLEANING

- .1 Clean masonry units as recommended by manufacturer.

[OR]

- .2 Clean a 100 square foot area of wall designated by Architect as directed below and leave for one week. If no harmful effects appear, all objectionable stains removed and after mortar has set and cured, clean masonry as follows:
 - .1 Protect windows, sills, doors, trim and other work from damage.
 - .2 Remove large particles with [stiff fiber brushes] [wood paddles] without damaging surface.

- .3 Saturate masonry with clean water and flush off loose mortar and dirt.
 - .4 Dilute cleaning agent with clean water in controlled proportions.
 - .5 Apply solution to pre-soaked wall surface using soft-bristled brush.
 - .6 Thoroughly rinse cleaning solution and residue from wall surface.
- .3 Use alternative cleaning solutions and methods for difficult to clean masonry only after consultation with masonry unit manufacturer.

3.9 PROTECTION

- .1 Protect units from damage or staining resulting from subsequent construction operations.
- .2 Use protection materials and methods which will not stain or damage units.
- .3 Remove protection materials upon Substantial Performance of the Work, or when risk of damage is no longer present.

END OF SECTION

SECTION 06100 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Rooftop equipment bases and support curbs.
 - 2. Wood furring, grounds, nailers, and blocking.
 - 3. Sheathing.
 - 4. Utility shelving.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials:
 - 1. For each type of preservative-treated wood product, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
 - 2. For fire-retardant-treated wood products, include certification by treating plant that treated materials comply with specified standard and other requirements as well as data relative to bending strength, stiffness, and fastener-holding capacities of treated materials.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.
 - 1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Wood-Preservative-Treated Materials:
 - a. Baxter: J. H. Baxter Co.
 - b. Chemical Specialties, Inc.
 - c. Continental Wood Preservers, Inc.
 - d. Hickson Corp.
 - e. Hoover Treated Wood Products, Inc.
 - f. Osmose Wood Preserving, Inc.
 - 2. Gypsum Sheathing Board:

- a. Domtar Gypsum.
- b. Georgia-Pacific Corp.
- c. National Gypsum Co.; Gold Bond Building Products Division.
- d. United States Gypsum Co.

2.2 LUMBER, GENERAL

- A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.
 - 1. NELMA - Northeastern Lumber Manufacturers Association.
 - 2. SPIB - Southern Pine Inspection Bureau.
 - 3. WWPA - Western Wood Products Association.
- B. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
- C. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 - 1. Provide lumber with 15 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. General: Where lumber or plywood is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWPAC2 (lumber) and AWPAC9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.
 - 1. For exposed items indicated to receive stained finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.
- B. Pressure treat aboveground items with waterborne preservatives to a minimum retention of 0.25 lb/cu. ft. (4.0 kg/cu. m). After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 and 15 percent, respectively. Treat indicated items and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 - 3. Wood framing members less than 18 inches (460 mm) above grade.
 - 4. Wood floor plates installed over concrete slabs directly in contact with earth.
- C. Complete fabrication of treated items before treatment, where possible. If cut after treatment, apply field treatment complying with AWPAC M4 to cut surfaces. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

2.4 DIMENSION LUMBER

- A. General: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.
- B. Non-Load-Bearing Interior Partitions: Provide framing of the following grade and species:
 - 1. Grade: Standard, Stud, or No. 3.
 - 2. Species: Southern pine; SPIB.

C. Framing Other than Non-Load-Bearing Partitions: Provide framing of the following grade and species:

1. Grade: No. 2.
2. Species: Southern pine; SPIB.

2.5 MISCELLANEOUS LUMBER

- A. General: Provide lumber for support or attachment of other construction, and support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members.
- B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.
- C. Moisture Content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.
- D. Grade: For dimension lumber sizes, provide No. 3 or Standard grade lumber per ALSC's NGRs of any species. For board-size lumber, provide No. 3 Common grade per NELMA, NLGA, or WWPA; No. 2 grade per SPIB; or Standard grade per NLGA, WCLIB or WWPA of any species.

2.6 GYPSUM SHEATHING

- A. Gypsum Sheathing Board: Water-resistant-core gypsum sheathing board complying with ASTM C 79 with long edges surfaced with water-repellent paper and as follows:
1. Type: Regular.
 2. Edge Configuration: Square, for vertical application.
 3. Thickness: 1/2 inch (12.7 mm).

2.7 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel.
- B. Nails, Wire, Brads, and Staples: FS FF-N-105.
- C. Power-Driven Fasteners: CABO NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1. (ASME B18.2.3.8M)
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Discard units of material with defects that impair quality of rough carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.

- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.
- C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.
- D. Apply field treatment complying with AWPAC M4 to cut surfaces of preservative-treated lumber and plywood.
- E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with Georgia State minimum building codes.
- F. Use common wire nails, unless otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.
- G. Use hot-dip galvanized or stainless-steel nails where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity.
- H. Countersink nail heads on exposed carpentry work and fill holes with wood filler.

3.2 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

- A. Install wood grounds, nailers, blocking, and sleepers where shown and where required for screeding or attaching other work. Form to shapes shown and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

3.3 WOOD FURRING

- A. Install plumb and level with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Gypsum Board: Install 1-by-2-inch nominal- (19-by-38-mm actual-) size furring at 16 inches (406 mm) o.c., vertically.

3.4 GYPSUM SHEATHING

- A. General: Fasten gypsum sheathing to supports with galvanized roofing nails or divergent point galvanized staples. Nail or staple to comply with manufacturer's recommended spacing and referenced fastening schedule. Keep perimeter fasteners 3/8 inch (10 mm) from edges and ends of units. Fit units tightly against each other and around openings.
- B. Install 24-by-96-inch (609-by-2438-mm) sheathing horizontally with long edges at right angles to studs with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent board without forcing. Abut ends of boards over centers of studs and stagger end joints of adjacent boards not less than 1 stud spacing, 2 where possible.

END OF SECTION 06100

SECTION 07210 - BUILDING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Concealed building insulation.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Section 07220
 - 2. Section 07221
 - 3. Section 04200 for additional requirements

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of insulation product specified.

1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility for Insulation Products: Obtain each type of building insulation from a single source with resources to provide products complying with requirements indicated without delaying the Work.
- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated on Drawings or specified elsewhere in this Section as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering insulation products that may be incorporated in the work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide insulation products by one of the following:

1. Glass-Fiber Insulation:
 - a. CertainTeed Corporation.
 - b. Knauf Fiber Glass GmbH.
 - c. Owens-Corning Fiberglas Corporation.
 - d. Schuller International, Inc.
 - e. Johns-Manville.

2.2 INSULATING MATERIALS

- A. General: Provide insulating materials that comply with requirements and with referenced standards.
 1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thicknesses, widths, and lengths.
- B. Faced Mineral-Fiber Blanket Insulation: Thermal insulation combining mineral fibers of type described below with thermosetting resins to comply with ASTM C 665, Type III, Class A (blankets with reflective vapor-retarder membrane facing and flame spread of 25 or less);
- C. Unfaced, Mineral-Wool Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics. Provide with maximum recycled content available.

2.3 AUXILIARY INSULATING MATERIALS

- A. Adhesive for Bonding Insulation: Product with demonstrated capability to bond insulation securely to substrates indicated without damaging insulation and substrates.
- B. Protection Board: Premolded, semirigid asphalt/fiber composition board, 1/4 inch (6 mm) thick, formed under heat and pressure, standard sizes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements of Sections in which substrates and related work are specified and to determine if other conditions affecting performance of insulation are satisfactory. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or that interfere with insulation attachment.

3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- B. Install insulation that is undamaged, dry, unsoiled, and has not been exposed at any time to ice and snow.
- C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

- D. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

3.4 INSTALLATION OF GENERAL BUILDING INSULATION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Seal joints between closed-cell (nonbreathing) insulation units by applying adhesive, mastic, or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic, or sealant as recommended by insulation manufacturer.
- C. Set vapor-retarder-faced units with vapor retarder to warm side of construction, unless otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.
 - 1. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
 - 2. Use blanket widths and lengths that fill cavities formed by framing members. Where more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
 - 3. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

3.5 PROTECTION

- A. General: Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07210

SECTION 07221 - METAL ROOF INSULATION

PART 1 - GENERAL

1.1 SCOPE OF WORK

- A. Provide all labor, equipment, and materials to install roof insulation over the properly prepared deck substrate.

1.2 RELATED SECTIONS

- A. Drawings and general provisions of the Contract, including General Supplementary Conditions and Division 1 Specification Sections apply to this section.
- B. Related work specified elsewhere:
 - 1. Division 7 Section "Standing seam roof panels."
 - 2. Division 7 Section "Flashing and Sheet Metal."
 - 3. Division 7 Section "Roof Specialty and Accessory Items."

1.3 REFERENCES

ASTM A-167-94a	Specification for Stainless and Heat-Resisting Chromium Nickel Steel Plate, Sheet and Strip
ASTM A-653	Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process
ASTM B-29	Pig Lead
ASTM B-32	Solder Metal
ASTM C-165-95	Test Method for Measuring Compressive Properties of Thermal Insulation
ASTM C-208-95	Specifications for Cellulosic Fiber Insulating Board
ASTM C-209-92	Test Method for Cellulosic Fiber Insulating Board
ASTM C-272-91	Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions
ASTM C-36	Specification for Gypsum Wallboard
ASTM C-518-91	Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
ASTM C-578-92	Specification for Rigid, Cellular, Polystyrene Thermal Insulation
ASTM C-728-91	Specification for Perlite Thermal Insulation Board
ASTM D-5	Test Method for Penetration of Bituminous Materials
ASTM D-36	Test Method for Softening Point of Bitumen (Ring and Ball Apparatus)
ASTM D-312	Specification for Asphalt Used in Roofing
ASTM D-412-92	Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension
ASTM D-1621-94	Test Method for Compressive Properties of Rigid Cellular Plastics
ASTM D-1622	Test Method for Apparent Density of Rigid Cellular Plastics
ASTM D-1863	Specification for Mineral Aggregate Used on Built-Up Roofs
ASTM D-2126-94	Test Method for Response of Rigid Cellular Plastics to Thermal Humid Aging
ASTM D-2178	Standard Specification for Asphalt Glass Felts used in Roofing and Waterproofing
ASTM D-4601-94	Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing
ASTM D-5147	Sampling and Testing Modified Bituminous Sheet Material
CISPI	Cast Iron Soil Pipe Institute, Washington, D.C.
FM	Factory Mutual System, Norwood, Massachusetts

NRCA	National Roofing Contractors Association, Chicago, IL
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SDI	Steel Deck Institute, St. Louis, Missouri
SPIB	Southern Pine Inspection Bureau, Pensacola, Florida
UL	Underwriter's Laboratories, Inc., Northbrook, Illinois
FS HH-I-1972	Insulation Board, Polyisocyanurate
FS LLL-1-535B	Insulation Board, Thermal (Fiberboard)
WH	Warnock Hersey International, Inc., Middletown, Wisconsin

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300 - Submittals.
- B. Product Data: Provide manufacturer's specification data sheets for each product in accordance with Section 01330.
- C. Provide approval letters from insulation manufacturer for use of their insulation within this particular roofing system type.
- D. Provide a sample of each insulation type.
- E. Shop Drawings
 - 1. Submit manufacturer's shop drawings indicating complete installation details of insulation system, including identification of each insulation block, sequence of installation, layout, roof slopes, thicknesses, crickets and saddles.
 - 2. Shop drawing shall include: Outline of roof, Roof slope, complete board layout of insulation components, thickness and the average "R" value for the completed insulation system.
- F. Certification
 - 1. Submit roof manufacturer's certification that insulation fasteners furnished are acceptable to roof manufacturer.
 - 2. Submit roof manufacturer's certification that insulation furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.
 - 3. Submit certification that insulation and fastening system furnished is Tested and Approved by Factory Mutual for 1-90 Wind Up-Lift Requirements.

1.5 QUALITY ASSURANCE

- A. Fire Classification, ASTM E-108
- B. Submit certification that the roof system furnished is approved by Factory Mutual, Underwriters Laboratories or Warnock Hersey for external Fire E-108 Class 1A and that the roof system is adhered properly to meet or exceed 1-90.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.

- B. Store all insulation materials in a manner to protect them from the wind, sun and moisture damage prior to and during installation. Any insulation that has been exposed to any moisture shall be removed from the project site.
- C. Keep materials enclosed in a watertight, ventilated enclosure (i.e. tarpaulins).
- D. Store materials off the ground. Any warped, broken or wet insulation boards shall be removed from the site.

PART 2 - PRODUCTS

2.1 APPROVED EQUIVALENT

- A. Contractor must submit any product not specified a minimum five days before the bid date to Architect in order for product to be considered for approval. The Architect will notify Contractor in writing of decision to accept or reject request.

2.2 INSULATION MATERIALS

- A. Provide thicknesses of insulation as indicated, provide combination of types and thicknesses to provide a complete system.

1. RIGID POLYISOCYANURATE ROOF INSULATION

- a. Metal Roof Insulation Qualities: Rigid, closed cell Polyisocyanurate foam core with radiant barrier quality reinforced aluminum foil facers on both sides. Tape all seams with foil tape by same manufacturer. MUST MEET CURRENT IECC W GEORGIA AMENDMENTS.

- 1. Thickness: Per manufacturer.
- 2. R-Value: Minimum 30.0

b. Source

- 1. E'NRG'Y-2 By NRG Barriers, Inc.
- 2. Ultra Gard Gold II by Schuller Roofing Systems
- 3. GAFTEMP Isotherm R by GAF
- 4. Johns Manville.
- 5. Atlas Roofing Corp. – AC Foam Supreme
- 6. R-Max – Multimax FA
- 7. Dow – Tuff-R

2. Insulation board shall meet the following requirements

- 1. UL, WH or FM listed under Roofing Systems
- 2. Federal Specification HH-I-1972, Class 1

3. Physical Properties

Dimensional Stability ASTM D-2126 2% max.

Compressive Strength ASTM D-1621 25 psi min.

Vapor Permeability ASTM E-96 1 perm max.

Foam Core Density ASTM D-1622 2.0 pcf min.

Water AbsorptionASTM C-209 <1%

2.3 RELATED MATERIALS- where applicable

- A. Fiber Cant and Tapered Edge Strips: Performed rigid insulation units of sizes/shapes indicated, matching insulation board or of perlite or organic fiberboard, as per the approved manufacturer.
 - 1. Acceptable Manufacturers
 - a. Celotex
 - b. Johns Manville
 - c. International Permalite, Inc.
 - d. Approved Equivalent
- B. Protection Board: Premolded semi-rigid asphalt composition board ½ in.
- C. Roof Board Joint Tape: 6” wide glass fiber mat with adhesive compatible with insulation board facers.
- D. Asphalt: ASTM D-312, Type III Steep Asphalt.
- E. Metal Deck Foam Adhesive: Type recommended by insulation manufacturer and approved by FM and UL for indicated ratings.
- F. Fasteners
 - 1. Corrosion resistant screw fastener as recommended by roof membrane manufacturer.
 - 2. Factory Mutual Tested and Approved with 3 in. coated disc for 1-90 rating, length required to penetrate metal deck one inch.
 - 3. Minimum pull out resistance of 800 lbs.

PART 3 - EXECUTION

3.1 INSPECTION OF SURFACES

- A. Roofing contractor shall be responsible for preparing an adequate substrate to receive insulation.
 - 1. Verify that work which penetrates roof deck has been completed.
 - 2. Verify that wood nailers are properly and securely installed.
 - 3. Examine surfaces for defects, rough spots, ridges, depressions, foreign material, moisture, and unevenness.
 - 4. Do not proceed until defects are corrected.
 - 5. Do not apply insulation until substrate is sufficiently dry.
 - 6. Broom clean substrate immediately prior to application.
 - 7. Use additional insulation to fill depressions and low spots that would otherwise cause ponding water.
 - 8. Verify that temporary roof has been completed.

3.2 INSTALLATION

- A. Attachment with Mechanical Fasteners.
 - 1. This is for the areas of that have slope metal decking. Approved polyisocyanurate insulation board shall be fully attached to the deck with an approved mechanical

fastening system. As a minimum, the amount of fasteners shall be in accordance with manufacturer's recommendation for FM 1-90 approved system.

2. Filler pieces of insulation require at least two fasteners per piece if size of insulation is less than four square feet.
3. Spacing pattern of fasteners shall be as per manufacturer's recommendations to meet the FM requirements. Placement of any fastener from edge of insulation board shall be a minimum of three inches, and a maximum of six inches.
4. Minimum penetration into deck shall be as recommended by the fastener manufacturer. There is a one inch (1") minimum for metal, wood and structural concrete decks where not specified by the manufacturer.

3.3 CLEANING

- A. Remove debris and cartons from roof deck. Leave insulation clean and dry, ready to receive roofing membrane.

END OF SECTION

SECTION 07410 – COMPOSITE METAL WALL PANEL SYSTEM

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Metal-faced composite wall panels and related components.
- B. Related Sections include the following:
 - 1. Division 5 Section “Cold-Formed Metal Framing” for secondary support framing supporting metal wall panels.
 - 2. Division 7 Section “Joint Sealants” for field-applied sealants not otherwise specified in this Section.
 - 3. Division 7 Section 7240 for vapor barrier and/or moisture barrier.

1.3 DEFINITIONS

- A. Metal Wall Panel Assembly: Metal wall panels, attachment system components and accessories necessary for a complete weathertight system.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide metal wall panel assemblies that comply with performance requirements specified as determined by testing manufacturers’ standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.
- B. Air Infiltration: Air leakage through assembly of not more than 0.06 cfm/sq.ft. of wall area when tested according to ASTM E 283 at a static-air-pressure difference of 6.24 lbf/sq.ft.

- C. Water Penetration: No water penetration when tested according to ASTM E 331 at a wind-load design pressure of not less than 15 psf.
- D. Structural Performance: Provide metal wall panel assemblies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 330-84:
 - 1. Wind Loads: Determine loads based on the following minimum design wind pressures:
 - a. Uniform pressure of 30 psf, inward or outward.
 - 2. Deflection Limits: Engineer metal wall panel assemblies to withstand test pressures with deflection no greater than 1/180 of the span and no evidence of material failure, structural distress, or permanent deformation exceeding 0.2 percent of the clear span.
- E. Large Missile Impact: ASTM E 1996-03. Provide metal panel system which has passed ASTM E 1996-03 without penetration. Panel system shall have achieved “pass” status without the use of supplemental materials such as plywood or panel stiffeners.
- F. Fire-Resistance Ratings: Where indicated, provide metal wall panels identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Combustion Characteristics: ASTM E 136.
- G. Surface-Burning Characteristics: Provide insulated metal wall panels having insulation-core materials with the following surface-burning characteristics as determined by testing identical products per ASTM E 84 under UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. FR Core:
 - a. Flame-Spread Index: 0
 - b. Smoke-Developed Index: 10

1.5 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal wall panel and accessory.

- B. Shop Drawings: Show fabrication and installation layouts of metal wall panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details.
1. Accessories: Include details of all integral panel components and their interface with adjacent materials.
 2. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Samples for Initial Selection: For each type of metal wall panel indicated with factory-applied color finishes.
1. Include manufacturer's standard color charts consisting of strips of cured sealants showing the full range of colors available for each sealant exposed to view .
 2. Include manufacturer's standard color charts showing full range of colors available to include metallic and mica finishes, in specified finish type, for the metal panel system.
- D. Samples for Verification:
1. Metal Wall Panels: Two (2) each, six inches by ten inches minimum, panel samples with joinery included as part of the sample.
 2. Accessories: Twelve-inch long samples for each type of accessory.
 - 3.
- E. 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.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for the following:
1. Metal Panels: Include reports for air infiltration, water penetration, structural performance, and Large Missile Impact.
- G. Maintenance Data: For metal wall panels to include in maintenance manuals.
- H. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

A. Panel System Fabricator:

1. System Fabricator's responsibilities include engineering and fabricating metal wall panel assemblies and when required, provide professional engineering services needed to assume engineering responsibility.
2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by the fabricator, not a subcontractor.
3. Field Measurements: Verify actual supporting and adjoining construction by field measurements before fabrication, and indicate recorded measurements on final shop drawings. Coordinate construction to ensure that wall panel assemblies fit properly to supporting and adjoining construction and coordinate schedule with construction progress to avoid delaying the work

B. Fabrication Location: Panels to be factory assembled at Fabricator's plant/shop. Panels shall not be assembled on-site.

C. Installer: Must be certified by metal-faced composite wall panel Fabricator to install Fabricator's wall panel system.

D. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated, as documented according to ASTM E 548.

E. Source Limitations: Obtain each type of metal wall panel through one source from a single fabricator.

F. Product Options: Drawings indicate size, profiles, and dimensional requirements of metal wall panels and are based on the specific system indicated.

G. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination". Review methods and procedures related to metal wall panel assemblies including, but not limited to, the following:

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, metal wall panel installer, metal wall panel fabricator's representative, structural-support installer, and installers whose work interfaces with or affects metal wall panels including installers of doors, windows, and louvers.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment and facilities needed to make progress and avoid delays.
3. Review methods and procedures related to metal wall panels installation, including fabricator's written instructions.

4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that will affect metal wall panels.
6. Review governing regulations and requirements for insurance, certificates, and testing and inspecting if applicable.
7. Review temporary protection requirements for metal wall panel assembly during and after installation.
8. Review wall panel observation and repair procedures after metal wall panel installation.
9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, metal wall panels, and other manufactured items so as not to be damaged or deformed. Package metal wall panels for protection during transportation and handling.
- B. Unload, store, and erect metal wall panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal wall panels on platforms, pallets, or within crates, covered with suitable weathertight and ventilated covering. Store metal wall panels to ensure dryness, with positive slope for drainage of water. Do not store metal wall panels in contact with other materials that might cause staining, denting, or other surface damage.
- D. Leave protective strippable film as applied by MCM sheet manufacturer on panel face throughout fabrication and installation. Remove only after panels are installed and not subject to damage.

1.8 PROJECT CONDITIONS

- A. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before metal wall panel fabrication.

1.9 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal wall panel assemblies that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures, including rupturing, cracking, or puncturing.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2. Warranty Period: Ten (10) years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal wall panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: Twenty (20) years from date of Substantial Completion.

PART 2 – PRODUCTS

2.1 MANUFACTURER: MCM – METAL COMPOSITE MATERIAL

- A. Alpolic
- B. Reynobond
- C. Alucobond

2.2 FABRICATOR: PANEL SYSTEM

- A. The following requirements apply for product selection:
 - 1. Basis of Design-ALTECH Panel Systems (678-721-4569): Accu-Trac® ES
 - 2. Firestone/ UNACLAD
 - 3. Centria Formabond
 - 4. Peachtree Protective Covers

2.3 PANEL MATERIALS

A. Composite Metal Panel System

1. Exposed Sealant System (ES)

- a. Panel system shall be nominal two-inch depth with shop applied, concealed continuous perimeter extrusions. (Note: Intermittent extrusions at panel perimeter are not acceptable.) Panel system shall employ shop attached clips with sliding capability for exact location over supports, while allowing for thermal movement. To minimize thermal stresses on the panels, fixed attachment type clips will not be acceptable.
- b. Panel system shall have nominal 1/2" vertical and horizontal joinery. Sealant color shall be Dow 795 Silicone or approved equal
- c. Panel system shall be fabricated in a shop environment. Field assembled systems are not be permissible.
- d. Panel system shall be provided in panel modules and lengths as indicated on the Contract drawings.
- a. Panel system to be applied over properly installed vapor and/or moisture barrier. See Section 07240.

B. MCM – Metal Composite Material: Formed with 0.020-inch of 3105 H25 aluminum alloy coil-coated aluminum sheet facings. MCM sheets to be formed in a continuous, in-line process utilizing thermoset adhesive and pressure to achieve the following minimum bond strength between the metal facings and the core: Aluminum composite material shall be composed of a thermoplastic core sandwiched between two aluminum sheets formed in a continuous process with no applied glues or adhesives. Honeycomb type cores will not be accepted.

C.

1. MCM Thickness: 0.157 inch (4 mm).
2. Core: Fire Retardant 4mm PE core (FR).
3. Bond Strength: (ASTM C297): 427 psi (FR core)
4. Finish shall consist of a 70% fluoropolymer resin that complies with AAMA 2605 standards. Finish to be selected from manufacturer's full range of colors to include metallic and mica finishes.

2.4 ACCESSORIES

- ### A. Wall Panel Accessories: Provide components required for a complete metal wall panel assembly including trim, copings, fasciae, splines, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels, unless otherwise indicated.

2.5 FABRICATION

- A. General: Fabricate and finish metal wall panels and accessories at the factory to greatest extent possible, by fabricator's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
 - 1. Form panel lines, breaks and angles to be sharp and true, with surfaces free from warp and buckle.
- B. Fabricate metal wall panels in a manner that would weep any possible condensation to the exterior.
- C. Provide panel profile for full length of panel.
- D. Fabricate metal wall panel joints in a manner that will minimize noise from movements within panel assembly.
- E. Metal-Faced Composite Wall Panels:
 - 1. Fabricate panels, as required to comply with deflection limits, without the use of backside panel stiffeners.
 - 2. Fabricate panels with sharply cut edges, with no displacement of face sheets or external exposure of core material.
 - 3. Dimensional Tolerances:
 - a. Length: Plus 0.375 inch (9.5 mm).
 - b. Width: Plus 0.188 inch (4.8 mm).
 - c. Thickness: Plus or minus 0.008 inch (0.2 mm).
 - d. Panel Bow: 0.8 percent maximum or panel length or width.
 - e. Squareness: 0.2 inch (5 mm) maximum.

2.6 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal wall panel supports, and other conditions affecting performance of work.

1. Examine primary and secondary wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
 2. Examine solid wall sheathing to verify that sheathing joints are supported by framing or blocking and that installation is within flatness tolerances required by metal wall panel manufacturer.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 COMPOSITE WALL PANEL INSTALLATION, GENERAL

- A. General: Install metal wall panels in orientation, sizes, and locations indicated on approved shop drawings. Install panels perpendicular to girts and subgirts, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
- B. Install attachment system required to support wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, panel clips, and anchor channels as may be required.
1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.
 2. Do not begin installation until water barrier and flashings that will be concealed by composite panels are installed.
- C. Clip Installation: Attach integral panel clips to supports at locations, spacings, and with fasteners recommended by system fabricator. Panel clips to be attached to panels at the factory in lieu of field applied.
1. For ES System Only: Seal horizontal and vertical joints between adjacent panels with sealant backing and sealant. Install sealant backing and sealant according to requirements specified in Division 7 Section "Joint Sealants".

3.3 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align metal wall panel units within installed tolerance of 1/4-inch in 20-feet (6-mm in 6-m), non accumulative, on level, plumb, and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.4 CLEANING AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal wall panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal wall panel installation, clean finished surfaces as recommended by metal wall panel manufacturer. Maintain in a clean condition during construction.

END OF SECTION 07412

SECTION 07411 - ARCHITECTURAL METAL ROOF PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Work Included: The contractor shall provide all material, labor, administration and other items necessary to provide a complete architectural structural batten standing seam metal roof system complying with performance requirements indicated and capable of withstanding structural movement, thermally induced movement and exposure to weather without failure or infiltration of water into the building interior.
- B. Coordinate architectural standing seam metal roof system with roofing substructure work.
- C. Documents affecting work of this section include, but are not necessarily limited to, General Conditions, Supplementary General Conditions, and Sections in Division 1 of these Specifications.
- D. One Manufacturer shall provide all work associated this section and section 07415 - Preformed Metal Wall panel system

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Preformed and prefinished manufacturer's fully engineered architectural standing seam metal roof system with continuous interlocking seams, concealed clips and fastening devices.
 - 2. Color coordinated ridge, hip, valley, gable, eave, corner, rake, headwall, counter flashings and miscellaneous flashings, attaching devices, gutters and downspouts.
 - 3. Provide concealed clips, fasteners, metal closures, factory and field applied sealants as necessary to meet design criteria and ensure a weather tight installation.
 - 4. Bituthane membrane underlayment.
- B. Related Sections include the following:
 - 1. Division 1 Section "Alternates" for description of alternates related to the metal roof system.
 - 2. Division 5 Section "Steel Deck" for steel roof deck supporting metal roof panels.
 - 3. Division 5 Section "Cold-Formed Metal Framing" for secondary support framing supporting metal roof panels
 - 4. Division 6 Section "Rough Carpentry" for nailers and miscellaneous blocking.
 - 5. Division 7 Section "Metal Wall Panels" for factory-formed metal wall and soffit panels
 - 6. Division 7 Section "Metal roof insulation
 - 7. Division 7 Section "Sheet Metal Flashing and Trim" for copings, flashings and other sheet metal work not part of the architectural standing seam metal roof system.
 - 8. Division 7 Section "Joint Sealants" for field-applied sealants not otherwise specified in this Section.

1.3 5. DEFINITIONS

- A. Architectural Standing Seam Metal Roof System Assembly: Metal roof panels, attachment system components, miscellaneous metal framing, thermal insulation, underlayment, gutters, downspouts and accessories necessary for a complete weather tight roofing system.

1.4 SYSTEM DESCRIPTION

- A. DESIGN REQUIREMENTS:
 - 1. The architectural standing seam metal roof system, including: panels, flashings, attachment clips and attachment screws shall be designed by the standing seam metal roof system manufacturer to meet the local building code. The design criteria shall include the following:
 - a. Listing of applicable loads.
 - b. Listing of the building importance factor (life safety factor).
 - c. Design wind speed.

- d. Building exposure factor.
 - e. Other necessary criteria.
 - 2. The architectural standing seam metal roof manufacturer shall provide an engineered analysis of the roofing system assembly, sealed by a registered professional Engineer employed by the manufacturer, verifying that the product and attachment methods will resist wind pressures imposed upon it pursuant to the applicable building codes and that the standing seam metal roof system fully complies with all specified requirements.
 - 3. The architectural standing seam metal roof system shall bear fully documented proof that it has been independent laboratory evaluated using the U.S. Army Corps of Engineers Guide Specification (CEGS) 07416.
 - a. "Proof" shall be defined as both the manufacturer and the product being included in the document entitled, "List of Approved Standing Seam Metal Roof Systems" as published by the U.S. Corps of Engineers.
 - 4. Provide UL-90 rated roofing panels that have been tested in accordance with UL 580 protocol.
 - 5. Provide factory preformed architectural standing seam metal roofing system that has been pretested and certified by the manufacturer to comply with specified requirements under installed conditions.
 - 6. Provide one-piece, single length roof panels without need for interior laps or splices.
 - 7. Provide continuously interlocking architectural standing seam metal roofing panels that inherently increases load span capability, stiffness and flexural stress handling capacity.
 - 8. Provide architectural standing seam metal roof panel capable of spanning 3'-0" spacing and maintaining a UL 90 wind uplift rating.
 - 9. Provide continuous factory installed hot melt butyl sealant within the confines of the architectural standing seam metal roofing panel female rib. Loose gaskets and field applied panel sealants are unacceptable.
 - 10. Provide factory preformed architectural standing seam roof panels that have been tested and approved for a Class 4 Impact (Hail) resistance rating per UL 2218. Listing shall be present on the Underwriters Laboratories website.
 - 11. On-site, mechanically seamed or field roll formed panels are not acceptable.
- D. Thermal Movement: Provide metal roof panel assemblies that allow for thermal movement resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss. Exposed fasteners in roofing panels are not permitted.
- 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F at material surfaces.
- E. Structural Requirements:
- 1. Panel structural properties determined in accordance with latest edition of American Iron and Steel Institute's "Cold Formed Steel Design Manual" using "effective width" concepts.
 - 2. Wind uplift design for roof assemblies shall be calculated by the architectural standing seam metal roof system manufacturer per ASTM E 1592. Calculations shall include establishment of ultimate and allowable roof system uplift capacities for both the "field" and "areas of discontinuity".
 - 3. Provide confirmation of positive and negative buckling moments and uplift capacity determined by full-scale testing.
- F. ENVIRONMENTAL REQUIREMENTS: Actual independent laboratory certified test results must be submitted.
- 1. Resistance to air infiltration: .004 cfm per linear foot of joint when tested in accordance with ASTM E 1680 at static test pressure differential of 12.00 psf.
 - 2. Resistance to water infiltration: No leakage through panel joints when tested in accordance with ASTM E 1646 at static test pressure differential of 6.24 psf.

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications, engineered and sealed shop drawings, installation instructions and certified test reports.

B. Shop Drawings:

1. Submit a PDF set of approval / design drawings produced by the architectural standing seam metal roofing system manufacturer indicating thickness and dimensions of parts, fastening, flashing conditions, gutters, downspouts, roof curbs, gutter baffles, snow guards and anchoring methods, details and locations of seams, transitions and other provisions necessary for thermal expansion and contraction and weathertightness.
2. Indicate roof terminations, clearly showing flashings and change of direction caps.
3. Clearly indicate locations and types of field and factory applied sealants.
4. Show locations, spacing patterns and types of hold-down clips and fasteners.
5. Provide full size drawings produced by the architectural standing seam metal roofing system manufacturer showing a complete roof plan, roof panel layout and cross section details of every individual flashing condition for the entire roofing system. Section cut details to be minimum 1-1/2" inches per 12-inch scale.
6. Architectural drawings indicate size, profiles and dimensional requirements of architectural standing seam metal roofing panels required and are based upon the Lokseam system as manufactured by MBCI. Do not modify intended aesthetic effects, as judged solely by the Architect, except with Architects' written approval. Refer to Division 1 Section "Product Requirements". If modifications are proposed, submit comprehensive explanatory data to Architect a minimum of fifteen (15) days prior to the bid date for review and prior written approval. Any modifications will be put forth in a written and issued addendum.

C. Engineered Design Calculations:

1. Submit panel system manufacturer's design calculations verifying the panel system meets the design criteria specified.
2. Design calculations shall be sealed by a professional Structural Engineer employed by the manufacturer of the panel system and licensed to practice in the jurisdiction where the Project is located.

D. Samples for Initial Selection: For each type of metal roof panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

E. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Architectural Standing Seam Metal Roof Panels: 12 inches long by actual panel width. Include fasteners, clips, closures, and other metal roof panel accessories.
2. Trim and Closures: 12 inches long. Include fasteners and other accessories.
3. Accessories: 12-inch-long Samples for each type of accessory.
4. A 12-by-12-inch square of roof insulation.
5. Six insulation fasteners of each type, length, and finish.
6. Submit color samples on minimum 12" x 12" metal chips for Architect's approval.

F. Certification:

1. Submit manufacturer's certification that materials and finishes meet specified requirements for air infiltration, water penetration, thermal movement, and structural performance.
2. Submit written verification of Panel Applicator's factory installation training performed by the architectural standing seam metal roofing system manufacturer and a copy of the Panel Applicator's "Authorized Applicator" certificate.

G. Maintenance Data: For metal roof panels to include in maintenance manuals.

H. Warranties: Special warranties specified in this Section.

1.06 QUALITY ASSURANCE:

- A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.
1. Build mockup of typical roof area and eave including fascias shown on Drawings, including attachments underlayment and accessories.
 1. Build mockups for typical roof area only, including accessories.
 - a. Size: 6 feet long by 6 feet
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
- B. Panel Applicator Qualifications:
1. Panel Applicator must have a minimum of five (5) years experience in the successful application of architectural structural batten standing seam metal roofing systems.
 2. Panel Applicator must be factory trained and authorized by the architectural standing seam metal roofing system manufacturer prior to the bid date in order to obtain a contract for installation.
 3. Use adequate members of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work in this Section.
 4. Use equipment of adequate size, capacity and numbers to accomplish the Work of this Section in a timely manner.
 5. Upon request, submit a minimum of five (5) successfully completed projects of similar size and scope. List project address, date of installation with Architect and Owners names and telephone numbers.
 6. The Roofing System Manufacturer will provide weekly inspections of the roofing system throughout installation. Inspection shall be conducted by an employee of the manufacturer that is not in sales nor has sales responsibility. Inspector shall be a technical inspector of the company. Weekly reports shall be copied directly to the Architect.
- C. Manufacturer's Qualifications:
1. Minimum twenty (20) years experience in the fabrication of architectural standing seam metal roofing systems on projects of similar size and scope. Upon request, submit a minimum of five (5) projects references for Architect's review. List project address, date of installation with Architect and Owners names and telephone numbers.
 2. No other manufacturer of architectural standing seam metal roofing systems will be accepted without prior written approval of the Architect based upon the manufacturer verifying the products can meet or exceed all specified performance criteria listed in these specifications.
 3. Requests to be listed as an approved manufacturer must be submitted in writing a minimum of fifteen (15) days prior to bid date and be accompanied by product literature, technical information, sealed Engineer's calculations verifying conformance and a product sample. Approved manufacturers will only be set forth in a written and issued addendum.
 4. No substitutions will be permitted after the bid date.
- D. Professional Engineer Qualifications:
1. Professional Structural Engineer, employed by the architectural standing seam metal roof manufacturer, legally qualified and licensed to practice in the State of Georgia.
- E. Single Source Responsibility: Provide all items of architectural standing seam metal roofing system work specified herein by a single roofing contractor to provide undivided responsibility.
- F. Pre-installation Conference:
1. Convene a pre-installation conference prior to commencing Work of this Section.
 2. Attendants: Panel Applicator, installers for each component of associated work, installers of deck or substrate construction to receive roofing system work, General Contractor, Architect, Owner or Owner's Representative and architectural standing seam metal roofing manufacturer's technical representative.
 3. Record discussion, decisions and agreements reached and furnish a copy to each attendant.

4. Review installation procedures and coordination required with related Work.
5. Tour representative areas of roofing substrates, inspect and discuss condition of substrates, roof drains, curbs, penetrations, wood nailers and other preparatory Work performed by other trades.
6. Review structural loading limitations of roofing substrate and inspect substrate for loss of flatness and as required for mechanical fastening.
7. Review architectural standing seam metal roofing system requirements (approved manufacturer's shop drawings, specifications and other contract documents).
8. Review required submittals.
9. Review and finalize construction schedule related to architectural standing seam metal roofing system work and verify availability of material, Panel applicator's personnel, equipment and facilities needed to avoid delays.
10. Review weather and forecasted weather conditions and procedures for coping with unfavorable weather conditions, including possibility of temporary roofing.
11. Verify locations of roof framing and roof opening dimensions by field measurements before metal roof panel fabrication and indicate measurements on manufacturer's approved Shop Drawings.
12. General Contractor to document the meeting with written minutes and copy all in attendance.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Delivery:
 1. Delivery of material shall be made only after suitable facilities for its storage and protection are available at the Project site.
 2. Protect products and accessories from damage and discoloration during transit and at project site.
 3. Upon receipt of preformed and prefinished architectural standing seam metal roofing panels, flat sheets, flashings and panel accessories; Panel Applicator shall examine each container for damage during transit and completeness of the consignment.
- B. Storage:
 1. Store materials out of the weather in a clean, dry place. One end of each container should be slightly elevated and covered with a loose weatherproof covering to prevent condensation.
 2. Panels and/or flashings with strippable film must not be stored in areas exposed to direct sunlight.
 3. Care should be taken to prevent contact with any substance that may cause discoloration.
 4. Store materials to provide ventilation and prevent bending, abrasion or twisting.
 5. Do not overload roof structure with stored materials. Do not permit material storage or foot traffic on completed roof surfaces.
- C. Handling:
 1. Care should be taken to avoid gouging, scratching or denting.
 2. Do not allow foot traffic on completed roof. If required, provide cushioned walk boards.
 3. Protect installed products from damage caused by foreign objects and other trades until completion of the project.
 4. Comply with pertinent provisions of Supplementary General Conditions.

1.08 WARRANTIES

- A. Substrate Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of architectural standing seam metal roofing system that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Structural failures, including rupturing, cracking, or puncturing.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 2. Warranty Period: Twenty (20) years from date of Substantial Completion.
- B. Panel Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair, refinish or replace architectural standing seam metal roofing system panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer (Kynar-500) Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading or color change in excess of 5 NBS units as measured per ASTM D 2244-68;
 - b. Will not Chalk in excess of a Numerical rating of 7 when measured in accordance with standard procedures specified in ASTM D 659-74;
 - c. Will not crack, peel or delaminate.
 2. Finish Warranty Period: Twenty (20) years from date of Substantial Completion.
- C. Workmanship Warranty: Furnish a written warranty signed by the Panel Applicator guaranteeing materials and workmanship.
1. Warranty Period: Two (2) years from date of Substantial Completion.
- D. Special Weather Tightness Warranty: Furnish architectural standing seam metal roofing system manufacturer's full system, non-prorated, no dollar limit weather tightness warranty, jointly signed by the manufacturer and Panel Applicator, agreeing to repair or replace architectural standing seam metal roofing panels or flashings that fail to remain weather tight within the specified warranty period.
1. Warranty Period: Twenty (20) years from date of Substantial Completion.

PART 5 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

- A. Architectural standing seam metal roofing system: MBCI or prior approved equal. Prior approval is required per Supplementary General Conditions, and alternate manufacturers must be approved per written and issued addendum a minimum of fifteen (14) days prior to the bid date. Approved Manufacturers, meeting the requirements of this specification, are as follows.
1. Metal Sales Manufacturing Corp
 2. Firestone/UNA-CLAD
 4. McElroy Metal – Medallion-Lok
 5. Peterson Aluminum – Pac Clad
 6. Architectural Metal Systems
 7. Imetco
- B. BITUTHANE MEMBRANE WATERPROOF UNDERLAYMENT:.
1. Grace "Ice and Water Shield – 40 mil.

2.02 MATERIALS:

- A. PANELS:
1. Prefinished Galvalume sheet, ASTM AZ50 made of 55% aluminum, 1.6% silicon and the balance zinc as described in ASTM specification A792.
 2. Panels shall be 24 gage with Fluoropolymer (Kynar 500) Finish.
 3. Factory fabricated panel with integral continuous overlapping seams suitable for continuous locking or crimping by mechanical means during installation. Onsite, mechanically seamed or field roll formed panel profiles will not be acceptable.
 4. Seam Size:
 - a. Male leg: 1-3/8" high,
 - b. Female leg: 1-3/4" high,
 5. Provide factory installed, high grade, hot-melt elastomeric sealant, within the confines of female seam flange, on bottom edge of female seam flange, designed to seal against adjacent male panel leg.
 6. Acceptable architectural standing seam metal roofing system: MBCI Lokseam.

B. CLIP/FASTENER ASSEMBLIES:

1. Typical clip, UL 90 requirements:
 - a. UL-90 Fasteners: as per approved manufacturer's engineered shop drawings.
 - b. UL Rated Clip: 16 gage galvanized steel hook with structural base embossments to raise the panel slightly off the substrate to reduce condensation.
 - c. Bearing Plates: minimum 4"x6" by 22 gage flat notched and slotted bearing plates for use under the clip assembly to distribute point loads and prevent indentation into the insulation.
 2. Standard Fasteners: Same as UL 90 fasteners specified above.
- C. ACCESSORIES: To match roof in finish.
1. Provide manufacturer's standard accessories and other items essential to completeness of architectural standing seam roof installation.
 2. Roof Jacks: Manufacturer's standard EPDM with an aluminum sealing base ring; for openings twelve (12) inches or smaller.
 3. Roof Curbs: fabricated to the specifications of the architectural standing seam metal roof manufacturer, thereby assuring compatibility with the roof construction framing and covering. Roof curbs shall be of sufficient size and design to coordinate with requirements for support of heat and smoke vents specified in another Division 7 Section. Roof curb flashing and framing shall provide for the expected expansion and contraction of the architectural standing seam metal roofing system.
 4. Gutters and downspouts will be fabricated, and supplied by the same manufacturer, to the same gage and specification as panel.
- D. FIELD SEALANTS:
1. Color coordinated primerless silicone, urethane, or high-grade, nondrying butyl as recommended and engineered by panel manufacturer.
 2. Do not use sealants containing asphalt.
- E. BITUTHANE MEMBRANE WATERPROOF UNDERLAYMENT:
1. Flexible, self-adhering rubberized asphalt sheet membrane with a polymeric film on the surface and a removable silicone-treated release sheet on the adhesive side
 2. Bituthane membrane underlayment shall be rated for a minimum temperature resistance of up to 260 degrees F.
 3. Bituthane membrane shall have a maximum permeance rating of 0.05 perms.
 4. Minimum thickness shall be 40 mils.
 5. Granular surfaced membranes are not acceptable.
- F. POLYISOCYANURATE RIGID INSULATION:

See section 07221 for full requirements of Metal Roof Insulation. Coordinate this section with requirements.

2.03 ACCESSORIES

- A. Architectural standing seam metal roof system panel accessories: Provide components required for a complete architectural standing seam metal roofing system including, but not limited to: flashings, copings, fasciae, corner units, ridge vents and ridge closures, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels, unless otherwise indicated.
1. Vents: Provide vents at ridges, fabricated of same metal as metal roof panels, with corrugated baffle insert to prevent insect infestation; equivalent to Cor-A-Vent Model V300/CS, plastic hollow core vented insert.
 2. Closures: Provide metal closures at eaves and ridges, fabricated of same metal as metal roof panels.
- B. Flashings and Trim: Formed from 0.030 thick (24 gage) thick Galvalume (tm) aluminum-zinc alloy coated steel sheet prefinished by coil coating. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers. Flashings and Trims shall be the same finish, gage and color as the specified roofing system.

- C. Gutters: Formed from 0.030" (22 gage) thick Galvalume (tm) aluminum-zinc alloy coated steel sheet prefinished by coil coating, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch-long sections, sized according to SMACNA's "Architectural Sheet Metal Manual." Furnish flat stock gutter straps and brackets spaced 30 inches on center, fabricated from same metal as gutters 3/16" x 1 1/2". Provide steel or aluminum wire ball strainers at outlets. Gutters shall be the same finish, gage and color as the specified roofing system.
- D. Downspouts: Formed from 0.030" (22 gage) thick Galvalume (tm) aluminum-zinc alloy coated steel sheet prefinished by coil coating; in minimum 10-foot long sections, complete with formed elbows and offsets. Downspouts shall be the same finish, gage and color as the specified roof system. Furnish with 3/16" x 1 1/2" metal hangers to match gutters. Fabricate seams using flat stock seams meeting SMACNA.
- E. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.

2.04 FABRICATION

- A. Panels:
 - 1. Provide factory formed panel widths of 16", with a 1-3/4" high architectural standing seam panels.
 - 2. On-site or field roll formed panels are not acceptable.
 - 3. Provide panels in full length from ridge to eave.
 - 4. Roof panels shall have flush horizontal and vertical surfaces to facilitate sealing at terminations. Panel configurations that create voids and require supplemental closure devices are acceptable.
- B. Seams:
 - 1. Panel seams shall interlock along entire length of seam.
 - 2. Design seams to lock up and resist joint disengagement during design wind uplift conditions as calculated to comply with local building codes and design uplift criteria.
 - 3. Provide factory sealant within confines on trailing edge of female seam leg to aid in resistance of leaks and provide panel-to-panel seal while allowing expansion and contraction movement, and the seams shall be continuously locked together during installation without the use of field seaming machinery.
- C. Clips:
 - 1. Provide UL listed clip designed to allow panels to thermally expand and contract and provide a minimum of ± 1 inch of thermal movement. Clip shall incorporate a self-centering feature to allow a minimum of 1" of movement in both directions along panel length.
 - 2. Clip shall be designed to meet positive and negative pressures as calculated per local building code and as engineered by the roofing system manufacturer.
- D. Expansion and Contraction:
 - 1. Engineer panels to use concealed anchors that permit expansion and contraction, except at end laps, ridges and hips.
- E. Trim/Flashings:
 - 1. Prefinished sheet metal designed and supplied by the architectural standing seam metal roof system manufacturer in the same gage, material and finish as the architectural standing seam metal roofing system.
 - 2. Locations, design, sealing and fastening methods as per the manufacturer's approved engineered shop drawings.
 - 3. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
 - 4. Sealed Joints: Form non-expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
 - a. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not

allowed on faces of accessories exposed to view.

2.05 FINISH:

- A. Fluorocarbon Coating:
 - 1. Full strength 70% Kynar 500® coating baked on for 15 minutes at 450 degrees F to dry-film thickness of 1.0 mil.
 - 2. 15% reflective gloss (ASTM D 523). (Low Gloss).
 - 3. 0.3 mil baked on epoxy primer.
 - 4. Color: From manufacturer's full line.

PART 3 - EXECUTION

3.01 CONNECTING WORK:

- A. General: Provide metal roofing panels of full length from eave to ridge when possible.
 - 1. Field cutting by torch is not permitted.
 - 2. Do not apply roofing during inclement weather.
 - 3. Do not apply roofing to damp or frozen deck surface.
 - 4. Do not expose materials vulnerable to water, wind or sun damage in quantities greater than can be weatherproofed during the same day.
 - 5. Rigidly fasten Ridge of metal roof panels and allow free eave movement due to thermal expansion and contraction per the approved shop drawings.
 - 6. Install screws fasteners with power tools having controlled torque.
 - 7. Locate and space fasteners per approved shop drawings in true vertical and horizontal alignment.
 - 8. Install Ridge, Hip and penetration flashings per the approved shop drawings as work progresses.
 - 9. Position roof jacks only in the flat of the panel; do not alter or impede standing seam ribs.
- B. The Panel Applicator shall examine all surfaces on which their work is to be applied, and shall notify the architect in writing if not suitable to receive their work. Work on any surface shall constitute acceptance of this surface by the Panel Applicator. After beginning installation, install approximately 500 square feet of panels for Architect's approval, before proceeding with substantial work.

3.02 FIELD MEASUREMENTS:

- A. Panel Applicator must take field measurements to verify or supplement dimensions indicated prior to fabrication of any materials. Where field measurements cannot be made without delaying the work, either establish opening dimensions and proceed with fabricating panels without field measurements or allow for trimming panel units.

3.03 RIGID BOARD INSULATION INSTALLATION:

- A. Comply with system manufacturer's written instructions for installing roof insulation.
 - 1. Install one (1) layer of insulation under area of roofing in required thickness to achieve specified 'R' value. Install insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding ¼ inch with insulation.
 - 2. Attach insulation to deck as recommended by the insulation manufacturer in the required pattern to achieve a UL-90 wind uplift rated assembly.
 - 3. Use UL rated fasteners as recommended by the insulation manufacturer.
 - 4. Seal all joints in top layer of insulation with sealing tape.
 - 5. Apply no more insulation than can be covered in the same workday.

3.04 ACCESSORY INSTALLATION

- A. Waterproof Underlayment Installation: Apply waterproof underlayment over entire roof surface perpendicular to metal roofing panels and over parapet blocking per manufacturer's written instructions,

but with not less than six (6) inch laps at vertical (side) laps and four (4) inch horizontal (top and bottom) laps.

- B. Hanging Gutters: Join sections with riveted and soldered or lapped and sealed joints with elastomeric sealant. Allow for thermal movement. Attach gutters at eave or fascia to firmly anchored gutter brackets spaced not more than 30 inches apart. Provide end closures and seal watertight with sealant. Provide for thermal expansion.
 - a. Fasten gutter straps to front and back of gutter at 30" o.c. spaced alternately with brackets.
 - b. Loosely lock straps to front gutter bead and anchor to roof deck.
 - c. Install gutter with expansion joints at locations not to exceed 50' and at roof expansion joints.
 - d. Provide gutter baffles at valleys.

3.05 METAL ROOFING INSTALLATION, GENERAL:

- A. Workmanship shall conform to standards set forth in the architectural sheet metal manual as published by SMACNA.
- B. Comply with manufacturer's instructions for assembly, installation, and erection in order to achieve a weather tight installation. Install in accordance with approved shop drawings.
 - 1. Anchor securely in place using clips and fasteners spaced in accordance with manufacturer's recommendations for design wind load criteria.
 - 2. Panels should be installed in such a manner that horizontal lines are true and level and vertical lines are plumb.
 - 3. Field apply sealant to penetrations, transitions, and other locations as necessary (not inside the standing seam ribs) for an airtight, waterproof installation.
 - 4. Remove all protective film, if any, before installation of materials.
- C. Dissimilar Metals: Do not allow panels or flashings to come into contact with dissimilar metals.

3.06 CLEAN UP:

- A. Clean exposed surfaces of work promptly after completion of installation.
- B. Only minor scratches and abrasions will be allowed to be touched up. Any other damaged material shall be replaced.
- C. Leave work areas clean, free from grease, dirt, finger marks, stains and stains.
- D. Remove scrap and debris from surrounding grounds and work areas daily.

3.07 PROTECTION:

- A. Metal Roofing: Protect work as required to ensure that structural standing seam metal roof system will be without damage at time of final completion.
- B. Rigid Insulation: Cover insulation as soon as possible with specified underlayment for protection against excessive moisture prior to roofing application.

END OF SECTION

SECTION 07415 - METAL SOFFIT / WALL PANEL SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. Work Included: The contractor shall provide all material, labor, and administration and other items to provide a complete prefinished preformed metal soffit / wall panel system complying with performance requirements indicated and capable of withstanding structural movement, thermally induced movement and exposure to weather.
- B. Coordinate preformed metal soffit / wall panel system substructure framing work.
- C. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary General Conditions, and Sections in Division 1 of these Specifications.
- D. One Manufacturer shall provide all work associated this section and Section 07411 - Architectural Metal Roof Panels

1.2 SECTION INCLUDES:

- A. Preformed and prefinished manufacturer's fully engineered preformed metal soffit / wall panel system with continuous interlocking seams, light gage framing supports and concealed fastening devices.
- B. Color coordinated metal closures, splice plates, miscellaneous flashings and attachment devices.
- C. Provide concealed fasteners, closures and sealants as necessary to meet design criteria.
- D. Light gage steel sub-framing.

1.3 RELATED SECTIONS:

- A. Division 5 Section "Structural Steel" for structural steel framing.
- B. Division 6 Section "Rough Carpentry" for nailers and miscellaneous blocking.

1.4 SYSTEM DESCRIPTION:

A. DESIGN REQUIREMENTS:

- 1. The factory preformed metal soffit / wall panel system, including: panels, flashings, light gage steel sub- framing and attachment accessories and screws shall be designed by the metal soffit / wall system manufacturer per ASTM E 72 (chamber) testing to meet the local building code. The design criteria shall include the following:
 - a. Listing of applicable loads.
 - b. Listing of the building importance factor (life safety factor).
 - c. Design wind speed.
 - d. Building exposure factor.
 - e. Other necessary criteria.
- 2. The preformed metal soffit / wall panel system manufacturer shall provide an engineered analysis of the soffit / wall system, sealed by a registered Structural Engineer employed by the manufacturer and licensed in the State of Georgia, verifying that the product and attachment methods will resist wind pressures imposed upon it pursuant to the applicable building codes and that the soffit / wall system fully complies with all specified requirements.
- 3. Provide factory preformed soffit / wall panel system that has been pretested and certified by manufacturer to comply with specified requirements under installed conditions.
- 4. Provide one piece, single length preformed metal soffit / wall panels.

5. Provide continuous interlocking seams with open hem male legs that inherently increase load span capability, stiffness and flexural stress handling.
6. [Wall Systems Only:] Provide continuous field installed butyl sealant within the panel seams.
7. Provide factory-preformed panel that has been tested and approved for a Class 4 Impact (Hail) resistance rating per UL 2218. Listing shall be present on the UL website (Refer to Underwriters Laboratories website at www.ul.com)
8. On-site, press-broken or field rollformed panels are not acceptable.

B. STRUCTURAL REQUIREMENTS:

1. Panel structural properties determined in accordance with latest edition of American Iron and Steel Institute's "Cold Formed Steel Design Manual," using "effective width" concepts.
2. Wind pressure design for preformed metal soffit / wall panel systems shall be calculated by the metal soffit / wall panel system manufacturer per ASTM E 72 (chamber) test method. Calculations shall include establishment of ultimate and allowable soffit / wall panel system span capacities for both the "field" and "areas of discontinuity".
3. Provide confirmation of positive and negative buckling moments and span capacity determined by full- scale tests.

C. SUBSTRATE CRITERIA:

1. Factory Preformed Soffit / Wall Panels: Manufacturer's fully engineered factory preformed metal soffit / wall panel system installed over light gage steel framing that is capable of withstanding design criteria specified in Section A.1 above.
2. Light Gage Steel Framing: Provide light gage steel framing designed and supplied by the preformed metal soffit / wall panel system manufacturer, capable of withstanding the design criteria specified in Section A.1 above and spaced as shown on the approved shop drawings. Fastening pattern for light gage framing shall be per system manufacturer's design using noncorrosive fasteners.

1.5 SUBMITTALS:

- A. PRODUCT DATA:** Submit manufacturer's specifications, engineered detail drawings, and installation instructions.

B. SHOP DRAWINGS:

1. Submit three (3) sets of approval design drawings produced by the preformed metal soffit / wall panel system manufacturer indicating thickness and dimensions of parts, fastenings and anchoring methods, details and locations of seams, transitions, framing and other provisions necessary for thermal expansion and contraction.
2. Indicate soffit / wall panel terminations, clearly showing flashings and closure methods.
3. Clearly indicate locations of field and factory applied sealants.
4. Show locations, spacing patterns and types of hold-down fasteners.
5. Provide drawings by the preformed metal soffit / wall system manufacturer showing complete reflected roof, soffit, plan, wall elevation plans, wall panel layout, and cross section details for every individual condition of the entire soffit / wall panel system.

C. SAMPLES:

1. Submit two samples, 12" long x full width of panel, showing proposed metal gauge and seam profile.
2. Submit color samples on metal for Architect's selection from manufacturer's standard color offering. Color and finish must match the architectural metal roof panels.

D. TEST REPORTS:

1. Submit certified test reports confirming ASTM E 72 (chamber method) testing.

E. ENGINEERED DESIGN CALCULATIONS:

1. Submit preformed metal soffit / wall panel system manufacturer's design calculations verifying the panel system meets the specified building code as defined in Section A.1 Design Requirements listed above.
2. Design calculations shall be sealed by a registered Structural Engineer employed by the manufacturer of the preformed metal soffit / wall panel system that is licensed in the State of Georgia.

F. CERTIFICATION:

1. Submit manufacturer's certification that materials and finishes meet specified requirements.
2. Submit written verification of panel Applicator's factory installation training performed by the preformed metal soffit / wall panel system manufacturer and a copy of the Panel Applicator's "Authorized Applicator" certificate.

1.6 QUALITY ASSURANCE:

A. MANUFACTURER'S QUALIFICATIONS:

1. Minimum twenty (20) years experience in the fabrication of preformed metal soffit / wall panel systems on projects of similar size and scope. Upon request, submit a minimum of five (5) project references for Architect's review. List project address, date of installation, Architects and Owner's name and telephone numbers.
2. Requests to be listed as an approved manufacturer must be submitted in writing a minimum fifteen (15) days prior to bid date accompanied by product literature, technical information, sealed engineer's calculations verifying conformance, and a product sample. Approved manufacturers will only be set forth in a written and issued addendum.
3. No substitutions will be permitted after the bid date.

B. APPLICATOR QUALIFICATIONS:

1. Panel Applicator must have a minimum of five (5) years experience in the application of preformed metal soffit / wall panel systems.
2. Panel Applicator must be factory trained and approved by the preformed metal soffit / wall panel system manufacturer prior to the bid date in order to obtain a contract for installation.
2. Use adequate members of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this Section.
4. Use equipment of adequate size, capacity and numbers to accomplish the work of this Section in a timely manner.
5. Upon request, submit a minimum of five (5) successfully completed projects of similar size and scope. List project address, date of installation, Architect and Owner's name and telephone numbers.
6. Single Source Responsibility: Provide all items of preformed metal soffit / wall panel system work specified herein by a single contractor to provide undivided responsibility.

C. REGULATORY REQUIREMENTS:

1. Comply with all requirements of applicable building codes and other agencies having jurisdiction for positive and negative design loads of preformed metal soffit / wall panel systems.
2. Preformed metal soffit / wall panel system shall be previously tested per ASTM E 72.

1.7 DELIVERY, STORAGE AND HANDLING:

A. DELIVERY:

1. Delivery of material shall be made only after suitable facilities for its storage and protection area available on the site.
2. Protect products and accessories from damage and discoloration during transit and at project site.
3. Upon receipt of prefinished preformed metal soffit / wall panels, flatsheets, flashings and panel accessories, Panel Applicator shall examine each container for damage and for completeness of the consignment.

B. STORAGE:

1. Protect products and accessories from damage and discoloration during transit and at project site. Store materials out of the weather in a clean, dry place. One end of each container should be slightly elevated and covered with a loose weatherproof covering to prevent condensation.
2. Panels and/or flashings with strippable film must not be stored in areas exposed to direct sunlight. Remove strippable film before installation.
3. Store materials to provide ventilation and prevent bending, abrasion or twisting.
4. Do not overload roof structure with stored materials. Do not permit material storage or traffic on completed roof surfaces.

C. HANDLING:

1. Care should be taken to avoid gouging, scratching or denting.
2. Do not allow traffic on completed roof. If required, provide cushioned walk boards.
3. Protect installed products from damage caused by foreign objects and construction until completion of project.
4. Comply with pertinent provisions of Supplementary General Conditions.

1.8 WARRANTY:

A. Furnish manufacturer's standard 20-year written finish warranty stating that architectural fluorocarbon finish will be:

1. Free from fading or color change in excess of 5 NBS units as measured per ASTM 2244-68;
2. Will not chalk in excess of a numerical rating of 7 when measured in accordance with standard procedures specified in ASTM D 659-74;
3. Will not peel, crack, chip or delaminate

B. Furnish a written warranty signed by the Panel Applicator for a two-year period from the date of substantial completion of the building guaranteeing materials and workmanship for the preformed metal wall panel system, flashings and penetrations.

1.9 PRE-INSTALLATION CONFERENCE:

- A. Convene prior to commencing work of this Section.
- B. Attendants: Panel Applicator, installer of each component of associated work, installers of deck or substrate construction to receive soffit / wall panel work, Architect, Owner or Owner's Representative, soffit / wall panel system manufacturer's technical representative and General Contractor.
- C. Record discussion, decisions and agreements reached and furnish a copy to each attendant.

- D. Review installation procedures and coordination required with related Work.
- E. Tour representative areas of soffit / wall panel system substrates, inspect and discuss condition of substrates, penetrations, wood nailers and other preparatory work performed by other trades.
- F. Review structural loading limitations of primary structure and inspect work areas for loss of flatness and as required for mechanical fastening.
- G. Review soffit / wall panel system requirements, approved manufacturer's shop drawings, specifications and other contract documents.
- H. Review required submittals.
- I. Review and finalize construction schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to avoid delays.
- J. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing.
- K. Contractor to document the meeting with written minutes and copy all in attendance.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

See Section 07411 - Architectural Metal Roof Panels – one manufacturer – installer is required for both systems.

- A. LIGHT GAGE FRAMING SUBSTRATE: Light gage framing members, minimum 16 gage, designed and spaced per preformed metal soffit / wall panel system manufacturer's approved shop drawings.

2.2 MATERIALS:

A. PANELS:

- 1. Prefinished Galvalume sheet, ASTM AZ55 made of 55% aluminum, 1.6% silicon and the balance zinc as described in ASTM specification A792.
- 2. Panels shall be 22 gauge (0.030" thick) with Kynar 500 Finish.
- 3. Factory prefabricated preformed soffit / wall panel with interlocking seams with open hem male legs suitable for continuous engagement during installation. Onsite, press-broken or field rollformed soffit / wall panel profiles will not be acceptable.
- 4. Panel Dimensions:
 - a. Panel Width: 12" (Flush Panel).
 - b. Rib Height: Nominal 1" high (Flush Panel).
- 5. Interior Panel Stiffening Ribs:
 - a. FP12"-0: Flat, smooth appearance, no interior pencil grooves.
 - b. Provide vented, perforated panels where shown.
 - c. Basis of Design" MBCI Artisan

B. FASTENER ASSEMBLIES:

- 1. Typical Soffit / Wall Panel Fasteners:
 - a. Manufacturer's engineered #10-16x1" long self-drilling, self-tapping pancake head Phillips drive screws in a noncorrosive base material for metal-to-metal applications.
 - b. Fastener spacing to be per approved engineered shop drawings to resist system load requirements. Exposed fasteners in soffit / wall panels will not be permitted.
- 2. Light Gage Framing Fasteners:
 - a. #12-14x1" long self-drilling, self-tapping 516" hex head Tek screws in a noncorrosive base material for metal-to-metal applications.

- b. Fastener spacings to be per the manufacturer's approved engineered shop drawings for size, location and pull-out strength to resist system load requirements.

C. ACCESSORIES:

1. Provide manufacturer's standard accessories and other items essential to completeness of preformed metal soffit / wall panel system installation including flashing anchor cleats, trims, metal closures and miscellaneous flashings. Flashings to be factory formed from the same gage and finish as the preformed metal soffit / wall panels unless specifically noted otherwise.

D. FIELD SEALANTS:

1. Color coordinated primerless silicone, urethane, or high-grade, nondrying butyl as recommended and engineered by panel manufacturer.
2. Do not use sealants containing asphalt.

E. LIGHT GAGE STEEL FRAMING:

1. Provide light gage steel framing designed and supplied by the preformed metal soffit / wall panel system manufacturer.
2. Size, spacing and attachment of light gage steel framing to be per the preformed metal soffit / wall panel system manufacturer's approved shop drawings and capable of withstanding the design criteria specified in Section A.1 above.

2.3 FABRICATION:

A. Panels:

1. Provide factory formed panel widths of 12", with a nominal 1" deep rib height.
2. On-site, press-broken or field rollformed panels are not acceptable.
3. Provide panels in full length wherever possible, not to exceed 30'-0" in length.
4. Where single length panels are not practical provide an engineered flush lap joint.
5. Wall soffit / panels shall have flush horizontal and vertical surfaces to facilitate sealing at terminations. Panel configurations that create voids and require supplemental closure devices are unacceptable.

B. Panel Ribs:

1. Provide panel ribs that continuously interlock along entire length of rib with open hem male legs and without the use of field seaming machines. Button punched, riveted or soldered seams are unacceptable.
2. Vinyl gaskets inside female ribs are not acceptable.

C. Panel Fasteners:

1. Provide manufacturer's engineered #10-16x1" long, self-drilling, self-tapping pancake head Phillips drive screws in a noncorrosive base material.
2. Fastener spacing to be as per the manufacturer's approved engineered shop drawings for size, location and pull-out strength to resist system load requirements.
3. Exposed fasteners in wall panels are unacceptable.

D. Light Gage Steel Framing:

- a. Supply and install light gage framing as designed and supplied by the manufacturer of the preformed metal soffit / wall panel system. Install in accordance with manufacturer's approved engineered shop drawings.

E. Trim Flashings:

- a. Prefinished sheet metal designed and supplied by the manufacturer in the same gauge, material and finish as the preformed metal soffit / wall panel system.
- b. Locations, design, sealing and fastening methods as per the manufacturer's approved engineered shop drawings.

2.4 FINISH:

Match Section 07411 - Architectural Metal Roof Panels

PART 3 - EXECUTION

3.1 CONNECTING WORK:

- A. General: Provide metal roofing panels of full length from eave to ridge when possible.
 - 1. Field cutting by torch is not permitted.
 - 2. Do not apply soffit / wall panels during inclement weather.
 - 3. Do not apply soffit / wall panels to damp or frozen surfaces.
 - 4. Do not expose materials vulnerable to water, wind or sun damage in quantities greater than can be weatherproofed during the same day.
 - 5. Install screws fasteners with power tools having controlled torque.
 - 6. Locate and space fasteners per the approved shop drawings in true vertical and horizontal alignment.
 - 7. Install flashings per the manufacturer's approved engineered shop drawings as work progresses. Cut penetrations in the flat of the panel, do not alter panel ribs.
- B. The Panel Applicator shall examine all surfaces on which their work is to be applied, and shall notify the architect in writing if not suitable to receive their work. Work on any surface shall constitute acceptance of this surface by the Panel Applicator. After beginning installation, install approximately 500 square feet of panels for Architect's approval, before proceeding with substantial work.
- C. Wood Members, Units: Comply with requirements of Division 6 Wood Blocking of these specifications for nailers and other wood members indicated as soffit / wall panel system work. Provide wood pressure treated with water-borne preservatives for above ground use. All nailers shall be anchored sufficiently to resist a force of 75 pounds per linear foot in any direction. Provide nailers at all locations required by the roofing manufacturer (whether shown or not) – verify conditions prior to commencement of roofing installation.

3.2 FIELD MEASUREMENTS:

- A. Panel Applicator must take field measurements to verify or supplement dimensions indicated prior to fabrication of any materials. Where field measurements cannot be made without delaying the work, either establish opening dimensions and proceed with fabricating panels without field measurements or allow for trimming panel units.

3.3 LIGHT GAGE STEEL FRAMING INSTALLATION:

- A. Comply with system manufacturer's written instructions for installing light gage steel framing.

1. Install framing per manufacturer's approved engineered shop drawings for size, spacing and attachment of all members.
2. Cover light gage steel framing as soon as possible for protection against excessive moisture prior to preformed metal soffit / wall panel application.
3. Do not install light gage steel framing in adverse weather conditions. Light gage steel framing that is damaged, bent or twisted will be rejected.

3.6 PREFORMED METAL SOFFIT / WALL INSTALLATION:

- A. Workmanship shall conform to standards set forth in the architectural sheet metal manual as published by SMACNA.
- B. Comply with manufacturer's instructions for assembly, installation, and erection. Install in accordance with approved shop drawings.
 1. Anchor preformed metal soffit / wall panels securely in place using fasteners spaced in accordance with manufacturer's recommendations for design load criteria.
 2. Panels should be installed in such a manner that horizontal lines are true and level and vertical lines are plumb.
 3. Field apply sealant to penetrations, transitions, and other locations as necessary per the manufacturer's approved engineered shop drawings.
 4. Remove all protective film, if any, before installation of materials.
- C. Dissimilar Metals:
 1. Do not allow panels or flashings to come into contact with dissimilar metals.

3.7 CLEAN UP:

- A. Clean exposed surfaces of work promptly after completion of installation.
- B. Only minor scratches and abrasions will be allowed to be touched up. Any other damaged material shall be replaced.
- C. Leave work areas clean, free from grease, dirt, finger marks, stains and stains.
- D. Remove scrap and debris from surrounding grounds and work areas daily.

3.8 PROTECTION:

- A. Preformed Metal Soffit / Wall Panels: Protect work as required to ensure that preformed metal soffit / wall panel system will be without damage at time of final completion.
- B. Light Gage Steel Framing: Cover light gage steel framing as soon as possible for protection against excessive moisture prior to preformed metal soffit / wall panel system application.

END OF SECTION

SECTION 07542 – THERMOPLASTIC POLYOLEFIN (TPO) MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. TPO Mechanically fastened membrane roofing system.
- B. Roof insulation.

1.2 RELATED SECTIONS

- A. Division 05 Section "Steel Decking" for steel roof deck.
- B. Division 06 Section "Miscellaneous Rough Carpentry" for wood nailers, cants, curbs, and blocking [and for wood-based, structural-use roof deck panels].
- C. Division 07 Section "Sheet Metal Flashing and Trim" for metal roof penetration flashings, flashings, and counter flashings not included in this section. Requirements of this section shall govern.

1.3 REFERENCES

- A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms in this Section:
 - 1. ASTM D 1079 "Terminology Relating to Roofing and Waterproofing."
 - 2. Glossary of NRCA's "The NRCA Roofing and Waterproofing Manual."
 - 3. Roof Consultants Institute "Glossary of Roofing Terms."
- B. Sheet Metal Terminology and Techniques: SMACNA "Architectural Sheet Metal Manual."

1.4 DESIGN CRITERIA

- A. General: Installed roofing membrane system shall remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.
- B. Material Compatibility: Roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.
- C. Installer must comply with current code requirements based on authority having jurisdiction.
- D. Wind Uplift Performance: Roofing system shall be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.
- E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

1.5 SUBMITTALS

- A. Product Data: Manufacturer's data sheets for each product to be provided.
- B. Detail Drawings: Provide roofing system plans, elevations, sections, details, and details of attachment to other Work, including:
 1. Base flashings, cants, and membrane terminations.
 2. Tapered insulation, including slopes.
 3. Crickets, saddles, and tapered edge strips, including slopes.
 4. Insulation fastening patterns.
- C. Verification Samples: Provide for each product specified.
- D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.
- E. Maintenance Data: Refer to Johns Manville's latest published documents on www.JM.com.
- F. Guarantees: Provide manufacturer's current guarantee specimen.
- G. Prior to beginning the work of this section, roofing sub-contractor shall provide a copy of the final System Assembly Letter issued by the manufacturer indicating that the products and system to be installed shall be eligible to receive the specified manufacturer's guarantee when installed by a certified installer in accordance with the application requirements, inspected and approved by a Manufacturer's Technical Representative.
- H. Prior to roofing system installation, roofing sub-contractor shall provide a copy of the Guarantee Application Confirmation document issued by the manufacturer indicating that the project has been reviewed for eligibility to receive the specified guarantee and registered.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive the specified manufacturer's guarantee.
- B. Manufacturer Qualifications: Qualified manufacturer that has UL listing for roofing system identical to that used for this Project.
- C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E329.
- D. Test Reports:
 1. Roof drain and leader test or submit plumber's verification.
- E. Source Limitations: Obtain all components from the single source roofing manufacturer guaranteeing the roofing system. All products used in the system must be labeled by the single source roofing manufacturer issuing the guarantee.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and guarantee requirements.

1.9 GUARANTEE

- A. Provide manufacturer's system guarantee equal to Johns Manville's Peak Advantage No Dollar Limit Roofing System Guarantee.
 - 1. Single-Source special guarantee includes roofing membrane, base flashings, liquid applied flashing, roofing membrane accessories, roof insulation, fasteners, walkway products, manufacturer's expansion joints, manufacturer's edge metal products, and other single-source components of roofing system marketed by the manufacturer.
 - 2. Guarantee Period: 20 years from date of Substantial Completion.
- B. Installer's Guarantee: Submit roofing Installer's guarantee, including all components of roofing system for the following guarantee period:
 - 1. Guarantee Period: Two years from date of Substantial Completion.
- C. Existing Guarantees: Guarantees on existing building elements should not be affected by scope of work.
 - 1. Installer is responsible for coordinating with building owner's representative to verify compliance.

PART 2 - PRODUCTS

2.1 THERMOPLASTIC POLYOLEFIN ROOFING MEMBRANE - TPO

- A. Fabric-Reinforced Thermoplastic Polyolefin Sheet: ASTM D 6878, uniform, flexible sheet formed from a thermoplastic polyolefin, internally fabric or scrim reinforced. Basis of Design: JM TPO or Firestone. Other manufacturers are encouraged to submit a substitution request per section 00020.
 - 1. Thickness: 60 mils (1.52 mm), nominal

2. Exposed Face Color: Gray

2.2 AUXILIARY ROOFING MATERIALS – SINGLE PLY

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
 1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: Manufacturer's internally reinforced or scrim reinforced, smooth backed membrane with same thickness and color as sheet membrane. Basis of Design: JM TPO
- C. Bonding Adhesive: Manufacturer's standard solvent-based bonding adhesive for membrane, and solvent-based bonding adhesive for base flashings. Basis of Design: JM Membrane Bonding Adhesive (TPO&EPDM)
- D. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors. Basis of Design: JM Termination Systems
- E. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer. Basis of Design: High Load Fasteners and Plates
- F. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, cover strips, and other accessories. Basis of Design: JM TPO Pourable Sealer A & B, JM TPO Pipe Boots, JM TPO Universal Corners, JM TPO Edge Sealant, JM TPO T-Joint Patch, JM TPO Membrane Cleaner, JM TPO Membrane Primer, JM TPO Membrane Primer (Low VOC), JM TPO Sealing Mastic, JM TPO Cover Tape, JM TPO Detail Membrane, JM TPO Peel & Stick 10" RPS, JM TPO Peel & Stick 6" RTS, JM TPO-Coated Metal, JM TPO Detail Membrane and JM Single Ply Caulk

2.3 AUXILIARY ROOFING SYSTEM COMPONENTS

- A. Expansion Joints: Provide factory fabricated weatherproof, exterior covers for expansion joint openings consisting of flexible rubber membrane, supported by a closed cell foam to form flexible bellows, with two metal flanges, adhesively and mechanically combined to the bellows by a bifurcation process. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Basis of Design: Expand-O-Flash
- B. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Trim."

2.4 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads sourced from membrane roofing system manufacturer. Basis of Design: JM TPO Walkpad

2.5 ROOF INSULATION

- A. General: Preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

- B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), Basis of Design: ENRGY 3
1. Provide insulation package with minimum R Value: 30.
 2. Provide insulation package in multiple layers.
 3. Minimum Long-Term Thermal Resistance (LTTR): 5.7 per inch.
 - a. Determined in accordance with CAN/ULC S770 at 75°F (24°C)

2.6 TAPERED INSULATION

- A. Tapered Insulation: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48), unless otherwise indicated. Basis of Design: Tapered ENRGY 3

2.7 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
- B. Provide factory preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated. Basis of Design: Diamondback Pre-Cut Cricket Diamondback Pre-Cut Miter Tapered Fesco Edge Strip
- C. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and furnished by roofing system manufacturer. Basis of Design: UltraFast Fasteners and Plates
- D. Wood Nailer Strips: Comply with requirements in Division 06 Section "Miscellaneous Rough Carpentry."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with the requirements affecting performance of roofing system.
1. General:
 - a. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
 - b. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
 2. Steel Decks:
 - a. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Division 05 Section "Steel Decking."
 3. Ensure general rigidity and proper slope for drainage.
 4. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.

- B. Unacceptable panels should be brought to the attention of the General Contractor and Project Owner's Representative and must be corrected prior to installation of roofing system.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to roofing installation in accordance with roofing system manufacturer's written instructions.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSULATION INSTALLATION

- A. Coordinate installation of roof system components so insulation and cover board is not exposed to precipitation or left exposed at the end of the workday.
- B. Comply with roofing system manufacturer's written instructions for installation of roof insulation and cover board.
- C. Install tapered insulation under area of roofing to conform to slopes indicated.
- D. Install insulation boards with long joints in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with like material.
- E. Install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.
- F. Trim surface of insulation boards where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- G. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
- H. Preliminarily Fastened Insulation for Mechanically Fastened Systems: Install insulation with fasteners at rate required by roofing system manufacturer or applicable authority, whichever is more stringent.
 - 1. Fasten top layer to resist uplift pressure at corners, perimeter, and field of roof.
- I. Proceed with installation only after unsatisfactory conditions have been corrected.

3.4 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.
- B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.
- C. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.

- D. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.
 - 1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.
 - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
 - 3. Remove and discard temporary seals before beginning work on adjoining roofing.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.5 MECHANICALLY FASTENED ROOFING MEMBRANE INSTALLATION

- A. Install roofing membrane over area to receive roofing in accordance with roofing system manufacturer's written instructions.
 - 1. Unroll roofing membrane and allow to relax before installing.
 - 2. Install sheet in accordance with roofing system manufacturer's written instructions.
- B. Accurately align roofing membranes and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- C. Mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.
- D. Always install membrane laps perpendicular to the steel deck flutes. "Picture Frame" installation method is not permitted.
- E. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- F. Seams: Clean seam areas, overlap roofing membrane, and hot-air weld side and end laps of roofing membrane according to manufacturer's written instructions to ensure a watertight seam installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane.
 - 2. Verify field strength of seams a minimum of twice daily and repair seam sample areas.
 - a. Remove and repair any unsatisfactory sections before proceeding with Work.
 - 3. Repair tears, voids, and lapped seams in roofing membrane that do not meet requirements.
- G. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.
- H. In-Splice Attachment: Secure one edge of roofing membrane using fastening plates or metal battens centered within membrane splice and mechanically fasten roofing membrane to roof deck. Field-splice seam.
- I. Install roofing membrane and auxiliary materials to tie in to existing roofing.
- J. Proceed with installation only after unsatisfactory conditions have been corrected.

3.6 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories and adhere to substrates according to membrane roofing system manufacturer's written instructions.
- B. Apply solvent-based bonding adhesive at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners per manufacturer's installation instructions.
- D. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.
- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.7 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products in locations indicated. Heat-weld walkway products to substrate according to roofing system manufacturer's written instructions.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's Registered Roof Observer (RRO) to inspect roofing installation on completion and submit report to Architect.
 - 1. Notify Architect or Owner 48 hours in advance of date and time of inspection.
- C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.9 PROTECTION AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075423

SECTION 07620 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manufactured reglets with counterflashing.
2. Formed roof-drainage sheet metal fabrications.
3. Formed low-slope roof sheet metal fabrications.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Distinguish between shop- and field-assembled work.
3. Include identification of finish for each item.
4. Include pattern of seams and details of termination points, expansion joints and expansion-joint covers, direction of expansion, roof-penetration flashing, and connections to adjoining work.

C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Product test reports.

C. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 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.

1. For copings and roof edge flashings that are SPRI ES-1 tested, shop shall be listed as able to fabricate required details as tested and approved.
- B. Mockups: Build mockups to verify selections made under Sample submittals to demonstrate aesthetic effects and to set quality standards for fabrication and installation.

1.6 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 1. Finish Warranty Period: 20 years from date of Final Completion.

PART 2 - PRODUCTS

2.1 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.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's The NRCA Roofing Manual requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested according to SPRI ES-1, meeting all applicable codes and capable of resisting the following design pressure:
 1. Design Pressure: Per current building codes.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 1. Temperature Change: 120 deg F (67 deg C), ambient; material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Metallic-Coated Steel Sheet: Provide aluminum-zinc alloy-coated steel sheet according to ASTM A 792/A 792M, Class AZ50 prepainted by coil-coating process to comply with ASTM A 755/A 755M.
 1. Exposed Coil-Coated Finish: Kynar 500

- A. Finish and color to match existing adjacent colors. Manufacturer's full range of colors shall be available for selection and custom color match may be required at no additional charge. Sheet metal shall match roof gutters/downspouts/flashing and metal panel system where adjacent.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 30 mils thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Carlisle Coatings & Waterproofing Inc.
 - b. Protecto Wrap Company.
 - c. SDP Advanced Polymer Products Inc.
 - 2. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F (116 deg C) or higher.
 - 3. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F (29 deg C) or lower.

2.4 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.
 - 1. General: Blind fasteners
 - a. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - 2. Fasteners for Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
- C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
- D. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

2.5 MANUFACTURED REGLETS

- A. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated with factory-mitered and -welded corners and junctions and with interlocking counterflashing on exterior face, of same metal as reglet.
 - 1. Material: Galvanized steel, 0.022 inch (0.56 mm) thick.
 - 2. Finish: Finish and color to match existing colors in multiple areas. Manufacturer's full range of colors shall be available for selection and custom color match may be required at no additional charge.

2.6 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 - 1. Obtain field measurements for accurate fit before shop fabrication.
 - 2. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 - 3. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
 - 2. Use lapped expansion joints only where indicated on Drawings.
- C. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- E. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- F. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

2.7 ROOF-DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- long sections. Furnish flat-stock gutter brackets and gutter spacers and straps fabricated from same metal as gutters, of size

recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters. Shop fabricated. Gutters finish and color to match existing colors in multiple areas. Manufacturer's full range of colors shall be available for selection and custom color match may be required at no additional charge.

- B. Downspouts: Fabricate rectangular downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors.
 - 1. Hanger Style: Straps with concealed flat seam and concealed fasteners
 - 2. Fabricate from the following materials:
 - a. Aluminum-Zinc Alloy-Coated Steel: 22 ga. finish and color to match existing colors in multiple areas. Manufacturer's full range of colors shall be available for selection and custom color match may be required at no additional charge.
- C. Parapet Scuppers: Fabricate scuppers to dimensions required, with closure flange trim to exterior, 4-inch- wide wall flanges to interior, and base extending 4 inches beyond cant or tapered strip into field of roof. Fabricate from the following materials:
 - 1. Aluminum-Zinc Alloy-Coated Steel: 22 ga thick, finish and color to match existing colors in multiple areas. Manufacturer's full range of colors shall be available for selection and custom color match may be required at no additional charge.

2.8 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

- A. Roof Edge Flashing Gravel Stop and Fascia Cap: Fabricate in minimum 96-inch long, but not exceeding 12-foot long sections. Furnish with 6-inch wide, joint cover plates. Shop fabricate interior and exterior corners.
 - 1. Fabricate from the Following Materials:
 - a. Aluminum-Zinc Alloy-Coated Steel: 22 ga thick.
 - b. Finish and color to match existing colors in multiple areas. Manufacturer's full range of colors shall be available for selection and custom color match may be required at no additional charge.
- B. Copings: Fabricate in minimum 96-inch long, but not exceeding 12-foot long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and interior leg. Miter corners, fasten and seal watertight. Shop fabricate interior and exterior corners. Flat seam, no exposed fasteners.
 - 1. Fabricate from the Following Materials:
 - a. Aluminum-Zinc Alloy-Coated Steel: 22 ga thick. Finish and color to match existing colors in multiple areas. Manufacturer's full range of colors shall be available for selection and custom color match may be required at no additional charge.
- C. Base Flashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
 - 1. Aluminum-Zinc Alloy-Coated Steel: 24 ga thick.

- D. Counterflashing and Flashing Receivers: Fabricate from the following materials:
1. Aluminum-Zinc Alloy-Coated Steel: 24 ga thick.

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.

3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
 2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 3. Space cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 5. Torch cutting of sheet metal flashing and trim is not permitted.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. 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.
- D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws, not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction. Prepare joints and apply sealants to comply with requirements in Section 07900 "Joint Sealants."
- G. Rivets: Rivet joints in uncoated aluminum where necessary for strength.

3.3 ROOF-DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters: Join sections with riveted joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.
1. Install gutter with expansion joints at locations not exceeding, 50 feet apart. Install expansion-joint caps.
- C. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at approximately 60 inches o.c.
- D. Parapet Scuppers: Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.
- E. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints minimum of 4 inches (100 mm) in direction of water flow.

3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate.

- C. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.
- D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches (100 mm) over base flashing. Install stainless-steel draw band and tighten.
- E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm).

3.5 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Through-Wall Flashing: Installation of through-wall flashing is specified in Section 04200 Unit Masonry.

3.6 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

END OF SECTION 07620

SECTION 07900 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes joint sealants for the applications indicated in the Joint-Sealant Schedule at the end of Part 3.
- B. Related Sections include the following:
 - 1. Division 4 Section "Unit Masonry Assemblies" for masonry control and expansion joint fillers and gaskets.
 - 2. Division 7 Section "Fire-Resistive Joint Systems" for sealing joints in fire-resistance-rated construction.
 - 3. Division 8 Section "Glazing" for glazing sealants.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. 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.
- C. Qualification Data: For Installer.
- D. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" Article.
- E. 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.

F. Field Test Report Log: For each elastomeric sealant application.

G. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.

H. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates as follows:

1. Locate test joints as directed by Architect.
2. Conduct field tests for each application indicated below:
 - a. Each type of elastomeric sealant and joint substrate indicated.
3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
5. Test Method: Test joint sealants according to the following hand pull method:
 - a. Install joint sealants in 5-foot joint lengths using same materials and methods for joint preparation and joint sealant installation required for completed work. Allow sealants to cure fully before testing.
 - b. Make knife cuts as follows: A horizontal cut from one side of joint to the other followed by 2 vertical cuts approximately 2 inches long at side of joint and meeting horizontal cut at top of 2 inch cuts. Place a mark 1 inch from top of 2 inch piece.
 - c. Use fingers to grasp 2 inch piece of sealant just above 1 inch mark; pull firmly down at a 90 degree angle or more while holding a ruler along side of sealant. Pull sealant out of joint to the distance recommended by sealant manufacturer for testing adhesive capability, but not less than that equaling specified maximum movement capability in extension; hold this position for 10 seconds.
 - d. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

A. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.

Evaluation of Preconstruction Field-Adhesion- Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

- D. Mockups: Build mockups incorporating sealant joints, as follows, to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:

1. Joints in mockups of assemblies specified in other Sections that are indicated to receive elastomeric joint sealants, which are specified by reference to this Section.

1.6 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 (5 deg C).
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.
5. Unless specifically indicated on the Drawings, no joints shall exceed W' and will be rejected by the Architect.

1.7 WARRANTY

- A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: 5 years from date of Final Completion.

- B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: 5 years from date of Final Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

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 sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

Generally, sealant colors shall match color of adjacent materials.

2.3 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Single-Component Neutral- and Basic-Curing Silicone Sealant **ES-1**:

1. Products:
 - a. Dow Corning Corporation; 790.
 - b. GE Silicones; SilPrufLM SCS2700.
 - c. Tremco; Spectrem 1 (Basic).
 - d. GE Silicones; SilPruf SCS2000.
 - e. Pecora Corporation; 864.
 - f. Pecora Corporation; 890.
 - g. Polymeric Systems Inc.; PSI-641.
 - h. Sonneborn, Division of ChemRex Inc.; Omniseal.
 1. Tremco; Spectrem 3.
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 50 or 100/150.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 - a. Use **O** Joint Substrates: Color anodic aluminum, aluminum coated with a high-performance coating, galvanized steel, brick, and wood.

C. Single-Component Mildew-Resistant Neutral-Curing or Acid Curing Silicone Sealant **ES-2**:

1. Products:
 - a. Dow Corning - 786.
 - b. Pecora Corporation; 898.
 - c. Tremco; Treinsil200 Sanitary.
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
 - a. Use **O** Joint Substrates: Ceramic tile.

D. Single-Component Nonsag Urethane Sealant **ES-3**:

1. Products:
 - a. Bostik Findley; Chem-Calk 900.
 - b. Bostik Findley; Chem-Calk 915.
 - c. Pecora Corporation; Dynatrol I-XL.
 - d. Polymeric Systems Inc.; PSI-901.

- e. Tremco; DyMonic.
 - 2. Type and Grade: S (single component) and NS (nonsag).
 - 3. Class: 25.
 - 4. Use Related to Exposure: NT (nontraffic).
 - 5. Uses Related to Joint Substrates: M, A, and, as applicable to joint substrates indicated, O.
 - a. Use **O** Joint Substrates: Color anodic aluminum, aluminum coated with a high-performance coating, and galvanized steel.
- E. Multicomponent Single Component Urethane Sealant **ES-4**:
- 1. Products:
 - a. Pecora Corp.; Dynatrol 1
 - b. Sika Corporation, Inc.; Sikaflex -1a
 - c. Tremco; Dymonic
 - d. Sherwin Williams: LOXON 1K Smooth (S1)
 - 2. Type and Grade: S (Singlecomponent) and NS (Nonsag). Use Nonsag on joints over ¾".
 - 3. Class: 12-1/2.
 - 4. Uses Related to Exposure: T (traffic) and NT (nontraffic).
 - 5. Uses Related to Joint Substrates: M, A.
- F. Single-Component Pourable Urethane Sealant **ES-5**:
- 1. Products:
 - a. Bostik Findley; Chem-Calk 950.
 - b. Pecora Corporation; Urexpan NR-201.
 - c. Polymeric Systems Inc.; Flexiprene 952.
 - d. Sonneborn, Division of ChemRex, Inc.; SL1.
 - e. Tremco; Tremflex SIL.
 - f. Tremco; Vulkem 45.
 - g. Sika Corporation, Inc.; Sikaflex - 1 CSL
 - 2. Type and Grade: S (single component) and P (pourable).
 - 3. Class: 25 or 50.
 - 4. Use Related to Exposure: T (traffic).
 - 5. Uses Related to Joint Substrates: M, and, as applicable to joint substrates indicated, O.

2.4 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type 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: ASTM C 1330, Type C (closed-cell material with a surface skin), unless not acceptable to the joint sealant manufacturer' for the joint application indicated and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - 1. If Manufacturer indicates a problem with the specified closed-cell material for the joint application, Contractor shall use backing recommended by the Manufacturers.

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.
- B. Proceed with installation only after unsatisfactory conditions have been corrected

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, blast cleaning, 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. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint

sealants. Nonporous joint substrates include the following:

- a. Metal.
- B. Joint Priming: Prime joint substrates based on preconstruction joint-sealant-substrate tests or prior experience. 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 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 type 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 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.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified 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 configuration per Figure SA in ASTM C 1193, unless otherwise indicated.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

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.

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.

3.6 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application JS-1: Exterior vertical and horizontal nontraffic construction joints in cast-in-place concrete.
 - 1. Joint Sealant: Single-component neutral- and basic-curing silicone sealant **ES-1**.
 - 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range to match color of concrete.
- B. Joint-Sealant Application JS-2: Exterior horizontal traffic isolation and contraction joints in cast-in-place concrete slabs.
 - 1. Joint Sealant: Single-component pourable urethane sealant **ES-5**.
 - 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range to match adjacent materials.
- C. Joint-Sealant Application JS-3: Exterior vertical and horizontal nontraffic joints between plant-precast architectural concrete units.
 - 1. Joint Sealant: Single-component neutral- and basic-curing silicone sealant **ES-1**.
 - 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range to match precast.
- D. Joint-Sealant Application JS-4: Exterior vertical control and expansion joints in unit masonry.
 - 1. Joint Sealant: Single-component neutral- and basic-curing silicone sealant **ES-1**.
 - 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range to match color of adjacent materials.
- E. Joint-Sealant Application JS-5: Exterior joints in exterior insulation and finish systems and/or direct applied exterior finish systems.
 - 1. Joint Sealant: Single-component neutral- and basic-curing silicone sealant **ES-1**.
 - 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range to match color of EIFSIDEFS systems.
- F. Joint-Sealant Application JS-6: Exterior vertical joints between different materials listed above.

1. Joint Sealant: Single-component neutral- and basic-curing silicone sealant **ES-1**.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range to match color of adjacent materials.
- G. Joint-Sealant Application JS-7: Exterior perimeter joints between unit masonry and/or precast and frames of doors windows and louvers.
1. Joint Sealant: Single-component neutral- and basic-curing silicone sealant **ES-1**.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range to match color of adjacent materials.
- H. Joint-Sealant Application JS-8: Vertical control and expansion joints and emu comers on interior walls up to a height of 10'-0" for pick resistance. Above 10'-0", use joint-sealant application JS-9.
1. Joint Sealant: Multicomponent nonsag pick resistant urethane sealant **ES-4**.
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range to match color of adjacent materials.
- I. Joint-Sealant Application JS-9: Vertical control and expansion joints and emu comers on interior walls above 10'-0". Use joint-sealant application JS-8 for joints below 10'-0".
- J. Joint Sealant: Single-component nonsag urethane sealant **ES-4**
- K. Joint-Sealant Color: As selected by Architect from manufacturer's full range to match color of adjacent materials.
- J. Joint-Sealant Application JS-10: Interior perimeter joints of openings.
1. Joint Sealant: Single-component non sag urethane sealant **ES-4**.
 2. Joint-Sealant Color: As selected by Architect. from manufacturer's full range to match color of adjacent materials.
- K. Joint-Sealant Application JS-11: Interior joints between plumbing fixtures and adjoining walls, floors, and counters.
1. Joint Sealant: Single-component mildew-resistant neutral-curing silicone sealant **ES-2**.
 2. Joint-Sealant Color: White
- L. Joint-Sealant Application JS-12: Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances, countertops and other materials not indicated elsewhere.
1. Joint Sealant: Single-component non-sag urethane sealant. **ES-4**
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range to match color of adjacent surfaces.
- M. Joint-Sealant Application JS-13: Interior exposed joints in horizontal traffic surfaces not covered elsewhere.
1. Joint Sealant: Single component pourable urethane sealant. **ES-5**
 2. Joint-Sealant Color: As selected by Architect from manufacturer's full range to match color of adjacent surfaces.

- N. Joint-Sealant Application JS-13: Interior exposed joints in horizontal traffic surfaces in Exposed Polished Concrete.
3. Joint Sealant: As recommended by Polished Concrete contractor.
 4. Joint-Sealant Color: As selected by Architect from manufacturer's full range to match color of adjacent surfaces.

END OF SECTION 07920

SECTION 08110 - STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes steel doors and frames.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 4 Section "Unit Masonry" for building anchors into and grouting frames in masonry construction.
 - 2. Division 8 Section "Flush Wood Doors" for hollow-core and solid-core wood doors installed in steel frames.
 - 3. Division 8 Section "Door Hardware" for door hardware and weatherstripping.
 - 4. Division 8 Section "Glazing" for glass in steel doors and sidelights.
 - 5. Division 9 Section "Painting" for field painting primed doors and frames.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.
- C. Shop Drawings showing fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
- D. Door Schedule: Submit schedule of doors and frames using same reference numbers for details and openings as those on Contract Drawings.
 - 1. Indicate coordination of glazing frames and stops with glass and glazing requirements.

1.4 QUALITY ASSURANCE

- A. Provide doors and frames complying with ANSI/SDI 100 "Recommended Specifications for Standard Steel Doors and Frames" and as specified.
- B. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies tested for fire-test-response characteristics per NFPA 252 for positive pressure, and are labeled and listed by UL, Warnock Hersey, or another testing and inspecting agency acceptable to authorities having jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.
- B. Inspect doors and frames on delivery for damage. Minor damages may be repaired provided refinished items match new work and are acceptable to Architect; otherwise, remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4-inch- (100-mm-) high wood blocking. Avoid using nonvented plastic or canvas shelters that could create a humidity chamber. If cardboard wrappers on doors become wet, remove cartons immediately. Provide minimum 1/4-inch (6-mm) spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Steel Doors and Frames:
 - a. Amweld Building Products, Inc.
 - b. Curries
 - c. Ceco Door Products.
 - d. Republic Builders Products.
 - e. Steelcraft.

2.2 MATERIALS

- A. Supports and Anchors: Fabricated from not less than 0.0478-inch- (1.2-mm-) thick steel sheet; 0.0516-inch- (1.3-mm-) thick galvanized steel where used with galvanized steel frames.
- B. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize complying with ASTM A 153, Class C or D as applicable.

2.3 DOORS

- A. Steel Doors: Provide 1-3/4-inch- (44-mm-) thick doors of materials and ANSI/SDI 100 grades and models specified below, or as indicated on Drawings or schedules:
 - 1. Interior Doors: SDI-100, Grade II, heavy duty, Model 1, Minimum 18-gauge faces.
 - 2. Exterior Doors: SDI-100, Grade III, extra heavy-duty, Model 2, Minimum 16-gauge faces.
- B. Door Louvers: Provide louvers according to SDI 111C for interior doors where indicated, with blades or baffles formed of 0.0239-inch- (0.6-mm-) thick cold-rolled steel sheet set into minimum 0.0359-inch- (0.9-mm-) thick steel frame.

2.4 FRAMES

- A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, according to ANSI/SDI 100, and of types and styles as shown on Drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 16 gauge thick cold-rolled steel sheet.
 - 1. Fabricate frames with mitered or coped and continuously welded corners.

2. Fabricate frames for interior openings over 48 inches (1220 mm) wide from 0.0598-inch- (1.5-mm-) thick steel sheet.
 3. Fabricate exterior frames for openings over 48 inches (1220 mm) wide from 0.0635-inch- (1.6-mm-) thick galvanized steel sheet.
 4. Form exterior frames from 0.0635-inch- (1.6-mm-) thick galvanized steel sheet.
 5. Provide grout tight mortar/junction boxes at the electric power transfers (EPT), and door monitor switch locations. Provide conduit from mortar boxes to a junction box inside of the building located above the ceiling. Provide screw on cover plates for future EPTs as scheduled. See applicable hardware sets in finish hardware section 08710 for specific locations.
- B. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.
- C. Plaster Guards: Provide minimum 0.0179-inch- (0.45-mm-) thick steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.
- D. Grout: When required in masonry construction, as specified in Division 4 Section "Unit Masonry."

2.5 FABRICATION

- A. Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site. Comply with ANSI/SDI 100 requirements.
1. Internal Construction: One of the following manufacturer's standard core materials according to SDI standards:
 - a. Resin-impregnated paper honeycomb.
 - b. Rigid polyurethane conforming to ASTM C 591.
 - c. Rigid polystyrene conforming to ASTM C 578.
 - d. Unitized steel grid.
 - e. Vertical steel stiffeners.
 - f. Rigid mineral fiber with internal sound deadener on inside of face sheets.
 2. Clearances: Not more than 1/8 inch (3.2 mm) at jambs and heads, except not more than 1/4 inch (6.4 mm) between non-fire-rated pairs of doors. Not more than 3/4 inch (19 mm) at bottom.
 - a. Fire Doors: Provide clearances according to NFPA 80.
- B. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel sheet.
- C. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."
- D. Fabricate concealed stiffeners, reinforcement, edge channels, louvers, and moldings from either cold- or hot-rolled steel sheet.
- E. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.
- F. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware according to final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of SDI 107 and ANSI A115 Series specifications for door and frame preparation for hardware.

1. Provide grout tight mortar/junction boxes at the electric power transfers (EPT), and door monitor switch locations. Provide conduit from mortar boxes to a junction box inside of the building located above the ceiling. Provide screw on cover plates for future EPTs as scheduled. See applicable hardware sets in finish hardware section 08710 for specific locations.
- G. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at Project site.
- H. Locate hardware as indicated on Shop Drawings or, if not indicated, according to the Door and Hardware Institute's (DHI) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
- I. Glazing Stops: Minimum 0.0359-inch- (0.9-mm-) thick steel or 0.040-inch- (1-mm-) thick aluminum.
1. Provide nonremovable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.
 2. Provide screw-applied, removable, glazing beads on inside of glass, louvers, and other panels in doors.

2.6 FINISHES, GENERAL

- A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
1. Shop Primer: Manufacturer's standard, fast-drying, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.
- B. Comply with NAAMM's "Metal Finishes Manual" for recommendations relative to applying and designating finishes.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install steel doors, frames, and accessories according to Shop Drawings, manufacturer's data, and as specified.
- B. Placing Frames: Comply with provisions of SDI 105, unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
1. Except for frames located in existing concrete, masonry, or gypsum board assembly construction, place frames before constructing enclosing walls and ceilings.
 2. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.
 3. Install fire-rated frames according to NFPA 80.
- C. Door Installation: Fit hollow-metal doors accurately in frames, within clearances specified in ANSI/SDI 100.
1. Fire-Rated Doors: Install with clearances specified in NFPA 80.
 2. Smoke-Control Doors: Comply with NFPA 105.

3.2 ADJUSTING AND CLEANING

- A. Prime Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
- B. Protection Removal: Immediately before final inspection, remove protective wrappings from doors and frames.

END OF SECTION 08110

SECTION 08330 - ROLLING SERVICE DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Insulated rolling service doors.

1.2 RELATED SECTIONS

- A. Section 16130 - Raceway and Boxes: Conduit from electric circuit to door operator and from door operator to control station.
- B. Section 16150 - Wiring Connections: Power to disconnect.

1.3 REFERENCES

- A. ANSI/DASMA 108 - American National Standards Institute Standard Method For Testing Sectional Garage Doors And Rolling Doors: Determination Of Structural Performance Under Uniform Static Air Pressure Difference.
- B. NFRC 102 - Test Procedure for Measuring the Steady-State Thermal Transmittance of Fenestration Systems.
- C. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Element.
- D. ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- E. ASTM A 653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- F. ASTM A 666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- G. ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- H. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- I. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- J. NEMA MG 1 - Motors and Generators.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.
- B. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Details of construction and fabrication.
 - 4. Installation instructions.
- C. Shop Drawings: Include detailed plans, elevations, details of framing members, anchoring methods, required clearances, hardware, and accessories. Include relationship with adjacent construction.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- G. Operation and Maintenance Data: Submit lubrication requirements and frequency, and periodic adjustments required.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.
- B. Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
- C. Store materials in a dry, warm, ventilated weathertight location.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.9 COORDINATION

- A. Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

1.10 WARRANTY

- A. Warranty: Manufacturer's limited door and operator system, except the counterbalance spring and finish, to be free from defects in materials and workmanship for 3 years or 20,000 cycles, whichever occurs first.
- B. Warranty: Manufacturer's limited door system warranty for 2 years for all parts and components.
- C. PowderGuard Finish
 - 1. PowderGuard Premium Applied to curtain, guides, bottom bar, headplates: Manufacturer's limited Premium Finish warranty for 2 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design:: Overhead Door Corporation. Web Site: www.overheaddoor.com.
- B. Requests for substitutions will be considered in accordance with provisions of Section 00020.

2.2 INSULATED ROLLING SERVICE DOORS

- A. Stormtite Advanced Performance Insulated Rolling Service Doors: Overhead Door Corporation Stormtite AP Model 627.
 - 1. Curtain: Interlocking roll-formed slats as specified following. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
 - a. Flat profile type FIT-265 for doors up to 40 feet (12.19 m) wide.
 - b. Front slat fabricated of:
 - 1) 24 gauge galvanized steel.
 - c. Back slat fabricated of:
 - 1) 24 gauge galvanized steel.
 - d. Slat cavity filled with CFC-free foamed-in-place, polyurethane insulation.
 - 1) R-Value: 10.9, U-Value: 0.09.
 - 2. Performance:

- a. Through Curtain Sound Rating: Sound Rating: STC-28 (STC-30+ with HZ noise generator) as per ASTM E 90.
 - b. Installed System Sound Rating: STC-21 as per ASTM E 90.
 - c. U-factor: 0.84 NFRC test report, maximum U-factor of no higher than 1.00.
 - d. Air Infiltration: Meets ASHRAE 90.1 and IECC 2012/2015 C402.4.3 Air leakage <1.00 cfm/ft².
3. Slats and Hood Finish:
- a. Galvanized Steel: Slats and hood galvanized in accordance with ASTM A 653 and receive rust-inhibitive, roll coating process, including 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester top coat.
 - 1) Powder Coat:
 - (a) PowderGuard Premium powder coat color as selected by the Architect.
 - 2) Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.
 - b. Stainless Steel: Slats and hood shall be stainless steel finished as follows.
 - 1) Finish: No. 4 satin finish.
 - c. Aluminum: Slats and hood shall be aluminum finished as follows.
 - 1) Finish: Powder Coat:
 - (a) PowderGuard Premium powder coat color as selected by the Architect.
4. Weatherseals:
- a. Vinyl bottom seal and internal hood seals.
 - b. Interior and exterior EPDM triple-seal finned guide weatherseal.
 - c. Lintel weatherseal.
 - d. Air Infiltration Package: IECC 2012/2015 listed; product to meet C402.4.3 2012 Air leakage <1.00 cfm/ft².
 - 1) Air infiltration perimeter seal package includes: guide cover, guide cap, PVC weatherseal on exterior of guide, EPDM triple finned weatherseal on interior of guide, lintel weatherseal and vinyl bottom seal.
5. Bottom Bar:
- a. Two powder coated black steel angles minimum thickness 1/8 inch (3 mm) bolted back to back to reinforce curtain in the guides.
6. Guides: Three structural steel angles.
7. Brackets:
- a. Hot rolled powder coated black steel to support counterbalance, curtain and hood.
8. Finish; Guides, Headplate and Brackets:
- a. PowderGuard Premium powder coat in black color.
9. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03 inch per foot of span. Counterbalance is adjustable by means of an adjusting tension wheel.
10. Hood: Provide with internal hood baffle weatherseal.
- a. 24 gauge galvanized steel with intermediate supports as required.
11. Electric Motor Operation: Provide UL listed electric operator, size as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.
- a. Sensing Edge Protection: .
 - 1) Electric sensing edge.
 - b. Operator Controls:
 - 1) Push-button operated control stations with open, close, and stop buttons.

- 2) Controls for interior location.
 - 3) Controls flush mounted.
 - c. Special Operation:
 - d. Motor Voltage: 115/230 single phase, 60 Hz.
- 12. Wind Load Design:
 - a. Standard wind load shall be 20 PSF.
- 13. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.
- 14. Locking:
 - a. Interior slide bolt lock for electric operation with interlock switch.
- 15. Wall Mounting Condition:
 - a. Face-of-wall mounting.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes, tolerances and conditions are acceptable.
- B. Examine conditions of substrates, supports, and other conditions under which this work is to be performed.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.
- E. Coordinate installation of electrical service with Electrical Documents. Complete wiring from disconnect to unit components.
- F. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07900.

- G. Install perimeter trim and closures.
- H. Instruct Owner's personnel in proper operating procedures and maintenance schedule.

3.4 ADJUSTING

- A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

- A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.
- B. Remove labels and visible markings.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 PROTECTION

- A. Protect installed products until completion of project.

END OF SECTION

SECTION 08332 - ROLLING COUNTER DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Rolling Counter Doors, manually operated.

1.2 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Details of construction and fabrication.
 - 4. Installation methods.
- B. Shop Drawings: Include detailed plans, elevations, details of framing members, required clearances, anchors, and accessories. Include relationship with adjacent construction.
- C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product, color, and patterns.
- E. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.
- B. Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.
- C. Store materials in a dry, warm, ventilated weathertight location.

1.5 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.6 COORDINATION

- A. Coordinate Work with other operations and installation of adjacent finish materials to avoid damage to installed materials.

1.7 WARRANTY

- A. Warranty: Manufacturer's limited door warranty for 2 years for all parts and components.
- B. PowderGuard Finish.
 - 1. PowderGuard Premium Applied to curtain, guides, bottom bar, headplates: Manufacturer's limited Premium Finish warranty for 2 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Overhead Door Corporation. Series 650
- B. Requests for substitutions will be considered in accordance with provisions of Section 00020.

2.2 ROLLING STEEL COUNTER DOORS

- A. Galvanized Steel Counter Doors: Overhead Door Corporation, 650 Series.
 - 1. Wall Mounting Condition:
 - 2.
 - a. Face-of-wall mounting.
 - b.
 - 3. Curtain: Interlocking slats, Type F-158 fabricated of 22 gauge galvanized steel. Endlocks attached to alternate slats to maintain curtain alignment and prevent lateral slat movement.
 - 4. Finish:
 - a. Slats and hood galvanized steel in accordance with ASTM A 653 with rust-inhibitive, roll coating process, including 0.2 mils thick baked-on prime paint, and 0.6 mils thick baked-on polyester (powder coated) top coat.
 - 1) Powder Coat:
 - (a) PowderGuard Premium powder coat, color as selected by the Architect.
 - b.
 - 5. Bottom Bar:

- a. Steel tubular locking bottom bar with weatherstrip.
 - b.
- 6. Guides: Extruded aluminum.
- 7. Brackets: Steel plate to support counterbalance, curtain and hood.
- 8. Finish; Bottom Bar, Guides, Brackets:
 - a.
 - b. Finish: PowderGuard Premium powder coat, color as selected by the Architect.
- 9. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel.
- 10. Hood: Provided with intermediate support brackets as required and fabricated of:
 - a. Galvanized primed steel.
- 11. Operation:
 - a. Manual push up.
 - b. Operator Controls:
- 12. Locking:
 - a. Slide bolt locks suitable for use with padlock.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify opening sizes, tolerances and conditions are acceptable.
- B. Examine conditions of substrates, supports, and other conditions under which this work is to be performed.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

- E. Coordinate installation of sealants and backing materials at frame perimeter.
- F. Install perimeter trim and closures.

3.4 ADJUSTING

- A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

- A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.
- B. Remove labels and visible markings.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

3.6 PROTECTION

- A. Protect installed products until completion of project.

3.7 Schedule:

- A. Provide counter shutters at the following locations:
 - 1. Window Type "A"
 - 2. Window lite at Door Frame "F2"

END OF SECTION

SECTION 08411 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes: Architectural Aluminum Storefront Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of storefront units.
 - 1. Basis of design: Kawneer Aluminum Storefront Systems include:
 - a. Trifab® 451UT Storefront System – 2" x 4-1/2" (50.8 mm x 114.3 mm) nominal dimension; Thermal; Center Plane, Screw Spline Fabrication.
 - b. Other manufacturers subject to the requirements of this specification:
 - 1) EFCO Corporation
 - 2) Old Castle
 - 3) YKK
- B. Related Sections:
 - 1. "Air Barriers" for materials used to bridge between aluminum storefront system and building intersection.
 - 2. "Fire-Resistant Joint systems" for fire resistive material installed between aluminum storefront system and floor intersections.
 - 3. "Joint Sealants" for joint sealants installed as part of the aluminum storefront system.
 - 4. "Sloped Glazing Assemblies".

1.3 DEFINITIONS

- A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).

1.4 PERFORMANCE REQUIREMENTS

- A. General Performance: Aluminum-framed storefront system shall withstand the effects of the following performance requirements without exceeding performance criteria or failure due to defective manufacture, fabrication, installation, or other defects in construction:
 - 1. Design Wind Loads: Determine design wind loads applicable to the Project from basic wind speed indicated in miles per hour, according to ASCE 7, Section 6.5, "Method 2-Analytical Procedure," based on mean roof heights above grade indicated on Drawings. System must be designed to withstand windloads as determined by applicable local, state and federal building codes.

B. Storefront System Performance Requirements:

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 10 psf (479 Pa) as defined in AAMA 501.
3. Uniform Load: A static air design load of 30 psf (1436 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. Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than:
 - a. $U = 0.39 \text{ BTU/hr/ft}^2/\text{°F}$.
5. Solar Heat Gain Coefficient (SHGC): Provide aluminum windows with a whole-window SHGC maximum of 0.38
5. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than:
 - a. 68_{frame} and 68_{glass} (low-e).
6. Condensation Resistance (I): When tested to CSA A-440, the condensation index shall not be less than:
 - a. 60_{frame} and 62_{glass} (low-e).
7. Sound Transmission Class (STC) and Outdoor-Indoor Transmission Class (OITC): When tested to AAMA Specification 1801 and in accordance with ASTM E1425 and ASTM E90, the STC and OITC Rating shall not be less than:
 - a. 37 (STC) and 30 (OITC).

1.5 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, coordination of doors and hardware, finishes, and installation instructions for each type of aluminum frame storefront system indicated. Field verify each opening prior to fabrication.
- B. Shop Drawings: Include plans, elevations, sections, details, coordination of doors and hardware, and attachments to other work, operational clearances and installation details.
- C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
- D. Samples for Verification: For aluminum framed storefront system and components required.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency for each type of aluminum-framed storefront.
- F. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum-framed systems, made from 12" (300 mm) lengths of full-size components and showing details of the following:

1. Joinery, including concealed welds.
2. Anchorage.
3. Expansion provisions.
4. Glazing.
5. Flashing and drainage.

G. Other Action Submittals:

1. Entrance Door Hardware Schedule: Coordinate door prep with hardware supplied by others.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.
- B. Manufacturer Qualifications: A manufacturer capable of providing aluminum framed storefront system that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
- C. Source Limitations: Obtain aluminum framed storefront system and Aluminum Curtain Wall Systems through one source from a single manufacturer.
- D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum framed storefront system and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements." Do not modify size and dimensional requirements.
1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- E. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Build mockup for type(s) of storefront elevation(s) indicated, in location(s) shown on Drawings.
- F. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination".

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of aluminum framed storefront openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

1.8 WARRANTY

- A. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty.
1. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product:

1. Kawneer Company Inc.
2. Trifab® 451UT (thermal) Storefront System
3. 2" x 4-1/2" (50.8 mm x 114.3 mm) System Dimensions
4. Glass: Center Plane

B. Substitutions:

1. Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.
2. Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for storefront system performance criteria, and (2) has been engaged in the design, manufacture and fabrication of aluminum storefronts for a period of not less than ten (10) years. (Company Name)
3. Test Reports: Submit test reports verifying compliance with each test requirement required by the project.
4. Samples: Provide samples of typical product sections and finish samples in manufacturer's standard sizes.

2.2 MATERIALS

- A. Aluminum Extrusions: Alloy and temper recommended by aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.
- B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.
- C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
- E. Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
- F. 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.

2.3 STOREFRONT FRAMING SYSTEM

A. Thermal Barrier (Trifab® VG 451UT):

1. Kawneer DUAL IsoLock® Thermal Break with two (2) 1/4" (6.4 mm) separations consisting of a two-part chemically curing, high-density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections.
 - a. Thermal Break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.
 - B. Trifab Versoleil SunShade: An aluminum sunshade (consisting of outriggers, louvers, and fascia, Blade style shall be "Airfoil" that is anchored directly to the vertical mullions. Outriggers shall be shop painted to match storefront system. Louvers and fascia shall be painted or anodized to match storefront system.
 - C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
 - D. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.
 - E. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
 - F. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - G. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.
- 2.4 GLAZING SYSTEMS
- A. Glazing: As specified in Division 08 Section "Glazing".
 - B. Glazing Gaskets: Manufacturer's standard compression types; replaceable, extruded EPDM rubber.
 - C. Spacers and Setting Blocks: Manufacturer's standard elastomeric type.
 - D. Bond-Breaker Tape: Manufacturer's standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.
 - E. Glazing Sealants: As recommended by manufacturer for joint type.
- 2.5 ENTRANCE DOOR SYSTEMS
- A. Kawneer 500 Standard Entrance. Finish to match frame. Coordinate with Door Hardware Schedule.
- 2.6 ACCESSORY MATERIALS
- A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 07 Section "Joint Sealants".
 - B. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30 mil (0.762 mm) thickness per coat.

2.7 FABRICATION

- A. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fit joints; make joints flush, hairline and weatherproof.
 - 3. Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.
 - 4. Physical and thermal isolation of glazing from framing members.
 - 5. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 6. Provisions for field replacement of glazing.
 - 7. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- B. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- C. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.
- D. Storefront Framing: Fabricate components for assembly using manufactures standard installation instructions.
- E. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

- A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.
- C. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.
- D. Factory Finishes: Kawneer Permafluor (70%), AAMA 2605, Fluoropolymer Coating. Architect to select from a full range of colors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall

flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight sliding door installation.

1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
2. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
3. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing aluminum framed storefront system, accessories, and other components.
- B. Install aluminum framed storefront system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- C. Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.
- D. Install aluminum framed storefront system and components to drain condensation, water penetrating joints, and moisture migrating within frame to the exterior.
- E. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 FIELD QUALITY CONTROL

- A. Field Tests: Architect shall select storefront units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer's representative present. Tests not meeting specified performance requirements and units having deficiencies shall be corrected as part of the contract amount.
 1. Testing: Testing shall be performed by a qualified independent testing agency. Refer to Testing Section for payment of testing and testing requirements. Testing Standard per AAMA 503, including reference to ASTM E 783 for Air Infiltration Test and ASTM E 1105 Water Infiltration Test.
 - a. Air Infiltration Tests: Conduct tests in accordance with ASTM E 783. Allowable air infiltration shall not exceed 1.5 times the amount indicated in the performance requirements or 0.09 cfm/ft², whichever is greater.
 - b. Water Infiltration Tests: Conduct tests in accordance with ASTM E 1105. No uncontrolled water leakage is permitted when tested at a static test pressure of two-thirds the specified water penetration pressure but not less than 6.24 psf (300 Pa).
- B. Manufacturer's Field Services: Upon Owner's written request, provide periodic site visit by manufacturer's field service representative.

3.4 ADJUSTING, CLEANING, AND PROTECTION

- A. Clean aluminum surfaces immediately after installing aluminum framed storefronts. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- B. Clean glass immediately after installation. Comply with glass manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.
- C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 08410

SECTION 08710 - DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Hardware for wood, aluminum, and hollow metal doors.
- B. Hardware for fire-rated doors.
- C. Electrically operated and controlled hardware.
- D. Lock cylinders for doors with balance of hardware specified in other sections.
- E. Thresholds.
- F. Weatherstripping and gasketing.

1.02 RELATED REQUIREMENTS

- A. Section 061000 - Rough Carpentry
- B. Section 079200 - Joint Sealants
- C. Section 081416 - Flush Wood Doors.
- D. Section 083613 - Sectional Doors
- E. Section 084313 - Aluminum-Framed Storefronts: Door hardware, except as noted in section.
- F. Section 260519 - Low-Voltage Electrical Power Conductors and Cables
- G. Section 281000 - Access Control

1.03 REFERENCE STANDARDS

- A. ADA Standards - 2010 ADA Standards for Accessible Design 2010.
- B. BHMA A156.1 - Standard for Butts and Hinges 2021.
- C. BHMA A156.2 - Bored and Preamsembled Locks and Latches 2022.
- D. BHMA A156.3 - Exit Devices 2020.
- E. BHMA A156.4 - Door Controls - Closers 2019.
- F. BHMA A156.5 - Cylinders and Input Devices for Locks 2020.
- G. BHMA A156.6 - Standard for Architectural Door Trim 2021.
- H. BHMA A156.7 - Template Hinge Dimensions 2016.
- I. BHMA A156.16 - Auxiliary Hardware 2018.
- J. BHMA A156.21 - Thresholds 2019.
- K. BHMA A156.22 - Standard for Gasketing 2021.
- L. BHMA A156.26 - Standard for Continuous Hinges 2021.
- M. BHMA A156.28 - Standard for Recommended Practices for Mechanical Keying Systems 2018.
- N. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames 2016.
- O. BHMA A156.115W - Hardware Preparation in Wood Doors with Wood or Steel Frames 2006.
- P. DHI (H&S) - Sequence and Format for the Hardware Schedule 2019.
- Q. DHI (KSN) - Keying Systems and Nomenclature 2019.
- R. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames 2004.
- S. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
- T. ITS (DIR) - Directory of Listed Products Current Edition.

- U. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- V. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.
- W. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives 2022.
- X. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2022.
- Y. UL (DIR) - Online Certifications Directory Current Edition.
- Z. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.
- AA. UL 1034 - Standard for Safety Burglary-Resistant Electrical Locking Mechanisms Current Edition, Including All Revisions.
- BB. UL 1784 - Standard for Air Leakage Tests of Door Assemblies Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.
- B. Sequence installation to ensure facility services connections are achieved in an orderly and expeditious manner.
- C. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; require attendance by affected installers and the following:
 - 1. Architect.
 - 2. Installer's Architectural Hardware Consultant (AHC).
 - 3. Hardware Installer.
 - 4. Owner's Security Consultant.
- D. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- E. Keying Requirements Meeting:
 - 1. Attendance Required:
 - 2. Agenda:
 - a. Establish keying requirements.
 - b. Verify locksets and locking hardware are functionally correct for project requirements.
 - c. Verify that keying and programming complies with project requirements.
 - d. Establish keying submittal schedule and update requirements.
 - 3. Incorporate decisions from Keying Requirements Meeting into keying submittal upon review of door hardware keying system including, but not limited to, the following:
 - a. Access control requirements.
 - b. Key control system requirements.
 - c. Schematic diagram of preliminary key system.
 - d. Flow of traffic and extent of security required.
 - 4. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.
 - 5. Deliver established keying requirements to manufacturers.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.
- C. Shop Drawings - Door Hardware Schedule: A detailed listing that includes each item of hardware to be installed on each door.

1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
 2. Comply with DHI (H&S) using door numbering scheme and hardware set numbers as indicated in Contract Documents.
 - a. Submit in vertical format.
 3. List groups and suffixes in proper sequence.
 4. Include complete description for each door listed.
 5. Include manufacturer's and product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
 6. Include account of abbreviations and symbols used in schedule.
- D. Shop Drawings - Electrified Door Hardware: Include diagrams for power, signal, and control wiring for electrified door hardware that include details of interface with building safety and security systems. Provide elevations and diagrams for each electrified door opening as follows:
1. Prepared by or under supervision of Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC).
 2. Elevations: Include front and back elevations of each door opening showing electrified devices with connections installed and an operations narrative describing how opening operates from either side at any given time.
 3. Diagrams: Include point-to-point wiring diagrams that show each device in door opening system with related colored wire connections to each device.
- E. Samples for Verification:
1. Submit minimum size of 2 by 4 inch (51 by 102 mm) for sheet samples, and minimum length of 4 inch (102 mm) for other products.
 2. Submit one (1) sample of hinge, lockset, and closer illustrating style, color, and finish.
 3. Include product description with samples.
- F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- G. Manufacturer's qualification statement.
- H. Installer's qualification statement.
- I. Supplier's qualification statement.
- J. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
1. Include manufacturer's parts lists and templates.
- K. Keying Schedule:
1. Submit three (3) copies of Keying Schedule in compliance with requirements established during Keying Requirements Meeting unless otherwise indicated.
- L. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- M. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.
- N. Maintenance Materials and Tools: Furnish the following for Owner's use in maintenance of project.
1. See Section 016000 - Product Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

- A. Standards for Fire-Rated Doors: Maintain one copy of each referenced standard on site, for use by Architect and Contractor.
- B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified for commercial door hardware with at least three years of documented experience.

- D. Supplier Qualifications: Company with certified Architectural Hardware Consultant (AHC) to assist in work of this section.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

1.08 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Manufacturer Warranty: Provide manufacturer warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion. Complete forms in Owner's name and register with manufacturer.
 - 1. Closers: Twenty-five years, minimum.
 - 2. Exit Devices: Three years, minimum.
 - 3. Locksets: Ten years, minimum.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.
- B. Provide individual items of single type, of same model, and by same manufacturer.
- C. Closers:
 - 1. Provide door closer on each exterior door, unless otherwise indicated.
 - 2. Provide door closer on each fire-rated and smoke-rated door.
 - 3. Spring hinges are not an acceptable self-closing device, unless otherwise indicated.
- D. Drip Caps: Provide at head of outswinging exterior doors unless protected by roof or canopy directly overhead. Size drip caps 4 inches greater than opening width.
- E. Weatherstripping and Gasketing:
 - 1. Provide weatherstripping on each exterior door at head and jambs.
 - 2. Provide door bottom sweep on each exterior door.
- F. Electrically Operated and/or Controlled Hardware: Provide necessary power supplies, power transfer hinges, relays, and interfaces as required for proper operation; provide wiring between hardware and control components and to building power connection in compliance with NFPA 70.
- G. See Section 281000 for additional access control system requirements.
- H. Fasteners:
 - 1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
 - a. Aluminum fasteners are not permitted.
 - b. Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.
 - 2. Provide machine screws for attachment to reinforced hollow metal and aluminum frames.
 - 3. Provide stainless-steel machine screws and lead expansion shields for attaching hardware to concrete and masonry walls.
 - 4. Provide stainless-steel machine screws and lead expansion shields for attaching hardware to concrete and masonry walls.
 - 5. Provide stainless-steel TAP-Con screws attaching thresholds to concrete and masonry substrates.
 - 6. Provide wall grip inserts for hollow wall construction.
 - 7. Fire-Resistance-Rated Applications: Comply with NFPA 80.
 - a. Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.

- b. Provide steel through bolts for attachment of surface mounted closers, hinges, or exit devices to door panels unless proper door blocking is provided.

2.02 PERFORMANCE REQUIREMENTS

- A. Provide door hardware products that comply with the following requirements:
 - 1. Applicable provisions of federal, state, and local codes.
 - 2. Accessibility: ADA Standards and ICC A117.1.
 - 3. Fire-Resistance-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
 - 4. Hardware on Fire-Resistance-Rated Doors: Listed and classified by UL (DIR), ITS (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for application indicated.
 - 5. Hardware for Smoke and Draft Control Doors (Indicated as "S" on Drawings): Provide door hardware that complies with local codes, and requirements of assemblies tested in accordance with UL 1784.
 - 6. Hardware Preparation for Steel Doors and Steel Frames: BHMA A156.115.
 - 7. Hardware Preparation for Wood Doors with Wood or Steel Frames: BHMA A156.115W.
 - 8. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified.

2.03 HINGES

- A. Manufacturers:
 - 1. Conventional Butt Hinges:
 - a. BEST; dormakaba Group: www.bestaccess.com
 - b. McKinney.
 - c. PBB.
 - 2. Continuous Hinges:
 - a. BEST; dormakaba Group: www.bestaccess.com
 - b. Architectural Builders Hardware Mfg. Inc. (ABH).
 - c. SELECT Products Limited.
- B. Properties:
 - 1. Butt Hinges: As applicable to each item specified.
 - a. Standard Weight Hinges: Minimum of two (2) permanently lubricated non-detachable bearings.
 - b. Heavy Weight Hinges: Minimum of four (4) permanently lubricated bearings on heavy weight hinges.
 - c. Template screw hole locations.
 - d. Bearing assembly installed after plating.
 - e. Bearings: Exposed fully hardened bearings.
 - f. Bearing Shells: Shapes consistent with barrels.
 - g. Pins: Easily seated, non-rising pins.
 - 1) Fully plate hinge pins.
 - 2) Non-Removable Pins (NRP): Slotted stainless-steel screws.
 - (a) Omit NRP feature on in-swing doors.
 - h. NFPA 80 compliant for fire-rated doors.
 - 2. Continuous Hinges: As applicable to each item specified.
 - a. Geared Continuous Hinges: As applicable to each item specified.
 - 1) Non-handed.
 - 2) Anti-spinning through-fastener.
 - 3) UL 10C listed for fire-resistance-rated doors.
 - (a) Metal Door Installation: Rated up to 90 minutes.
 - (b) Wood Door Installation: Rated up to 60 minutes.
 - 4) Sufficient size to permit door to swing 180 degrees.

- C. Finishes: See Door Hardware Schedule.
- D. Grades:
 - 1. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7 for templated hinges.
 - 2. Continuous Hinges: Comply with BHMA A156.26, Grade 1.
- E. Material: Base metal as indicated for each item by BHMA material and finish designation.
- F. Types:
 - 1. Butt Hinges: Include full mortise hinges.
 - 2. Continuous Hinges: Include geared, edge mounted hinges.
- G. Options: As applicable to each item specified.
- H. Quantities:
 - 1. Butt Hinges: Three (3) hinges per leaves up to 90 inches (2286 mm) in height. Add one (1) for each additional 30 inches (762 mm) in height or fraction thereof.
 - a. Hinge weight and size unless otherwise indicated in hardware sets:
 - 1) For doors up to 36 inches (914 mm) wide and up to 1-3/4 inches (44.5 mm) thick provide hinges with a minimum thickness of 0.134 inch (3.4 mm) and a minimum of 4-1/2 inches (114 mm) in height.
 - 2) For doors from 36 inches (914 mm) wide up to 42 inches (1067 mm) wide and up to 1-3/4 inches (44.5 mm) thick provide hinges with a minimum thickness of 0.145 inch (3.7 mm) and a minimum of 4-1/2 inches (114 mm) in height.
 - 3) For doors from 42 inches (1067 mm) wide up to 48 inches (1219 mm) wide and up to 1-3/4 inches (44.5 mm) thick provide hinges with a minimum thickness of 0.180 inch (4.6 mm) and a minimum of 5 inches (127 mm) in height.
 - 4) For doors greater than 1-3/4 inches (44.5 mm) thick provide hinges with a minimum thickness of 0.180 inch (4.6 mm) and a minimum of 5 inches (127 mm) in height.
 - 2. Continuous Hinges: One per door leaf.
 - a. Hinge size unless otherwise indicated in hardware sets: 1" less than nominal door height.
- I. Applications: At swinging doors.
 - 1. Provide non-removable pins at out-swinging doors with locking hardware and all exterior doors.
- J. Products:
 - 1. Butt Hinges:
 - a. Ball Bearing, Five (5) Knuckle.
 - b. Provide swinging doors with hinges from one approved manufacturer as follows:

<u>BEST</u>	<u>McKinney</u>	<u>PBB</u>
FBB179	TB2714	BB81
FBB168	T4B3786	4B81
FBB199	T4B3386	4B51
 - 2. Continuous Hinges:
 - a. Provide 1 3/4" thick swinging doors with approved aluminum geared hinges according to frame material as follows:

	<u>ABH</u>	<u>BEST</u>	<u>SELECT</u>
Aluminum Frames	A110HD	661HD	SL11HD
Hollow Metal Frames	A111HD	667HD	SL18HD

2.04 EXIT DEVICES

- A. Manufacturers:
 - 1. BEST, dormakaba Group: www.bestaccess.com/#sle.
 - 2. Von Duprin

- B. Properties:
1. Actuating portion: Push pad according to BHMA A156.03.
 2. Chassis:
 - a. Construction: Investment cast steel, zinc dichromate plated.
 - b. Compatibility: Wide Stile and Narrow Stile doors.
 3. Size:
 - a. The actuating portion of the releasing device shall extend not less than one-half of the door leaf width.
 - b. Channel length shall be sized according to door width. The length shall achieve the manufacturer's recommended clearance between exit device and hinge jamb, based on door width, backset, frame stop, and soffit mounted hardware.
 4. Latch Bolts: Stainless steel deadlocking with 3/4 inch (19 mm) projection using latch bolt.
 5. Lever Design: Match project standard lockset trims.
 6. Cylinder: Include where cylinder dogging or locking trim is indicated.
 7. Strike as recommended by manufacturer for application indicated.
 8. Sound dampening touch bar operation.
 9. Dogging:
 - a. Non-Fire-Resistance-Rated Devices: Cylinder dogging.
 - b. Fire-Resistance-Rated Devices: Manual dogging not permitted.
 10. Touch bar assembly on wide style exit devices to have a 1/4 inch (6.3 mm) clearance to allow for vision frames.
 11. All exposed exit device components to be of architectural metals and comply with the indicated BHMA finish.
 12. Handing: Field-reversible.
 13. Conceal fasteners on back side of device channel.
- C. Grades: Complying with BHMA A156.3, Grade 1.
1. Provide exit devices tested and certified by UL or by a recognized independent laboratory for mechanical operational testing to 10 million cycles minimum with inspection confirming Grade 1 Loaded Forces have been maintained.
 2. Provide type 1, rim exit devices for single doors.
- D. Standards Compliance:
1. UL Listed for Panic.
 2. Provide UL (DIR) listed exit device assemblies for fire-resistance-rated doors.
 3. Comply with UL 10C.
- E. Products:
1. Provide approved exit devices and trims from one approved manufacturer as follows:

	<u>BEST</u>	<u>Sargent</u>	<u>Von Duprin</u>
a. Exit Device	3R0 2100 Series	8800 Series with option 19	98 Series
b. Exit Device Trim	4900 Series	700 Series ET Trim	996 Series

2.05 ELECTRIC STRIKES

- A. Manufacturers:
1. RCI; dormakaba Group: www.dormakaba.com/us-en/#sle.
- B. Properties:
1. Provide UL (DIR) listed burglary-resistant devices.
 2. Provide UL 1034 compliant devices.
 3. Provide UL 10C compliant devices.
 4. Non-handed devices suitable for door frame material and scheduled lock configuration.
 5. Include transformer and rectifier as necessary for complete installation.
 6. Holding Force: 1,500 lbs (680.4 kg).
 7. Accommodating latch projections of 1/2 inch (13 mm) or 5/8 inch (16 mm).
- C. Options: As applicable to each item specified.

1. Voltage: Field-Selectable 12/24VDC..
 2. Latch bolt monitor.
- D. Installation: Connect electric strikes into fire alarm where non-rated doors are scheduled to release with fire or sprinkler alarm condition.
- E. Products:
1. Provide electric strikes according to corresponding locking device as follows:
 - a. 0162 LM Series
 - 1) Locking Device: Rim exit device
 - b. 2164 Series x F2LM.
 - 1) Locking Device: Cylindrical lockset
 - c. S6504 LM Series:
 - 1) Locking Device: Storefront door deadlatch
 2. Furnish the following accessories to aid in field-prep of storefront frames receiving S6504 electric strike:
 - a. Template Kit: RCI model# SMT-01.
 - b. Strike Jig: RCI model# S6JIG.
 - c. Trim Plate: RCI model# TP-S6

2.06 LOCK CYLINDERS

- A. Manufacturers:
1. dormakaba; dormakaba Group: www.dormakaba.com/us-en/#sle.
- B. Properties:
1. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
 - a. Provide cylinders from same manufacturer as locking device.
 - b. Provide cams and/or tailpieces as required for locking devices.
 - c. Provide cylinders with appropriate format interchangeable cores where indicated.
- C. Grades:
1. Comply with BHMA A156.5.
- D. Material:
1. Manufacturer's standard corrosion-resistant brass alloy.
- E. Types: As applicable to each item specified.
1. Provide full size interchangeable core (FSIC) type cylinders, with six-pin keyed-alike construction cores and SC keyways.
- F. Applications: At locations indicated in hardware sets, and as follows
1. For items with locking devices provided by other sections, including at cabinets.
 - a. When provisions for lock cylinders are referenced elsewhere in the Project Manual to this Section, provide compatible type of lock cylinder, keyed to building keying system, unless otherwise indicated.
- G. Products:
1. Rim/mortise: Dormakaba 83 R/ 93 R Series..
 2. Construction Core: Dormakaba model# 73 BLK TMP.
 3. Permanent Core: Same as Owner's existing FSIC system.

2.07 CYLINDRICAL LOCKS

- A. Manufacturers:
1. BEST, dormakaba Group: www.bestaccess.com/#sle.
- B. Properties:
1. Mechanical Locks:
 - a. Fitting modified ANSI A115.2 door preparation.
 - b. Door Thickness Fit: 1-3/4 inches (44.45 mm) to 2-1/4 inches (57 mm) thick doors.

- c. Construction: Hub, side plate, shrouded rose, locking pin to be a one-piece casting with a shrouded locking lug.
 - 1) Through-bolted anti-rotational studs.
- d. Cast stainless-steel latch retractor with roller bearings for exceptionally smooth operation and superior strength and durability.
- e. Bored Hole: 2-1/8 inch (54 mm) diameter.
- f. Backset: 2-3/4 inches (70 mm) unless otherwise indicated.
- g. Latch: Single piece tail-piece construction.
 - 1) Latchbolt Throw: 9/16 inch (14.3 mm), minimum.
- h. Cylinders:
 - 1) Cylinder Core Types: Locks capable of supporting manufacturers' cores, as applicable.
 - (a) FSIC.
- i. Lever Trim:
 - 1) Style: See Door Hardware Schedule.
 - 2) Functionality: Allow the lever handle to move up to 45 degrees from horizontal position prior to engaging the latchbolt assembly.
 - 3) Strength: Locksets outside locked lever designed to withstand minimum 1,400 inch-lbs (158.2 Nm) of torque. In excess of that, a replaceable part will shear. Key from outside and/or inside lever will still operate lockset.
 - 4) Independent spring mechanism for each lever.
 - (a) Contain lever springs in the main lock hub.
 - 5) Outside Lever Sleeve: Seamless one-piece construction.
- C. Finishes: See Door Hardware Schedule.
- D. Grades: Comply with BHMA A156.2, Grade 1, Series 4000, Operational Grade 1, Extra Heavy Duty.
 - 1. Durability: Passing 50 million cycle tests verified by third party testing agency.
- E. Material:
 - 1. Critical Latch and Chassis Components: Brass or corrosion-resistance treated steel.
 - 2. Outside Lever Sleeve: Hardened steel alloy.
- F. Options:
- G. Products:
 - 1. Provide locks from one of the approved manufacturers as follows:

	<u>Function</u>	<u>BEST</u>	<u>Schlage</u>	<u>Sargent</u>
a.	F75 Passage	9K-0N	ND10S	10XU15
b.	F76 Privacy	9K-0L	ND40S	10XU65
c.	F84 Classroom	9K-0R x SCHRC	ND70JD	SF 10XG37
d.	F86 Storeroom	9K-0D x SCHRC	ND80JD	SF 10XG04

2.08 DEADLATCHES

- A. Manufacturers:
 - 1. Adams Rite.
- B. Properties:
 - 1. Door Thickness Fit: 1-3/4 inches minimum.
 - 2. Cases:
 - a. Material: Steel with corrosion-resistant plating.
 - b. Depth: Varies, commensurate with backset dimension. 2-9/64" maximum.
 - 3. Backset: 1-1/2 inch (38.1 mm).
 - 4. Latch: Single piece construction.
 - a. Throw: 5/8 inch (15.9 mm).
 - 5. Auxiliary Deadlatch: One-piece stainless-steel pin.

6. Cylinders: Provide mortise cylinder.
7. Faceplates: Manufacturer's standard for lock selected and door edge condition.
8. Trim: Provide heavy duty deadlatch handle for egress.
 - a. Lever Design: See Hardware Schedule
 - b. Handed as indicated on Drawings.
 - c. Compatible with deadlatch and door thickness.
- C. Products:
 1. Deadlatch: Adams Rite 4900 Series.
 2. Lever Handle Trim: Adams Rite 4600 Series.

2.09 DOOR PULLS

- A. Manufacturers:
 1. Trimco: www.trimcohardware.com/#sle.
- B. Properties:
 1. Pull Type: Offset, unless otherwise indicated.
 2. Compatible with indicated door thickness.
 3. Center-to-center: As indicated in Hardware Sets.
 4. Fastener-type: As indicated in Hardware Sets.
- C. Grades: Comply with BHMA A156.6.
- D. Material: Aluminum, unless otherwise indicated.
- E. Products:
 1. Trimco AP221 Series

2.10 CLOSERS

- A. Manufacturers:
 1. BEST, dormakaba Group www.bestaccess.com/#sle.
 2. Dormakaba Commerical
 3. LCN
- B. Properties:
 1. Surface Mounted Closers: Manufacturer's standard.
 - a. Construction: Single piece casted cast iron.
 - b. Maximum Projection from Face of Door: 2-7/16 inches (62 mm).
 - c. Mechanism: Separate, tamper-resistant, retention ring, self-regulating adjusting valves for closing and latching speeds, backcheck, advanced variable backcheck.
 - 1) All valve adjustment socket screw drives must be slotted hex not requiring special tools for maintenance or adjustments.
 - 2) Spring adjustment screw must be hex key.
 - 3) All valves must have mechanism to prevent oil leaks from over adjustment.
 - 4) All closer adjustments must be front facing and adjustable without removing closer from installed surface.
 - 5) Hydraulic Fluid: All-weather type.
 - 6) Arm Assembly:
 - (a) Construction: Stamped arms and forged hub.
 - (b) Material: Steel.
 - (c) Include hold-open, integral stop, or spring-loaded stop feature, as specified in Door Hardware Schedule. Omit hold-open arm at rated doors.
 - (d) Parallel arm to be a heavy-duty rigid arm.
 - (e) Where "IS" or "S-IS" arms are specified in hardware sets, if manufacturer does not offer this arm provide a regular arm mount closer in conjunction with a heavy-duty overhead stop equal to a dormakaba 900 Series.
 - 7) Covers:
 - (a) Type:

- (1) Full.
 - (b) Material: Plastic.
 - (c) Finish: Painted.
 - (d) Attachment: Two-point flange mounting, dual-clamp friction fit closer cover.
- C. Grades:
 - 1. Closers: Comply with BHMA A156.4, Grade 1.
 - a. Underwriters Laboratories Compliance:
 - 1) Product Listing: UL (DIR) and ULC for use on fire-resistance-rated doors.
 - (a) UL 228 - Door Closers-Holders, With or Without Integral Smoke Detectors.
 - b. Testing Standards Compliance: Meeting requirements of UL 10C for positive pressure.
- D. Types:
 - 1. Rack-and-pinion, surface-mounted.
- E. Additional Requirements:
 - 1. Provide closers with the following features:
 - a. Advanced variable backcheck.
 - 1) Selectable adjustment to facilitate degree of backcheck engagement point:
 - (a) Parallel arm mount: 50 degrees.
 - (b) Regular arm and top jamb mount: Between 50 and 80 degrees.
 - (c) Intensity of backcheck shall be fully adjustable with tamper resistant non-critical valve screw.
- F. Installation:
 - 1. Mounting: Includes surface mounted installations.
 - 2. Mount closers on non-public side of door and stair side of stair doors unless otherwise noted in hardware sets.
 - 3. At outswinging exterior doors, mount closer on interior side of door.
 - 4. Provide adapter plates, shim spacers, and blade stop spacers as required by frame and door conditions.
 - a. Consult factory for non-standard templating.
- G. Products:
 - 1. Provide closers from one of the approved manufacturers as follows:

<u>BEST</u>	<u>Sargent</u>
a. EHD9000 Series	281 Series with ABC option

2.11 PROTECTION PLATES

- A. Manufacturers:
 - 1. Trimco: www.trimcohardware.com/#sle.
- B. Properties:
 - 1. Plates:
 - a. Kick Plates: Provide along bottom edge of push side of every door with closer, except aluminum storefront.
 - 1) Size: 10 inches high and 2 inches less than door width (LDW).
 - b. Mop Plates: Provide along bottom edge of pull side of doors to provide protection from cleaning liquids and equipment damage to door surface.
 - 1) Size: 6 inches high and 1 inch LDW.
 - c. Edges: Beveled on four edges (B4E).
- C. Grades: Comply with BHMA A156.6.
- D. Material: As indicated for each item by BHMA material and finish designation.
 - 1. Metal Properties: Stainless steel.
 - a. Metal, Standard Duty: Thickness 0.050 inch (1.27 mm), minimum.
- E. Installation:

- 1. Fasteners: Countersunk screw fasteners
- F. Products:
 - 1. Kick Plates: Trimco K0050 Series.
 - 2. Mop Plates: Trimco KM050 Series.

2.12 STOPS AND HOLDERS

- A. Manufacturers:
 - 1. Trimco: www.trimcohardware.com/#sle.
- B. General: Provide overhead stop/holder when wall or floor stop is not feasible.
- C. Grades:
 - 1. Wall Bumpers: Comply with BHMA A156.16 and Resilient Material Retention Test as described in this standard.
- D. Material: Base metal as indicated for each item by BHMA material and finish designation.
- E. Types:
 - 1. Wall Bumpers: Bumper, concave, wall stop.
- F. Installation:
 - 1. Non-Masonry Walls: Confirm adequate wall reinforcement has been installed to allow lasting installation of wall bumpers.
- G. Products:
 - 1. Wall Bumpers:
 - a. Provide Trimco model#1270WV.
 - 2. Rugged Door Stop:
 - a. Provide Trimco model# 1298 at door 205.

2.13 THRESHOLDS

- A. Manufacturers:
 - 1. National Guard Products, Inc: www.ngpinc.com/#sle.
- B. Properties:
 - 1. Threshold Surface: Fluted horizontal grooves across full width.
 - 2. Typical Wall Thickness: 0.162 inch.
- C. Grades: Thresholds: Comply with BHMA A156.21.
- D. Material: Base metal as indicated for each item by BHMA material and finish designation.
- E. Types: As applicable to project conditions. Provide barrier-free type at every location where specified.
 - 1. Saddle Thresholds: Without thermal break.
- F. Products:
 - 1. NGP 425 Series

2.14 WEATHERSTRIPPING AND GASKETING

- A. Manufacturers:
 - 1. National Guard Products, Inc: www.ngpinc.com/#sle.
- B. Properties:
 - 1. Weatherstripping Air Leakage Performance: Not exceeding 3.0 cubic feet per minute per square foot of door opening at 0.10 inch (24.9 Pa) of water for both the ambient temperature test and the elevated temperature exposure test in accordance with UL1784.
 - 2. Adhesive-Backed Perimeter Gasketing: Silicone gasket material applied to frame with self-adhesive.
 - 3. Rigid, Housed, Perimeter Gasketing: Silicone bulb gasket material held in place by aluminum housing; fastened to frame stop with screws.
 - 4. Door Sweeps: Neoprene gasket material held in place by flat aluminum housing or flange; surface mounted to face of door with screws.

- C. Grades: Comply with BHMA A156.22.
- D. Products:
 - 1. Provide products manufactured by NGP as follows:
 - a. Drip Cap: Model# 16A
 - b. Gasketing: Model# 2525 C
 - c. Weatherstrip: Model# 160 SA
 - d. Door Sweep: Model# 200 NA

2.15 MISCELLANEOUS ITEMS

- A. Manufacturers:
 - 1. Don-Jo
 - 2. RCI
 - 3. Trimco: www.trimcohardware.com/#sle.
- B. Properties:
 - 1. Latch Protectors: Provide on door to protect latch from being tampered with while in locked position.
 - a. Type: Concealed fasteners.
 - b. Material: Stainless steel.
 - 2. Silencers: Provide at equal locations on door frame to mute sound of door's impact upon closing.
 - a. Single Door: Provide three on strike jamb of frame.
 - b. Pair of Doors: Provide two on head of frame, one for each door at latch side.
 - c. Material: Rubber, gray color.
- C. Products:
 - 1. Latch Protectors:
 - a. Provide Don-Jo CLP-110 except where RCI 2 Series and RCI 6 Series occur.
 - b. Provide RCI 940-LG where RCI 2 Series and RCI 6 Series occur.
 - 2. Silencers: Provide Trimco 1229 Series.

2.16 POWER SUPPLIES

- A. Products:
 - 1. Power Supplies: See Section 281000

2.17 KEYS AND CORES

- A. Manufacturers:
 - 1. Construction Key System:
 - a. dormakaba; dormakaba Group: www.dormakaba.com
 - 2. Permanent Key System:
 - a. Same as Owner's existing key system.
- B. Properties: Complying with guidelines of BHMA A156.28.
 - 1. Provide large format interchangeable core.
 - 2. Provide keying information in compliance with BHMA A156.28 standards.
 - 3. Keying Schedule: Arrange for a keying meeting, with Architect, Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying complies with project requirements.
 - 4. Keying: Comply with the Owner-approved key schedule..
 - 5. Include construction keying and control keying with removable core cylinders.
 - 6. Supply keys in following quantities:
 - a. New Master Keys: As directed by Owner but no more than 10 total keys.
 - b. Construction Keys: 15 each.
 - c. Construction Control Keys: 2 each.
 - d. Control Keys if New System: 2 each.
 - e. Change Keys: As directed by Owner but no more than 100 total keys.

7. Provide key collection envelopes, receipt cards, and index cards in quantity suitable to manage number of keys.
 8. Deliver keys with identifying tags to Owner by security shipment direct from manufacturer.
 9. Permanent Keys and Cores: Stamped with applicable key marking for identification. Do not include actual key cuts within visual key control marks or codes. Stamp permanent keys "Do Not Duplicate."
 10. Include installation of permanent cores and return construction cores to hardware supplier. Construction cores and keys to remain property of hardware supplier.
- C. Products:
1. Construction Core: Dormakaba model# 73 BLK TMP
 2. Construction Control Key: Dormakaba model# 45405 SC BLK TMP
 3. Construction Core Key: Dormakaba model# 45101 SC BLK TMP

2.18 KEY CABINETS

- A. Manufacturers:
1. Hudson Lock, LLC (HPC)
- B. Properties:
1. Key Management System: For each keyed lock on project, provide one set of consecutively numbered duplicate key tags with hanging hole and bright nickel-plated snap hook.
 2. Provide key collection envelopes, receipt cards, and index cards in quantity suitable to manage number of keys.
 3. Mounting: Wall surface mounted.
 4. Capacity: 90 keys minimum.
 5. Key cabinet lock to facility's keying system.
- C. Finishes: Baked enamel, manufacturer's standard color.
- D. Material: Sheet steel.
- E. Products:
1. Cabinet: KEKAB-KK Series
 2. Software: KeyTrail #KT-CD

2.19 FINISHES

- A. Finishes: Provide hardware in compliance with BHMA A156.18 according to the following finish codes:
1. 622: Construction Cores.
 2. 626:
 - a. Cylindrical Locksets.
 - b. Exit Device Trims.
 - c. Rugged Door Stops.
 3. 628:
 - a. Continuous Hinges.
 - b. Deadlatches.
 - c. Offset Door Pulls.
 - d. Drip Caps.
 - e. Weatherstrips Retainers.
 - f. Door Sweep Retainers.
 4. 630:
 - a. Stainless-steel Hinges.
 - b. Exit Devices.
 - c. Electric Strikes.
 - d. Kick Plates.
 - e. Wall Stops.

- f. Deadlatch lever handles.
 - g. Latch Protectors.
 - h. Latch Guards.
- 5. 652: Interior Hinges except at door 205.
- 6. 689: Surface Door Closers.
- 7. 719: Thresholds.
- B. Exceptions:
 - 1. Aluminum Surface Trim and Gasket Housings: Anodized to match door panel finish, not other hardware, unless otherwise indicated.
 - 2. Hardware for Aluminum Storefront Doors: Finished to match door panel finish, except at hand contact surfaces provide stainless-steel with satin finish.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.
- B. Correct all defects prior to proceeding with installation.
- C. Verify that electric power is available to power operated devices and of correct characteristics.

3.02 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Install hardware using the manufacturer's fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.
- C. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.
- D. Install hardware for smoke and draft control doors in accordance with NFPA 105.
- E. Use templates provided by hardware item manufacturer.
- F. Do not install surface mounted items until application of finishes to substrate are fully completed.
- G. Wash down masonry walls and complete painting or staining of doors and frames.
- H. Complete finish flooring prior to installation of thresholds.
- I. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item.
 - 1. For Steel Doors and Frames: Install in compliance with DHI (LOCS) recommendations.
 - 2. For Aluminum-Framed Storefront Doors and Frames: See Section 084313.
 - 3. Flush Wood Doors: See Section 081416.
 - 4. Mounting heights in compliance with ICC A117.1:
 - a. Locksets: 40-5/16 inch (1024 mm).
 - b. Door Pulls: 42 inch (1067 mm).
 - c. Exit Devices: 40-5/16 inch (1024 mm).
- J. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless-steel countersunk screws.
 - 1. See Section 079200 for additional requirements.
- K. Include in installation for existing doors and frames any necessary field modification and field preparation of doors and frames for new hardware. Provide necessary fillers, reinforcements, and fasteners for mounting new hardware and to cover existing door and frame preparations.

3.03 FIELD QUALITY CONTROL

- A. Perform field inspection and testing under provisions of Section 014000 - Quality Requirements.

- B. Provide an Architectural Hardware Consultant (AHC) to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified.

3.04 ADJUSTING

- A. Adjust work under provisions of Section 017000 - Execution and Closeout Requirements.
- B. Adjust hardware for smooth operation.
- C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.05 CLEANING

- A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.
- B. Clean adjacent surfaces soiled by hardware installation activities.
- C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.
- D. See Section 017419 - Construction Waste Management and Disposal, for additional requirements.

3.06 PROTECTION

- A. Protect finished Work under provisions of Section 017000 - Execution and Closeout Requirements.
- B. Do not permit adjacent work to damage hardware or finish.

3.07 SCHEDULES

- A. Scheduled Manufacturers:
 1. Adams Rite (AD)
 2. Best Access Systems (BE)
 3. Don-Jo (DJ)
 4. Dorma Door Controls (DM)
 5. HPC Hudson Lock (HPC)
 6. National Guard (NGP)
 7. BEST Precision Exit Devices (PR)
 8. RCI (RC)
 9. BEST Hinges and Sliding (ST)
 10. Trimco (TR)
- B. Hardware Sets:

Set #01

Doors: 105, 116

1	Continuous Hinge	667HD UL	AL	ST
1	Exit Device	3RO 2103 X 4903D CD	630	PR
1	Mortise Cylinder (CD)	93 R D 02 00 112	626	DM
1	Rim Cylinder (Trim)	93 R G 01 00 112	626	DM
2	Construction Core	73 BLK TMP	626	DM
2	Permanent Core	Match Existing FSIC System	626	
1	Electric Strike	0162LM	32D	RC
1	Closer	EHD9016 SDS90	689	BE
1	Kick Plate	K0050 B4E CSK	630	TR
1	Latch Protector	CLP-110	630	DJ
1	Drip Cap	16 A		NGP
1	Head & Jambs Weatherstrip	160 SA		NGP
1	Door Sweep	200 NA		NGP

1	Saddle Threshold	425 1/4 X 1 3/4" TAP-CON	AL	NGP
1	Card Reader	SECTION 281000		
1	Power Supply	SECTION 281000		

NOTE:

Door is normally closed and locked.

Presenting valid credential to card reader momentarily releases strike for entry.

Upon loss of power the door remains locked.

Free egress at all times by inside exit device.

Latching status is monitored by access control/security panels.

Set #02

Doors: 103

1	Continuous Hinge	667HD UL	AL	ST
1	Exit Device	3RO 2103 X 4903D CD S300	630	PR
1	Mortise Cylinder (CD)	93 R D 02 00 112	626	DM
1	Rim Cylinder (Trim)	93 R G 01 00 112	626	DM
2	Construction Core	73 BLK TMP	626	DM
2	Permanent Core	Match Existing FSIC System	626	
1	Closer	EHD9016 SDS90	689	BE
1	Kick Plate	K0050 B4E CSK	630	TR
1	Latch Protector	CLP-110	630	DJ
1	Drip Cap	16 A		NGP
1	Head & Jambs Weatherstrip	160 SA		NGP
1	Door Sweep	200 NA		NGP
1	Saddle Threshold	425 1/4 X 1 3/4" TAP-CON	AL	NGP

Set #03

Doors: 104

3	Butt Hinge	FBB168 4.5" x 4.5"	26D	ST
1	Fire Exit Device	3RO FL 2108 X 4908D S300	630	PR
1	Rim Cylinder (Trim)	93 R G 01 00 112	626	DM
1	Construction Core	73 BLK TMP	626	DM
1	Permanent Core	Match Existing FSIC System	626	
1	Closer	EHD9016	689	BE
1	Kick Plate	K0050 B4E CSK	630	TR
1	Wall Bumper	1270WV	630	TR
1	Head & Jambs Gasketing	2525 C		NGP

Set #04

Doors: 201

3	Butt Hinge	FBB168 4.5" x 4.5"	26D	ST
1	Passage Set	9K3-0N14D S3	626	BE
1	Closer	EHD9016	689	BE
1	Kick Plate	K0050 B4E CSK	630	TR
1	Wall Bumper	1270WV	630	TR
1	Head & Jambs Gasketing	2525 C		NGP

Set #05

Doors: 113, 115

3	Butt Hinge	FBB168 5" X 4.5" NRP	26D	ST
1	Storeroom Lockset	9K3-0D14D SCHRC	626	BE

1	Construction Core	73 BLK TMP	626	DM
1	Permanent Core	Match Existing FSIC System	626	
1	Latchbolt Monitor	F2LM	28	RC
1	Electric Strike	F2164	32D	RC
1	Closer	EHD9016 SIS90	689	BE
1	Kick Plate	K0050 B4E CSK	630	TR
1	Head & Jambs Gasketing	2525 C		NGP
1	Card Reader	SECTION 281000		
1	Power Supply	SECTION 281000		

NOTE:

Door is normally closed and locked.

Presenting valid credential to card reader momentarily releases strike for entry.

Upon loss of power the door remains locked.

Free egress at all times by inside lever.

Latching status is monitored by access control/security panels.

Set #06

Doors: 114

1	Continuous Hinge	667HD UL	AL	ST
1	Storeroom Lockset	9K3-0D14D SCHRC	626	BE
1	Construction Core	73 BLK TMP	626	DM
1	Permanent Core	Match Existing FSIC System	626	
1	Latchbolt Monitor	F2LM	28	RC
1	Electric Strike	F2164	32D	RC
1	Closer	EHD9016 SDS90	689	BE
1	Kick Plate	K0050 B4E CSK	630	TR
1	Latch Guard	940-LG	32D	RC
1	Drip Cap	16 A		NGP
1	Head & Jambs Weatherstrip	160 SA		NGP
1	Door Sweep	200 NA		NGP
1	Saddle Threshold	425 1/4 X 1 3/4" TAP-CON	AL	NGP
1	Card Reader	SECTION 281000		
1	Power Supply	SECTION 281000		

NOTE:

Door is normally closed and locked.

Presenting valid credential to card reader momentarily releases strike for entry.

Upon loss of power the door remains locked.

Free egress at all times by inside lever.

Latching status is monitored by access control/security panels.

Set #07

Doors: 106

1	Continuous Hinge	661HD UL	AL	ST
1	Deadlatch	4900 1 1/2"BS	628	AD
1	Mortise Cylinder	93 R G 01 00 112	630	DM
1	Construction Core	73 BLK TMP	626	DM
1	Permanent Core	Match Existing FSIC System	626	
1	Electric Strike	S6504 LM	32D	RC
1	Door Pull	AP221N-12	628	TR
1	Lever Handle	4600-01-01-02	US32D	AD
1	Closer	EHD9016 SIS90 BP90	689	BE

1	Latch Guard	940-LG	32D	RC
1	Head & Jambs Weatherstrip	SECTION 084113		
1	Sweep	SECTION 084113		
1	Threshold	SECTION 084113		
1	Card Reader	SECTION 281000		
1	Power Supply	SECTION 281000		
1	Template Kit	SMT-01	28	RC
1	Strike Jig	S6JIG	28	RC
1	Trim Plates	TP-S6	BLACK	RC

NOTE:

Door is normally closed and locked.

Presenting valid credential to card reader momentarily releases strike for entry.

Upon loss of power the door remains locked.

Free egress at all times by inside lever.

Latching status is monitored by access control/security panels.

Set #08

Doors: 109

3	Butt Hinge	FBB168 5" X 4.5" NRP	26D	ST
1	Storeroom Lockset	9K3-0D14D SCHRC	626	BE
1	Construction Core	73 BLK TMP	626	DM
1	Permanent Core	Match Existing FSIC System	626	
1	Latchbolt Monitor	F2LM	28	RC
1	Electric Strike	F2164	32D	RC
1	Closer	EHD9016	689	BE
1	Kick Plate	K0050 B4E CSK	630	TR
1	Wall Bumper	1270WV	630	TR
3	Silencer	1229A	GREY	TR
1	Card Reader	SECTION 281000		
1	Power Supply	SECTION 281000		

NOTE:

Door is normally closed and locked.

Presenting valid credential to card reader momentarily releases strike for entry.

Upon loss of power the door remains locked.

Free egress at all times by inside lever.

Latching status is monitored by access control/security panels.

Set #09

Doors: 112

3	Butt Hinge	FBB179 4.5" x 4.5"	26D	ST
1	Storeroom Lockset	9K3-0D14D S3 SCHRC	626	BE
1	Construction Core	73 BLK TMP	626	DM
1	Permanent Core	Match Existing FSIC System	626	
1	Closer	EHD9016 SIS90	689	BE
1	Kick Plate	K0050 B4E CSK	630	TR
1	Head & Jambs Gasketing	2525 C		NGP

Set #10

Doors: 205

3	Hinges	FBB199 5" x 5" NRP	32D	ST
1	Storeroom Lockset	9K3-0D14D S3 SCHRC	626	BE

1	Construction Core	73 BLK TMP	626	DM
1	Permanent Core	Match Existing FSIC System	626	
1	Closer	EHD9016	689	BE
1	Kick Plate	K0050 B4E CSK	630	TR
1	Rugged Door Stop	1298	626	TR
1	Head & Jambs Gasketing	2525 C		NGP

Set #11

Doors: 101

1	Continuous Hinge	667HD UL	AL	ST
1	Storeroom Lockset	9K3-0D14D S3 SCHRC	626	BE
1	Construction Core	73 BLK TMP	626	DM
1	Permanent Core	Match Existing FSIC System	626	
1	Closer	EHD9016 SDS90	689	BE
1	Kick Plate	K0050 B4E CSK	630	TR
1	Latch Protector	CLP-110	630	DJ
1	Drip Cap	16 A		NGP
1	Head & Jambs Weatherstrip	160 SA		NGP
1	Door Sweep	200 NA		NGP
1	Saddle Threshold	425 1/4 X 1 3/4" TAP-CON	AL	NGP

Set #12

Doors: 107

3	Butt Hinge	FBB168 4.5" x 4.5" NRP	26D	ST
1	Classroom Lockset	9K3-0R14D S3 SCHRC	626	BE
1	Construction Core	73 BLK TMP	626	DM
1	Permanent Core	Match Existing FSIC System	626	
1	Wall Bumper	1270WV	630	TR
3	Silencer	1229A	GREY	TR

Set #13

Doors: 102

3	Butt Hinge	FBB168 4.5" x 4.5" NRP	26D	ST
1	Classroom Lockset	9K3-0R14D S3 SCHRC	626	BE
1	Construction Core	73 BLK TMP	626	DM
1	Permanent Core	Match Existing FSIC System	626	
1	Closer	EHD9016 SDS90	689	BE
1	Kick Plate	K0050 B4E CSK	630	TR
3	Silencer	1229A	GREY	TR

Set #14

Doors: 108, 203, 204

3	Butt Hinge	FBB168 4.5" x 4.5" NRP	26D	ST
1	Storeroom Lockset	9K3-0D14D S3 SCHRC	626	BE
1	Construction Core	73 BLK TMP	626	DM
1	Permanent Core	Match Existing FSIC System	626	
1	Closer	EHD9016	689	BE
1	Kick Plate	K0050 B4E CSK	630	TR
1	Wall Bumper	1270WV	630	TR
3	Silencer	1229A	GREY	TR

Set #15

Doors: 202

3	Butt Hinge	FBB168 4.5" x 4.5" NRP	26D	ST
1	Storeroom Lockset	9K3-0D14D S3 SCHRC	626	BE
1	Construction Core	73 BLK TMP	626	DM
1	Permanent Core	Match Existing FSIC System	626	
1	Closer	EHD9016 SDS90	689	BE
1	Kick Plate	K0050 B4E CSK	630	TR
3	Silencer	1229A	GREY	TR

Set #16

Doors: 110, 111

3	Butt Hinge	FBB168 4.5" x 4.5" NRP	26D	ST
1	Privacy Set	9K3-0L14D S3	626	BE
1	Closer	EHD9016	689	BE
1	Mop Plate	KM050 B4E CSK	630	TR
1	Kick Plate	K0050 B4E CSK	630	TR
1	Wall Bumper	1270WV	630	TR
3	Silencer	1229A	GREY	TR

Set #17

Doors: 117

1	Construction Core	73 BLK TMP	626	DM
1	Permanent Core	Match Existing FSIC System	626	
1	Cylinder	As Required	626	DM

NOTE:

Balance of hardware by door manufacturer.

Set #18

ADDITIONAL MATERIALS

2	Construction Control Key	45405 SC BLK TMP		DM
15	Construction Key	45101 SC BLK TMP		DM
10	Master Key	As Required		
100	Change Keys	As Required		
1	Key Cabinet	KEKAB-60-KK		HPC
1	Construction Core	73 BLK TMP	626	DM
1	Permanent Core	Match Existing FSIC System	626	
1	Cylinder	93 R K 01 00 112	626	DM
1	Key Control Software	KT-CD		HPC

Set #19

3	Butt Hinge	FBB168 4.5" x 4.5"	26D	ST
1	Fire Exit Hardware	3RO FL 2114 X 4914D S300	630	PR
1	Closer	EHD9016	689	BE
1	Kick Plate	K0050 B4E CSK	630	TR
1	Wall Bumper	1270WV	630	TR
1	Head & Jambs Gasketing	2525 C		NGP

END OF SECTION

SECTION 08800 – GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Furnish all labor materials, tools, equipment, and services for Glazing. Provide all miscellaneous items, appurtenances and devices, incidental to or necessary for a sound, secure and complete installation.

1.2 SUMMARY

- A. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 - 1. Windows.
 - 2. Doors.
 - 3. Glazed entrances.
 - 4. Interior borrowed lites.

1.3 DEFINITIONS

- A. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.
- B. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.
- C. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass

framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.5 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Samples: For the following products, in the form of 12-inch- (300-mm-) square Samples for glass and of 12-inch- (300-mm-) long Samples for sealants. Install sealant Samples between two strips of material representative in color of the adjoining framing system.
- C. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
- D. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- E. Product Data: For each glass product and glazing material indicated.

LEED Submittals:

1. Product Data for Credit IEQ 4.1: For glazing sealants used inside the weatherproofing system, documentation including printed statement of VOC content.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Source Limitations for Glass: Obtain clear float glass from one primary-glass manufacturer.
- C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.
- D. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 257.
- E. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201 and ANSI Z97.1.
- F. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following inspecting and testing agency:

1. Insulating Glass Certification Council.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 1. Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 40 deg F (4.4 deg C).

1.9 WARRANTY

- A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Manufacturer's Special Warranty on Insulating Glass: Written warranty, made out to Owner and signed by insulating-glass manufacturer agreeing to furnish replacements for insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

Note: Provide safety glass in all areas where required by code.

2.1 PRODUCTS AND MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products indicated in schedules at the end of Part 3.
- B. Products: Subject to compliance with requirements, provide one of the products indicated in schedules at the end of Part 3.

2.2 PRIMARY FLOAT GLASS

- A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Quality q3 (glazing select); class as indicated in schedules at the end of Part 3.

2.3 HEAT-TREATED FLOAT GLASS

- A. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.
- B. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent glass, flat); Quality q3 (glazing select); class, kind, and condition as indicated in schedules at the end of Part 3.

2.4 WIRED GLASS

- A. Wired Glass: ASTM C 1036, Type II (patterned and wired glass, flat), Class 1 (clear), Quality q8 (glazing); 6.4 mm thick; of form and mesh pattern indicated below:
 - 1. Polished Wired Glass: Form 1 (wired, polished both sides), and as follows:
 - a. Mesh m1 (diamond).
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- C. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Polished Wired Glass:
 - a. Ashai Glass Co./Ama Glass Corp.
 - b. Central Glass Co., Ltd.
 - c. Nippon Sheet Glass Co., Ltd.
 - d. Pilkington Glass Ltd.

2.5 INSULATING GLASS

- A. Insulating-Glass Units: Preassembled units consisting of sealed lites of glass separated by a dehydrated interspace, and complying with ASTM E 774 for Class CBA units and with requirements specified in this Article and in the Insulating-Glass Schedule at the end of Part 3.
- B. Overall Unit Thickness and Thickness of Each Lite: Dimensions indicated in the Insulating-Glass Schedule are nominal and the overall thicknesses of units are measured perpendicularly from outer surfaces of glass lites at unit's edge.
- C. Sealing System: Dual seal, with primary and secondary sealants as follows:
 - 1. Manufacturer's standard sealants meeting requirements of LEED IEQ 4.1.
- D. Spacer Specifications: Manufacturer's standard spacer material and construction.

- E. Spacer Specifications: Manufacturer's standard spacer material and construction complying with the following requirements:

- 1. Corner Construction: Manufacturer's standard corner construction.

2.6 GLAZING GASKETS

- A. Lock-Strip Gaskets: Neoprene extrusions in size and shape indicated, fabricated into frames with molded corner units and zipper lock strips, complying with ASTM C 542, black.
- B. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:
 - 1. Neoprene, ASTM C 864.
 - 2. EPDM, ASTM C 864.
 - 3. Silicone, ASTM C 1115.
 - 4. Thermoplastic polyolefin rubber, ASTM C 1115.
 - 5. Any material indicated above.
- C. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned gaskets of material indicated below; complying with ASTM C 509, Type II, black; and of profile and hardness required to maintain watertight seal:
 - 1. Neoprene.
 - 2. EPDM.
 - 3. Silicone.
 - 4. Thermoplastic polyolefin rubber.
 - 5. Any material indicated above.

2.7 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Perimeter Insulation for Fire-Resistive Glazing: Identical to product used in test assembly to obtain fire-resistance rating.

2.8 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

- 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 written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.
- B. Grind smooth and polish exposed glass edges.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing glazing, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep system.
 - 3. Minimum required face or edge clearances.
 - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where the length plus width is larger than 50 inches (1270 mm) as follows:
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. It shall be the responsibility of the Contractor to provide tempered "Safety Glass" as required by Code.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until just before each glazing unit is installed.
- F. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

3.5 GASKET GLAZING (DRY)

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.

- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 PROTECTION AND CLEANING

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.
- E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

3.8 GLAZING SCHEDULE:

NOTE: All glazing thicknesses must be designed to resist wind loads for the project area. The following should be considered a minimum:

Location

Thickness

Interior

¼” Provide safety glass as required by code

Exterior Glazing

1” Cardinal LoE³ – 366.

END OF SECTION 08800

SECTION 09250 – EXTERIOR SHEATHING

PART 1 – GENERAL

1.1 DESCRIPTION:

- A. Work in this section includes, but is not limited to: exterior wall sheathing.

1. Related work specified elsewhere:

- a. Cold formed metal framing.
- b. Rough carpentry.
- c. Joint sealers.
- d. Light-gauge metal framing.
- e. Architectural wall panels.

1.2 SUBMITTALS:

- A. Product data: Submit manufacturer's descriptive literature indicating material composition, thickness, sizes and fire resistance.

1.3 QUALITY ASSURANCE:

- A. Fire-resistance ratings: Where applicable, provide materials and construction that are identical to those of assemblies whose fire-resistance ratings are indicated.

1.4 DELIVERY, STORAGE AND HANDLING:

- A. Delivery: Deliver materials to the job site in manufacturer's original packaging, containers and bundles with manufacturer's brand name and identification intact and legible.
- B. Storage and handling: Store and handle materials to protect against contact with damp and wet surfaces, exposure to weather, breakage and damage to edges. Provide air circulation under covering and around stacks of materials.

1.5 LIMITATIONS:

- A. For all installations, design details such as fasteners, sealants and control joints per system specifications must be properly installed. Openings and penetrations must be properly flashed and sealed.
- B. Do not use DensGlass Gold sheathing as a base for nailing or mechanical fastening. Fasteners should be flush to the face of the board, not countersunk.

PART 2 – PRODUCTS

2.1 SHEATHING BOARD:

- A. Acceptable Products:

1. Type I: ½" DensGlass Gold Exterior Sheathing or preapproved equals.

2. Type II: ½” DensDeck Roof Board wherever Membrane roofing shall be adhered to sheathing.
- B. Composition:
 1. Gypsum sheathing manufactured in accordance with ASTM C 1177 with glass mats both sides and long edges, water-resistant treated core.
- C. Fire resistance:
 1. ½” DensGlass Gold Exterior Sheathing: Flame spread 10, smoke developed 0, when tested in accordance with ASTM E 84.

2.2 AIR, WATER AND WEATHER BARRIER:

- A. **Apply Perm-A-Barrier VPS 30 to entire exterior side of sheathing.**

2.3 ACCESSORIES:

- A. Joint tape: 2” wide 10x10 glass mesh tape.
- B. Screws, metal framing:
 1. Bugle or wafer head, self-tapping, rust-resistant, fine thread for heavy-steel gauge.
 2. Bugle or wafer head, rust-resistant sharp point, fine thread for light-gauge metal framing or furring.

PART 3 – EXECUTION

3.1 PREPARTION:

- A. Examine subframing; verify that surface of framing and furring members to receive sheathing does not vary more than 1/8” from the placement of faces of adjacent members.

3.2 SHEATHING:

- A. Provide DensGlass Gold Exterior Sheathing where indicated on drawings. Install sheathing in accordance with manufacturer’s instructions and applicable instructions in GA-253 and ASTM C 1280.
- B. Install DensGlass Gold Exterior Sheathing with gold side out.
- C. Use maximum lengths possible to minimize number of joints.
- D. Attach DensGlass Gold Exterior Sheathing to metal framing with screws spaced 8” o.c. at perimeter where there are framing supports; and 8” o.c. along intermediate framing in field.
- E. Drive fasteners to bear tight against and flush with surface of sheathing. Do not counter sink.
- F. Locate fasteners minimum 3/8” from edges and ends of sheathing panels, tight against and flush with surface of sheathing.

END OF SECTION

SECTION 09255 - GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Gypsum board assemblies.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Section 5400 Cold Formed Metal Framing
 - 1. Section 06100 Rough Carpentry

1.3 DEFINITIONS

- A. Gypsum Board Construction Terminology: Refer to ASTM C 11 and GA-505 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

1.4 ASSEMBLY PERFORMANCE REQUIREMENTS

- A. Fire Resistance: Provide gypsum board assemblies with fire-resistance ratings indicated.

1.5 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of product specified.
- C. Proposed control joint layout.

1.6 QUALITY ASSURANCE

- A. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.
- B. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

- C. Fire-Test-Response Characteristics: Where fire-resistance-rated gypsum board assemblies are indicated, provide gypsum board assemblies that comply with the following requirements:
 - 1. Fire-Resistance Ratings: As indicated by GA File Numbers in GA-600 "Fire Resistance Design Manual" or design designations in UL "Fire Resistance Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 2. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.

1.8 PROJECT CONDITIONS

- A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.
- B. Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours before application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.
- C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Gypsum Board and Related Products:
 - a. Georgia-Pacific Corp.
 - b. National Gypsum Co.; Gold Bond Building Products Division.
 - c. United States Gypsum Co.

2.2 GYPSUM BOARD PRODUCTS

- A. General: Provide gypsum board of types indicated in maximum lengths available that will minimize end-to-end butt joints in each area indicated to receive gypsum board application.
 - 1. Widths: Provide gypsum board in widths of 48 inches (1219 mm).
- B. Gypsum Wallboard:
 - 1. Type: Interior - Fiberock Brand VHI Panels. Thickness: 5/8 inch (15.9 mm).
 - 2. Type: Type X where required for fire-resistance-rated assemblies.
 - 3. Type: Curved applications: 2 layers of 1/4".
 - 4. Exterior: See 09250 – Exterior Sheathing.
 - 5. Edges: Tapered and featured (rounded or beveled) for prefilling.
- C. Water-Resistant Gypsum Backing Board: ASTM C 630/C 630M and as follows:
 - 1. Type: Regular, unless otherwise indicated.

2.3 TRIM ACCESSORIES

- A. Accessories for Interior Installation: Cornerbead, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:
 - 1. Material: Formed metal complying with the following requirement:
 - a. Steel sheet zinc coated by hot-dip process or rolled zinc.
 - b. Steel sheet zinc coated by hot-dip or electrolytic process, or steel sheet coated with aluminum or rolled zinc.
 - 2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:
 - a. Cornerbead on outside corners.
 - b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim, unless otherwise indicated.
 - c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.
 - d. U-bead with face and back flanges; face flange formed to be left without application of joint compound. Use U-bead where indicated.
 - e. One-piece control joint formed with V-shaped slot and removable strip covering slot opening spaced no more than 20'-0" o.c. Provide layout for approval prior to installation.
- B. Accessory for Curved Edges: Cornerbead formed of metal, plastic, or metal combined with plastic, with either notched or flexible flanges that are bendable to curvature radius.
- C. Finished accessories – metal corner guards. Install at all exposed outside corners. Leg length 1". Min 6'-0" in height.

2.4 JOINT TREATMENT MATERIALS

- A. General: Provide joint treatment materials complying with ASTM C 475/C 475M and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
- B. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated.

- C. Setting-Type Joint Compounds for Gypsum Board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.
 - 1. Where setting-type joint compounds are indicated as a taping compound only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.
 - 2. For prefilling gypsum board joints, use formulation recommended by gypsum board manufacturer.
 - 3. For filling joints and treating fasteners of water-resistant gypsum backing board behind base for ceramic tile, use formulation recommended by gypsum board manufacturer.
 - 4. For topping compound, use sandable formulation.

2.5 MISCELLANEOUS MATERIALS

- A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate. Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- C. Steel drill screws complying with ASTM C 1002 for the following applications:
 - 1. Fastening gypsum board to wood members.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING GYPSUM BOARD, GENERAL

- A. Gypsum Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.
- B. Install sound-attenuation blankets, where indicated, prior to installing gypsum panels.
- C. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- D. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- E. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Avoid joints other than control joints at corners of framed openings where possible.

- F. Attach gypsum panels to framing provided at openings and cutouts.

3.3 GYPSUM BOARD APPLICATION METHODS

- A. Single-Layer Application: Install gypsum wallboard panels as follows:
 - 1. On ceilings, apply gypsum panels prior to wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
 - 2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated, and provide panel lengths that will minimize end joints.
- B. Wall Tile Substrates: For substrates indicated to receive thin-set ceramic tile and similar rigid applied wall finishes, comply with the following:
 - 1. Install water-resistant gypsum backing board panels at showers, tubs, and where indicated. Install with 1/4-inch (6.4-mm) open space where panels abut other construction or penetrations.
- C. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:
 - 1. Fasten to wood supports with adhesive and supplementary nails or screws.

3.4 INSTALLING TRIM ACCESSORIES

- A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.
- B. Install cornerbead at external corners.

3.5 FINISHING GYPSUM BOARD ASSEMBLIES

- A. General: Treat gypsum board joints, interior angles, flanges of cornerbead, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.
- B. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.
- C. Apply joint tape over gypsum board joints and to flanges of trim accessories as recommended by trim accessory manufacturer.
- D. Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.
 - 1. Level 1 for ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
 - 2. Level 2 where panels form substrates for tile.
 - 3. Level 3 for gypsum board where indicated. (Ceilings)
 - 4. Level 5 for gypsum board surfaces. (Walls)
- E. Use the following joint compound combination as applicable to the finish levels specified:
 - 1. Embedding and First Coat: Setting-type joint compound. Fill (Second) Coat: Setting-type joint compound. Finish (Third) Coat: Sandable, setting-type joint compound.

- F. Where Level 5 gypsum board finish is indicated, embed tape in joint compound and apply first, fill (second), and finish (third) coats of joint compound over joints, angles, fastener heads, and accessories; and apply a thin, uniform skim coat of joint compound over entire surface. For skim coat, use joint compound specified for third coat, or a product specially formulated for this purpose and acceptable to gypsum board manufacturer. Touch up and sand between coats and after last coat as needed to produce a surface free of visual defects, tool marks, and ridges and ready for decoration.
- G. Where Level 3 gypsum board finish is indicated, embed tape in joint compound and apply first and fill (second) coats of joint compound.
- H. Where Level 2 gypsum board finish is indicated, embed tape in joint compound and apply first coat of joint compound.
- I. Where Level 1 gypsum board finish is indicated, embed tape in joint compound.
- J. Finish water-resistant gypsum backing board forming base for ceramic tile to comply with ASTM C 840 and gypsum board manufacturer's directions for treatment of joints behind tile.
- K. Finish cementitious backer units to comply with unit manufacturer's directions.

3.6 FIELD QUALITY CONTROL

- A. Above-Ceiling Observation: Architect will conduct an above-ceiling observation prior to installation of gypsum board ceilings and report any deficiencies in the Work observed. Do not proceed with installation of gypsum board to ceiling support framing until deficiencies have been corrected.

3.7 CLEANING AND PROTECTION

- A. Promptly remove any residual joint compound from adjacent surfaces.
- B. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure gypsum board assemblies are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 09255

SECTION 09511 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes acoustical panel ceilings installed with exposed suspension systems.

1.2 SUBMITTALS

- A. Product data for each type of product specified.
- B. Samples: Submit samples of the following:
 - 1. 6 inch square samples of each acoustical panel type, pattern, and color.
 - 2. Set of 6 inch long samples of exposed suspension system members, including moldings, for each color and system type required.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has successfully completed acoustical ceilings similar in materials, design, and extent to those indicated for Project.
- B. Fire-Performance Characteristics: Provide acoustical ceilings that are identical to those tested for the following fire performance characteristics, according to ASTM test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify acoustical ceiling components with appropriate markings of applicable testing and inspecting organization.
 - 1. Surface Burning Characteristics: As follows, tested per ASTM E 84, and complying with ASTM E 1264 for Class A products.
 - a. Flame Spread: 25 or less.
 - b. Smoke Developed: 50 or less.
- C. Single-Source Responsibility for Ceiling Units: Obtain each type of acoustical ceiling unit from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- D. Single-Source Responsibility for Suspension System: Obtain each type of suspension system from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the Work.
- E. Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system components (if any), and partition system (if any). Do not install panels prior to the approval by the Owner and Architect of all of the work above the ceiling, including, but not limited to Mechanical, Electrical, Plumbing, and Structural. All four corners of grid at all locations of ceiling mounted projectors shall be supported.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaging units in any way.

1.5 PROJECT CONDITIONS

- A. Space Enclosure: Do not install interior acoustical ceilings until space is enclosed, conditioned, and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity will be continuously maintained at values indicated for final occupancy.

PART 2 - PRODUCTS

2.1 ACOUSTICAL CEILING UNITS, GENERAL

- A. Standard for Acoustical Ceiling Units: Provide manufacturer's standard units of configuration indicated that comply with ASTM E 1264 classifications as designated by reference to types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.
- B. Colors and Patterns: Provide products to match appearance characteristics indicated under each product type.

2.2 MINERAL-BASE PANELS - WATER FELTED

- A. Type, Form, and Finish: Provide Type III, Form 2 units per ASTM E 1264 with painted finish that comply with pattern and other requirements indicated.
- B. Perforated and Fissured Pattern: Units matching pattern indicated by reference to manufacturer standard pattern designations, with other characteristics as follows:
 - 1. Color/Light Reflectance Coefficient: White/LR 0.80.
 - 2. Noise Reduction Coefficient: NRC 0.55.
 - 3. Ceiling Sound Transmission Class: CSTC 35.
 - 4. Edge Detail: Square.
 - 5. Size: 24 inches by 24 inches by 5/8-inch.
- C. Products: Subject to compliance with requirements, provide one of the following, or approved substitute. Basis of design: #756A Armstrong.
 - 1. "Hytone Baroque", Celotex Corp.
 - 2. "Radar", USG Interiors, Inc.
 - 3. "Baroque", Certain Teed Corporation

2.3 CEILINGS OF VINYL FACED GYPSUM PANELS

- A. Panel Characteristics: Type III units per ASTM E 1264 impact and soil resistant and complying with pattern and other requirements indicated.
 - 1. Approval: USDA approved for food service areas
 - 2. Pattern: Embossed stipple
 - 3. Color/Light Reflectance Coefficient: White/LR-1

4. Noise Reduction Coefficient: NA
5. Ceiling Sound Transmission Class: CAC 40-50
6. Edge Detail: Square
7. Thickness: ½ inch
8. Size: 24 by 24 inches (610 by 610 mm)

B. Suspension System Type: As described below and specified in Part 2 “Non-Fire-Resistance-Rated, Direct-Hung Suspension Systems” Article:

1. Wide-faced, aluminum-capped, double-web, hot-dip galvanized-steel suspension system.
2. Coordinate suspension system with other trades. No wire supports shall pass through the building’s cable tray system.

2.4 METAL SUSPENSION SYSTEMS, GENERAL

- A. Standard for Metal Suspension Systems: Provide manufacturer's standard metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C 635 requirements.
- B. Finishes and Colors: Provide manufacturer's standard factory-applied finish for type of system indicated.
- C. Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated.
- D. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.
 1. Gage: Provide wire sized so that stress at 3 times hanger design load (ASTM C 635, Table 1, Direct-Hung), will be less than yield stress of wire, but provide not less than 0.106-inch diameter (12 gage).
- E. Edge Moldings and Trim: Manufacturer's standard molding for edges and penetrations of ceiling which fits with type of edge detail and suspension system indicated.

2.5 NON-FIRE-RESISTANCE-RATED DIRECT-HUNG SUSPENSION SYSTEMS

- A. Wide-Face Capped Double-Web Steel Suspension System: Main and cross-runners roll-formed from prepainted or electrolytic zinc-coated cold-rolled steel sheet, with prefinished 15/16-inch-wide metal caps on flanges; other characteristics as follows:
 1. Structural Classification: Intermediate-Duty System.
 2. End Condition of Cross-Runners: Override (stepped) or butt-edge type, as standard with manufacturer.
 3. Cap Material and Finish: Steel sheet painted white.
- B. Manufacturer: Subject to compliance with requirements, provide products of one of the following, or approved substitute:
 1. Armstrong World Industries, Inc.
 2. Chicago Metallic Corporation.
 3. National Rolling Mills, Inc.
 4. USG Interiors, Inc.

2.6 MISCELLANEOUS MATERIALS

- A. Concealed Acoustical Sealant: Manufacturers standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of

airborne sound.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and structural framing to which ceiling system attached or abuts for compliance with requirements specified in this and other sections that affect installation and anchorage of ceiling system. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half-width units at borders, and comply with reflected ceiling plans.

3.3 INSTALLATION

- A. General: Install acoustical ceiling systems to comply with installation standard referenced below, per manufacturer's instructions and CISCA "Ceiling Systems Handbook".

- 1. Standard for Installation of Ceiling Suspension Systems: Comply with ASTM C 636.

- B. Arrange acoustical units and orient directionally patterned units in manner shown by reflected ceiling plans.

- C. Suspend ceiling hangers from building structural members and as follows:

- 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.

- 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

- 3. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

- 4. Do not attach hangers to steel roof deck. Attach hangers to structural members.

- 5. Space hangers not more than 4'-0" o.c. along each member supported directly from hangers, unless otherwise shown, and provide hangers not more than 8 inches from ends of each member.

- D. Install edge moldings of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical units.

- 1. Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.

- 2. Screw-attach moldings to substrate at intervals not over 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to tolerance of 1/8 inch in 12'-0". Miter corners accurately and connect securely.

- E. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations.

3.4 CLEANING

- A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09511

SECTION 09651 - LUXURY VINYL FLOOR TILE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Luxury vinyl floor tile. LVT

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.

1. Show details of special patterns.

C. Samples: Full-size units of each color and pattern of floor tile required.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 LUXURY VINYL FLOOR TILE

Specified Product: Min. wear layer 0.020 in.

1. Shaw Contract: Shaw LVT with ExoGuard +
 - a) Terrain II – selected from full line
 - b) Inspire LVT – selected from full line
2. Armstrong: Natural Creations with Dimond 10 technology.
 - a) ArborArt – selected from full line
 - b) EarthCuts – selected from full line

3. J+J Flooring:
 - a) Classics 3mm V5000 – selected from full line
 - b) Make Your Mark 3mm V5013 – selected from full line
 - c) Power Play 3mm V5019 – selected from full line
 - d) Timeless 3mm V5011 – selected from full line

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
 3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing.
 4. Moisture Testing: Proceed with installation only after substrates pass testing according to floor tile manufacturer's written recommendations, but not less stringent than the following:
 - a) Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate recommended by manufacturer in writing.
 - b) Proceed with installation only after substrates have met manufacturer's written requirements.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound approved by manufacturer; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install floor tiles until they are the same temperature as the space where they are to be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.2 FLOOR TILE INSTALLATION

- A. Comply with manufacturer's written instructions for installing floor tile.

- B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.
 - 1. Lay tiles in pattern determined by architect.
- C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
- D. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures. Extend beneath built-in furniture, cabinets, pipes, outlets, and door frames.
- E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- H. Adhere floor tiles to flooring substrates using a full spread of manufacturer's recommended adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.3 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Cover floor tile until Substantial Completion.

END OF SECTION 09651

SECTION 09653 - RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Resilient base.
 - 2. Resilient stair accessories.

1.3 SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Initial Selection: For each type of product indicated.

1.4 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

1.6 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than **70 deg F (21 deg C)** or more than **95 deg F (35 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.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 THERMOPLASTIC-RUBBER BASE

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Allstate Rubber Corp.
 - 2. Armstrong World Industries, Inc.
 - 3. Johnsonite; A Tarkett Company.
 - 4. Mondo Rubber International, Inc.
 - 5. Roppe Corporation, USA.
- B. Product Standard: ASTM F 1861, Type TS rubber.
 - 1. Group: I - solid, homogeneous
 - 2. Style and Location:
 - a. Style, Cove (base with toe)
- C. Thickness: 0.125 inch
- D. Height: 4 inches. Match base height at locker bases.
- E. Lengths: Coils in manufacturer's standard length. Do not break continuous lengths of base run in spaces to receive cove base. Each span of wall shall receive one, unbroken length. No "piecing" is accepted.
- F. Outside Corners: Preformed
- G. Inside Corners: Job formed
- H. Colors: As selected by Architect from full range of industry colors.

2.2 RUBBER STAIR ACCESSORIES

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- B. Manufacturers: All resilient base accessories shall be by one manufacturer.
- C. Stair Treads: ASTM F 2169.
 - 1. Type: TS rubber
 - 2. Class: 2 pattern; raised disk.
 - 3. Nosing Style: Square, adjustable to cover angles between 60 and 90 degrees
 - 4. Nosing Height: 1-1/2 inches
 - 5. Thickness: 1/4 inch
 - 6. Size: Lengths and depths to fit each stair tread in one piece.
- D. Separate Risers: Smooth, flat; in height that fully covers substrate; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.

1. Style: Smooth ,flat, toeless. Riser height varies, match existing.
2. Thickness: 0.125 inch

- E. Landing Tile: Matching treads; produced by same manufacturer as treads.
- F. Locations: At all intermediate landings and as shown.
- G. Colors and Patterns: As selected by Architect from full range of industry colors.

2.3 RUBBER MOLDING ACCESSORY

- A. Manufacturers: All resilient base accessories shall be by one manufacturer.
- B. Profile and Dimensions: To be selected from manufactures full line.
- C. Locations: At each transition between dissimilar flooring materials and at platform nosing.
- D. Colors and Patterns: As selected by Architect from full range of industry colors.

2.4 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Stair-Tread Nose Filler: Two-part epoxy compound recommended by resilient stair-tread manufacturer to fill nosing substrates that do not conform to tread contours.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. 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.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Concrete Substrates for Resilient Stair Accessories: Prepare horizontal surfaces according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
 3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10pH.
 4. Moisture Testing: Proceed with installation only after substrates pass testing according to manufacturer's written recommendations, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft in 24 hours.
 - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install resilient products until they are the same temperature as the space where they are to be installed.
1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.
- H. Job-Formed Corners:
 1. Inside Corners: Use straight pieces of maximum lengths possible.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Stair Accessories:
 - 1. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.
 - 2. Tightly adhere to substrates throughout length of each piece.
- C. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum horizontal surfaces thoroughly.
 - 3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION 09653

SECTION 09656 - Resilient Athletic Flooring

PART 1-GENERAL DESCRIPTION

1.01 DESCRIPTION

- A. Scope
 - 1. The complete installation of rolled rubber flooring product. Basis of design: Robbins, Inc. including adhesive and rolled rubber product.
- B. Related Work Specified Under Other Sections: (A cross reference should be incorporated in these sections.)
 - 1. Substrate Buildup:
 - i. Concrete for indoor installation..... Section 03300
 - 2. Slab Tolerance
 - i. Slab tolerance is (+/-) 1/8" in radius of 10'. Surface steel troweled.
 - ii. **NO CURING AGENTS OR SEALERS ARE TO BE APPLIED TO THE CONCRETE SLAB.**
 - 3. Membrane Waterproofing and Dampproofing.....
 - i. Concrete subfloors on or below grade shall be adequately waterproofed beneath and at the perimeter of the slab and on the earth side of below-grade walls.
 - 4. Thresholds-Metal

1.02 QUALITY ASSURANCE

- A. Floor System Manufacturer Qualifications
 - 1. Manufacturer shall be an established firm experienced in field and have been in business for a minimum of ten (10) years; Robbins, Inc., or an approved equal.
- B. Floor Contractor/Installer Qualifications
 - 1. Flooring contractor shall be experienced in the flooring field and approved by manufacturer.
 - 2. Flooring contractor shall be factory-approved and have completed at least three projects of similar magnitude and complexity.

1.03 SUBMITTALS

- A. Manufacturer's Product Data
- B. Samples: Provide samples of all available colors
- C. Maintenance Literature: Submit maintenance instructions.

1.04 ELIVERY, STORAGE

- A. Delivery of Materials
 - 1. Material shall not be delivered or installed until all masonry, painting, plastering, tile work, marble and terrazzo work are completed, and all overhead mechanical work, lighting, backstops, scoreboards are installed. Room temperature of at least 55 degrees Fahrenheit and moisture content of concrete slab of 3% or less.
 - 2. Area where materials are to be stored should be maintained at 55 degrees Fahrenheit and under 50% relative humidity by the General Contractor.

1.05 JOB CONDITIONS

A. Schedule of Installation

1. Do not install floor system until concrete has been cured sixty (60) days, and the conditions in Paragraphs 1.01 and 1.04 are obtained.
2. Environmental temperatures must average a minimum of 65 degrees Fahrenheit for one full week preceding, throughout, and 72 hours following application.
3. Do not install Galaxy Classic Sport Surface until all other trades are completed.
4. After Galaxy Classic Sport Surface is installed, area is to be locked by general contractor to allow curing time for the paint and adhesive. No other trades are to be allowed on floor until it is accepted in writing by owner or authorized agent.

1.05 GUARANTEE

- A. Material to be free from manufacturing defects for a period of Five (5) years.

PART 2-PRODUCTS

2.01 MATERIALS

A. Galaxy Classic Sport Surface

1. Surface shall be rubber roll goods 3/8 inch thick, 4 feet wide, and 40 feet long. Material shall be comprised of rubber granules from recycled automobile tires , and colored EPDM rubber granules , encapsulated in a zero-mercury polyurethane binder. Laminated products will not be approved.
2. Typical physical properties of **Galaxy Classic**
 - Density PCF ASTM D3676 60
 - Shore A Hardness D2240 60 +/-5
 - Compression & Recovery (%) C 5-15
F36 (100 PSI 5-15) R85
 - Static Load Limit (PSI) 970-93 >4,000
 - Flexibility F137 ¼' Mandrel PASS
 - Co-efficient of Friction 1.20
D2047-82 (Wet and Dry Avg)
 - Tear Strength ASTM D624 80 pli min
 - Elongation ASTM D412 >145%
 - Tensile Strength >220 PSI
 - Compression Set B 60
D395 (25% Defl., 158°F/22Hrs)
 - Compression Endurance NO DETERIORATION
D623 (10,000 Cycles
With 4-10 Ton Load)
 - Abrasion Resistance C501 0.18
(Weight loss in GMS/KC)
H18 Wheel, 500 GM Load
 - Freeze Thaw NO CHANGE
(-40°C, 40° Cycles)
 - Thermal Stability -40°C to +90°C
 - Accelerated Weathering (2500) NO CHANGE
 - NY Fire Gas Toxicity YES
#09300 900 216 4006

B. Adhesive

- Manufacturer's approved adhesives. No substitutions. Use of any non-approved adhesive shall void warranty.

PART 3-EXECUTION

3.02 INSTALLATION

A. Rubber flooring.

1. Product should be unrolled and allowed to relax before cutting and fitting, 12 to 24 hours.
2. Mix two-component polyurethane adhesive according to manufacturer's instructions.
3. Unroll product into freshly applied adhesive. End seams should be overlapped and double cut. Edge seams should be factory edge. Overlap seams 1/8" and compression fit.
4. Roll the entire sport floor surface with a medium-size steel roller to remove entrapped air. Wipe away adhesive that oozes between seams with wood alcohol.

- B. Clean up all unused materials and debris and remove same from the premises. Dispose of empty containers in accordance with federal and local statutes.

SECTION 09705 - EPOXY FLOORING

PART I - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Definitions: Epoxy flooring includes penetrating two-component epoxy primer, free flowing epoxy formulation including resin, hardener and reactive flow enhancers, brightly colored, quartz silica aggregate broadcast and a two-component, high performance, clear epoxy sealer.
- B. Related Work
 - 1. Division 3 Section Cast-in-place Concrete
 - 2. Division 7 Section Fluid Applied Waterproofing
 - 3. Division 7 Section Joint Sealers

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data, installation instructions, and general recommendations for each epoxy flooring material required. Include certification indicating compliance of materials with requirements.
- B. Samples: Submit, for verification purposes, 4-inch square samples of each type of epoxy flooring required, applied to a rigid backing, in color and finish indicated.
 - 1. For initial selection of colors and finishes, submit manufacturer's color charts showing full range of colors and finishes available.
- C. Installer Certificates:
 - 1. Certificates signed by manufacturer certifying that installers comply with specified requirements.
- D. Material Test Reports:
 - 1. From a qualified independent testing agency indicating and interpreting test results of the flooring's reaction to chemicals and other reagents and substantiating compliance with requirements.
- E. Maintenance Data:
 - 1. Supply maintenance data for epoxy flooring to include in the maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
 - 1. Obtain primary floor topping materials, including primers, resins, hardening agents, specially blended aggregates and finish coats, from a single manufacturer with a

minimum of seven (7) years of experience providing materials of the type specified in this Section.

A. Installer's Qualifications:

1. Engage an Installer who has successfully completed, within the last three years, at least five (5) epoxy flooring applications similar in size and of the same system(s) as specified in this Section, and who will assign mechanics from these earlier applications to this Project, one of which will serve as lead mechanic.
2. Installer must be approved, in writing, by the manufacturer of the epoxy topping system.
3. Engage an installer who employs workers for this Project who are trained and certified by the manufacturer for installation techniques required.

A. Pre-Installation Conference:

1. Prior to the installation of the epoxy floor topping include the following in a pre-installation conference:
 - a. Installer.
 - b. Epoxy flooring manufacturer's representative.
 - c. Installers of related work and other entities concerned with the performance of the epoxy floor topping.
 - d. Insurer (where applicable).
 - e. Testing agencies (where applicable).
 - f. Government authorities (where applicable).
 - g. Architect/Engineer (where applicable).
 - h. Owner (where applicable),
1. Record discussions and agreements and furnish a copy to each participant.
2. Provide at least one week advance notice to participants prior to Pre-Installation Conference.

A. Floor Thickness Verification:

1. At the Owner's direction and under his supervision the applicator shall take 2 random cores per 1,000 square feet through the system to the substrate, prior to applying the seal coat, to verify proper floor thickness.
2. The applicator shall repair these areas to match the surrounding surface prior to applying the final seal coat. Any area less than specified thickness shall be removed and replaced by the applicator, in a manner that does not affect the aesthetics or integrity of the overall floor.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Material shall be delivered to job site and checked by flooring contractor for completeness and shipping damage prior to job start.
- B. All materials used shall be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighing or volumetric measurements allowed.
- C. Material shall be stored in a dry, enclosed area protected from exposure to moisture. Temperature of storage area shall be maintained between 60 and 85°F/16 and 30°C.

1.6 PROJECT CONDITIONS

- A. Concrete substrate shall be properly cured for a minimum of 30 days. A vapor barrier must be present for concrete subfloors on or below grade. Otherwise, an osmotic pressure resistant grout must be installed prior to the epoxy flooring.
- B. Utilities, including electric, water, heat (air temperature between 60 and 85°F/16 and 30°C) and finished lighting to be supplied by General Contractor.
- C. Job area to be free of other trades during, and for a period of 24 hours, after floor installation.
- D. Protection of finished floor from damage by subsequent trades shall be the responsibility of the General Contractor.

1.7 WARRANTY

- A. Manufacturer shall furnish a single, written warranty covering both material and workmanship for a period of one (1) full year from date of installation.

PART II - PRODUCTS

2.1 COLORS

- A. Colors: As selected by Architect from manufacturer's standard colors.

2.2 EPOXY FLOORING

- A. Stonshield SLT (2 mm) as manufactured by Stonhard, Inc. is a nominal 1/8"/3mm thick system comprised of a penetrating, two-component epoxy primer, three-component, free flowing epoxy formulation including resin, hardener and reactive flow enhancers, brightly colored, quartz silica aggregate broadcast and a two-component, high performance, clear epoxy sealer. A 6" standard cove base is included in the scope of work.

Products from the following manufacturers meeting the requirements of this specification will also be accepted.

- 1. General Polymers – Ceramic Carpet #400/425
- 2. Dex-O-Tex – Décor-Flor Flooring
- 3. Key Resin

- 1. Physical Properties: Provide flooring system in which physical properties of topping including aggregate, when tested in accordance with standards or procedures referenced below, are as follows:

Compressive Strength	9,000 psi
(ASTM C-579)	
Tensile Strength.....	1,600 psi
(ASTM D-638)	
Flexural Strength.....	4,000 psi
(ASTM C-580)	
Hardness	85-90
(ASTM D-2240/Shore D Durometer)	
Bond Strength	>400 psi
(ASTM D-4541)	(100% concrete failure)
Impact Resistance	>160 in. lbs.
(ASTM D-4226)	

Abrasion Resistance.....	0.06 gm max. weight loss
(ASTM D-4060, Taber Abrader CS-17 wheel)	
Flexural Modulus of Elasticity	1.0 x 10 ⁶ psi
(ASTM C-580)	
Flammability	Self Extinguishing.
(ASTM D-635)	Extent of burning 0.25 inches max.
Thermal Coefficient of Linear Expansion	1.8 x 10 ⁻⁵ in/in°C
(ASTM C-531)	
Coefficient of Friction	0.7 - 0.8
(ASTM D-2047)	
Water Absorption	0.1%
(ASTM C-413)	
Heat Resistance Limitation.....	140°F/60°C
	(for continuous exposure)
	200°F/93°C
	(for intermittent spills)
Cure Rate allow:.....	8 hours for foot traffic
(at 77°F/25°C)	18 hours for light traffic
	24 hours for normal operations

2.3 JOINT SEALANT MATERIALS

- A. Type produced by manufacturer of epoxy flooring system for type of service and joint condition indicated.

PART III - EXECUTION

3.1 PREPARATION

- A. Provide sound surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with flooring. Fill in all voids where demolition has damaged existing surfaces with concrete.
- B. Comply with ASTM C 811 requirements, unless manufacturer's written instructions are more stringent.
- C. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup or grind with terrazzo grinding machine.
- D. The prepared concrete shall have a surface profile equal to 40- 60 grit sandpaper.
- E. Repair damaged and deteriorated concrete according to epoxy flooring manufacturer's written recommendations.
- F. Cracks and non-expansion joints of 3/32' or wider and depth of 3/8" shall be routed. Install crack filler as recommended by manufacturer. All cracks are then to be taped with a 4" wide RP fabric embedded in waterproof membrane liquid.
- G. All flooring termination points shall require saw cutting the substrate 1/4" and chiseling a 2" wide chase along the straight saw-cut to provide a smooth transition from finished surface to termination surface. No feather edging shall be acceptable.
- H. New flooring shall be flush with all floor drain flanges. Remove existing concrete as required to produce this condition.

3.2 APPLICATION

- A. Prime surface with liberal brush coat of manufacturer recommended epoxy primer. Primer coat must be wet to accept system.

- B. Apply epoxy adhesion coat and trowel or squeegee and cross roll. Allow to self- level. Broadcast quartz granules into wet adhesion coat and continue broadcasting to excess until the floor appears completely dry.
- C. All imperfections such as high spots should be smoothed before the application of the second broadcast.
- D. After overnight cure, vacuum up excess aggregate. Give floor a light scraping with the edge of the trowel to remove rough spots. Vacuum, removing all loose particles.
- E. Apply clear grout coat making sure of uniform coverage. Two coats may be required. Allow to cure.
- F. Apply clear finish seal coat making sure of uniform coverage. Allow to cure minimum of 24 hours before opening to traffic.
- G. Finish shall be in color and skid resistant profile as approved by Architect and shall match approved sample.
- H. Integral 5" Cove Base: apply cove base mix to wall surfaces at all locations where epoxy flooring is installed. Round internal and external corners. Install cove base according to manufacturer's written instructions and details including taping, mixing, priming, troweling, sanding, and top coating of cove base.

3.3 FIELD QUALITY CONTROL

- A. The right is reserved to invoke the following material testing procedure at any time, and any number of times during period of flooring application.
- B. The Owner will engage service of an independent testing laboratory to sample materials being used on the job site. Samples of material will be taken, identified and sealed, and certified in presence of Contractor.
- C. Testing laboratory will perform tests for any of characteristics specified, using applicable testing procedures referenced herein, or if none referenced, in manufacturer's product data.
- D. If test results show materials being used do not comply with specified requirements, Contractor may be directed by Owner to stop work; remove non-complying materials; pay for testing; reapply flooring materials to properly prepared surfaces which had previously been coated with unacceptable materials.

3.4 CURING, PROTECTION AND CLEANING

- A. Cure epoxy flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.
- B. Protect epoxy flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.
- C. Cleaning: Remove temporary covering and clean epoxy flooring just prior to final inspection. Use cleaning materials and procedures recommended by epoxy flooring manufacturer.

END OF SECTION 09705

SECTION 09900 - PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.
 - 1. Surface preparation, priming, and finish coats specified in this section are in addition to shop priming and surface treatment specified under other sections.
- B. Paint exposed surfaces whether or not designated in "schedules", except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.
 - 1. Painting includes field painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.
- C. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces except as indicated, operating parts, and labels.
 - 1. Concealed Gypsum Drywall: Provide scheduled moisture retarding primer finish at all concealed gypsum drywall located above acoustical panel ceilings.
 - 2. Labels: Do not paint over UL, FM, or other code required labels or equipment name, identification, performance rating, or nomenclature plates.
- D. Related Sections: The following sections contain requirements that relate to this Section:
 - 1. Division 5 Section "Metal Fabrications" for shop priming ferrous metal.
 - 2. Division 8 Section "Steel Doors and Frames" for shop priming steel doors and frames.

1.2 DEFINITIONS

- A. "Paint" includes coating systems materials, primers, emulsions, enamels, stains, sealers, and fillers, and other applied materials whether used as prime, intermediate, or finish coats.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's technical information, label analysis, and application instructions for each material proposed for use.
 - 1. List each material and cross-reference the specific coating and finish system and application. Identify each material by the manufacturer's catalog number and general classification.
- B. Samples for initial color selection in the form of manufacturer's color charts.
 - 1. After color selection, the Architect will furnish color chips for surfaces to be coated.

- C. Samples for Verification Purposes: Provide samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate. Define each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.
1. Provide a list of material and application for each coat of each sample. Label each sample as to location and application.
 2. Submit samples on the following substrates for the Architect's review of color and texture only:
 - a. Concrete Masonry: Provide two 4 - by 8 - inch samples of masonry, with mortar joint in the center, for each finish and color.
 - b. Gypsum Board: Provide two 12 - by 12 - inch samples of each finish and color on gypsum board.
 - c. Ferrous Metal: Provide two 4 - by 8 - inch samples of flat metal for each finish and color.

1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.
- B. Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
1. Notify the Architect of problems anticipated using the materials specified.
- C. Material Quality: Provide the manufacturer's best quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
1. Proprietary names used to designate colors or materials are not intended to imply that products names are required or to exclude equal products of other manufacturers.
- D. Field Constructed Mock-Ups: Apply primer and each coat of paint to one typical classroom. Classroom shall be reviewed and approved by the Owner and Architect prior to the application to any other paint. The mock-up classroom shall serve as the standard for all CMU paint application throughout the building.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
1. Product name or title of material.
 2. Product description (generic classification or binder type).
 3. Federal Specification number, if applicable.
 4. Manufacturer's stock number and date of manufacture.
 5. Contents by volume, for pigment and vehicle constituents.
 6. Thinning instructions.
 7. Application instructions.
 8. Color name and number.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg.F (7 deg.C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 JOB CONDITIONS

- A. The building must be completely enclosed and dried-in. Perform moisture test on masonry walls prior to application of paint. Moisture levels must meet manufacturers requirements.
 - B. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg.F (10 deg.C) and 90 deg.F (32 deg.C).
 - C. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are between 45 deg.F (7 deg.C) and 95 deg.F (35 deg.C).
 - D. Do not apply paint in snow, rain, fog, or mist, when relative humidity exceeds 85 percent, at temperatures less than 5 deg.F (3 deg.C) above the dew point, or to damp or wet surfaces.
1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

PART 2 – PRODUCTS

NOTE: SEE PAINT SCHEDULES AT THE END OF THIS SECTION.

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products of one of the following, or approved substitute:
 1. PPG Paints (PPG)
 2. Glidden Professional (Glidden)
 3. The Sherwin-Williams Company (S-W).

2.2 MASONRY BLOCK FILLER

- A. Block Filler: Block fillers used for filling open textured interior and exterior concrete masonry block before application of top coats:
 1. S-W: LX01W0200 White

2.3 PRIMERS:

- A. Exterior Acrylic Primer : Exterior acrylic wood primer used for priming wood or gypsum board under a flat acrylic emulsion finish:
 1. PPG: 17-921 Seal Grip Interior Exterior Universal Acrylic Primer.
 2. Glidden: 6001 HYDROSEALER Primer Sealer
 3. S-W: B42W41 A-100 Exterior Latex Primer.
- B. 100% Acrylic Interior Primer: 100% Acrylic primer-sealer for interior gypsum drywall:

1. PPG: 17-921 Seal Grip Interior Exterior Universal Acrylic Primer.
 2. Glidden: 1010 High-Hide Interior Primer Sealer.
 3. S-W: Prep-Rite Classic Primer B-28.
- C. Synthetic, Rust-Inhibiting Primer: Quick-drying, rust-inhibiting primer for priming interior and exterior ferrous metal surfaces:
1. PPG: 6-208 Speedhide Rust Inhibitive Metal Primer.
 2. Glidden: 4160 Devguard Multi Purpose Primer
 3. S-W: Kem Kromik Metal Primer B50N2/B50W1.
- D. Galvanized Metal Primer: Primer used to prime interior and exterior zinc-coated (galvanized) metal surfaces:
1. PPG: PPG 90-712 Pitt Tech DTM Acrylic Metal Primer.
 2. Glidden: 4020PF Devflex DTM Primer Finish.
 3. S-W: Galvite B50W3.
- E. Epoxy Metal Primer: Primer used to prime ferrous metal handrails:
1. PPG: Amerlock 2 VOC High Build Epoxy..
 2. Glidden: PPG 95-245 Pitt Guard DTR Rapid Coat Epoxy Mastic Primer.
 3. S-W: Equal Product.

2.4 EXTERIOR FINISH PAINT MATERIAL

- A. Waterproofing Masonry Coating: for use on the exterior over concrete, stucco, EIFS, masonry (including masonry block and brick):
1. PPG: Prior approved equal
 2. Glidden: Prior approved equal
 3. S-W: LX11-50 Series.
- B. DTM Water Borne Acrylic Semi Gloss Enamel: DTM Semi Gloss Acrylic paint for use over prime-coated ferrous or galvanized metal:
1. PPG: 4216HP DTM High Performance Waterborne Acrylic Semi Gloss.
 2. Glidden: 4216HP DTM High Performance Waterborne Acrylic Semi Gloss..
 3. S-W: DTM Acrylic Semi-Gloss, B66W211.
- C. Gloss Urethane Enamel: Urethane finish for ferrous metal handrails:
1. PPG: 95-812 Pitthane Ultra Gloss Urethane Enamel.
 2. Glidden: PPG 95-812 Pitthane Ultra Gloss Urethane Enamel.
 3. S-W: Equal Product.

2.5 INTERIOR FINISH PAINT MATERIAL

- A. Latex-Based Interior Flat Paint: Ready-mixed, latex-based paint for use as a flat finish over concrete and masonry surfaces, including filled concrete masonry block, mineral-fiber-reinforced cement panels, and plaster and over prime-coated gypsum drywall, ferrous metal, and zinc-coated (galvanized) metal surfaces:
1. PPG: 6-70 Speedhide Latex Flat Wall Paint
 2. Glidden: 1210 Ultra Hide Latex Flat Wall Paint
 3. S-W: Pro-mar 200 Latex Flat Wall Paint B30W201.

- B. Latex-Based Interior Semi-Gloss Paint: Ready-mixed, latex-based paint for use as a finish over prime-coated gypsum drywall, concrete block, ferrous metal, and zinc-coated (galvanized) metal surfaces.
1. PPG: 6-500 Speedhide Interior Semi-Gloss Latex.
 2. Glidden: 1416 Ultra Hide Latex Semi Gloss Enamel.
 3. S-W: Pro-mar 200 Latex Semi-Gloss Enamel B31W201.
- C. Pre Catalyzed Semi Gloss Acrylic Epoxy: Paint system for use over concrete masonry block, with manufacturer's recommended primer:
1. PPG: 16-510 Pitt-Glaze WB1 Semi-Gloss Pre-Catalyzed WB Acrylic Epoxy.
 2. Glidden: 16-510 Pitt-Glaze WB1 Semi-Gloss Pre-Catalyzed WB Acrylic Epoxy..
 3. S-W: Pro Industrial PreCatalyzed Epoxy Semi Gloss, K45W151 Series.
- D. Alkyd Gloss Enamel for use over a primer and undercoat on interior plaster surfaces, wood, and hardboard and ferrous and zinc-coated metal surfaces:
1. PPG: 7-282 Industrial Oil Base Gloss Enamel.
 2. Glidden: 4308 Devguard Alkyd Gloss Enamel.
 3. S-W: Industrial Enamel B-54 Series.
- E. Concrete floor sealing for use in spaces indicated as "PC" floors in the Schedule of Finishes. Provide floor prep and primer as directed by manufacturer.
1. PPG: 4-4210XI Perma Crete Color Seal WB Interior/Exterior Concrete Stain .

2.6 MISCELLANEOUS WOOD FINISHING MATERIALS

- A. Satin Polyurethane: Clear polyurethane with satin finish for use over wood surfaces.
1. PPG: DFT259 Deft Interior/Exterior Polyurethane Water Based Satin Varnish.
 2. Glidden: 1902 Woodpride Satin Polyurethane Varnish.
 3. S-W: Wood Classics Satin Polyurethane A67F1.
- B. Gloss Polyurethane: Clear Gloss Polyurethane thinned per manufacturer's recommendations as a sealer under satin finish coat.
1. PPG: DFT61 Deft Sanding Sealer Interior Water Based
 2. Glidden: 1908 Woodpride Gloss Polyurethane Varnish. (Thin per mfg. recommendations)
 3. S-W: Wood Classics Gloss Polyurethane A67V1. (Thin per mfg. recommendations)
- C. Oil-Type Interior Wood Stain: Slow-penetrating oil-type wood stain for general use on interior wood surfaces under varnishes or wax finishes:
1. PPG: DFT400 Deft Interior Oil Based Wood Stain.
 2. Glidden: 1700 Woodpride Oil Stain.
 3. S-W: Oil Stain A-48 Series.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which painting will be performed for compliance with requirements for application of paint. Do not begin paint application until unsatisfactory conditions have been corrected.
 - 1. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

3.2 PREPARATION

- A. General Procedures: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items in place that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items if necessary for complete painting of the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.
 - 1. Clean surfaces before applying paint or surface treatments. Remove oil and grease prior to cleaning. Schedule cleaning and painting so that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- B. Surface Preparation: Clean and prepare surfaces to be painted in accordance with the manufacturer's instructions for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing of problems anticipated with using the specified finish-coat material with substrates primed by others.
 - 2. Concrete (Bare) – Interior – Concrete Stain (PC)
 - a. Surface Preparation: All concrete surfaces must be sound, clean, dry, cured, and profiled. All concrete surfaces shall be free of surface hardeners, form release agents, curing compounds, laitance, efflorescence, chloride contamination, hydrostatic water pressure or excessive capillary water action, and/or water vapor emission. All concrete surfaces shall be cleaned first with a strong detergent to remove oils, grease, dirt and any other contamination before proceeding with acid etching to achieve a porous and coatable surface.
- C. Cementitious Materials: Prepare concrete, concrete masonry block, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation. All block surfaces shall be patched, cleaned, touched up prior to application of Blockfill.
 - 1. Use abrasive blast-cleaning methods if recommended by the paint manufacturer.
 - 3. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
 - 4. New paint over existing painted concrete block surfaces: Clean the surface thoroughly, remove all contamination. Sand to dull the surface. Thoroughly clean prior to application of primer and paint.
 - 5. Metal roof deck – Remove by mechanical means all existing paint material, thoroughly clean prior to application of new primer and paint.
- D. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - 1. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer before application of primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.

- E. Ferrous Metals: Clean nongalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council.
 - 1. Apply alkyd metal primer over bare and shop primed metal. Prepare the surface to be painted according to manufacturers recommendation.
- F. Galvanized Surfaces: Clean galvanized surfaces with non-petroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- G. Materials Preparation: Carefully mix and prepare paint materials in accordance with manufacturers directions.
 - 1. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.
 - 2. Stir materials before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
 - 3. Use only thinners approved by the paint manufacturer, and only within recommended limits.

3.3 APPLICATION

- A. Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 - 1. Paint colors, surface treatments, and finishes are indicated in "schedules".
 - 2. Provide finish coats that are compatible with primers used.
 - 3. The number of coats and film thickness required is the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce an even smooth surface in accordance with the manufacturer's directions.
 - 4. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
 - 5. The term "exposed surfaces" includes surfaces visible when installed. Extend coatings in these areas as required to maintain the system integrity and provide desired protection.
 - 6. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment.
 - 7. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint.
 - 8. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.

9. Finish exterior doors on tops, bottoms, and side edges same as exterior faces.
 10. Sand lightly between each succeeding enamel or varnish coat.
 11. Omit primer on metal surfaces that have been shop-primed and touch up painted.
- C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
1. Allow sufficient time between successive coatings to permit proper drying. Do not recoat until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure and where application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- D. Minimum Coating Thickness: Apply materials at not less than the manufacturer's recommended spreading rate. Provide a total dry film thickness of the entire system as recommended by the manufacturer.
- E. Mechanical and Electrical Work: Painting mechanical and electrical work is limited to those items exposed in mechanical equipment rooms and in occupied spaces.
- F. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with all pores completely filled.
- G. Prime Coats: Before application of finish coats, apply a prime coat of material as recommended by the manufacturer to material that is required to be painted or finished and has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to assure a finish coat with no burn through or other defects due to insufficient sealing.
- H. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

3.4 CLEANING

- A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
- B. Upon completion of painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping, using care not to scratch or damage adjacent finished surfaces.

3.5 PROTECTION

- A. Protect work of other trades, whether to be painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
- B. Provide "wet paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.
 1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

Paint Schedule:

3.6 EXTERIOR PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates indicated.
1. Concrete Masonry Units, including brick and EIFS:
 - a. Waterproofing Masonry Coating – For application over all exterior brick and EIFS as shown on plans
 - .1 Primer two coats: Masonry Block Filler
 - .2 First Coat: Waterproofing Masonry Coating
 - .4 Second Coat: Waterproofing Masonry Coating
 2. Gypsum Board:
 - a. Exterior Flat Acrylic Emulsion:
 - .1 Primer: Exterior Acrylic Primer
 - .2 First Coat: Exterior Flat Acrylic Emulsion
 - .3 Second Coat: Exterior Flat Acrylic Emulsion.
 3. Ferrous Metal:
 - a. Exterior DTM Acrylic Semi Gloss Finish: 2 finish coats over primer.
 - .1 Primer: Synthetic Rust-Inhibiting Primer.
 - .2 First Coat: DTM Water Borne Acrylic Semi Gloss Enamel.
 - .3 Second Coat: DTM Water Borne Acrylic Semi Gloss Enamel.
 4. Zinc-Coated Metal:
 - a. Exterior DTM Acrylic Semi Gloss Finish: 2 finish coats over primer.
 - .1 Primer: Galvanized Metal Primer.
 - .2 First Coat: DTM Water Borne Acrylic Semi Gloss Enamel.
 - .3 Second Coat: DTM Water Borne Acrylic Semi Gloss Enamel
 5. Ferrous Metal (Handrails only):
 - a. Exterior Gloss Urathane Finish: 2 finish coats over primer.
 - .1 Primer: Epoxy Metal Primer.
 - .2 First Coat: Exterior Gloss Urethane Enamel.
 - .3 Second Coat: Exterior Gloss Urethane Enamel.

3.7 INTERIOR PAINT SCHEDULE

- A. General: Provide the following paint systems for the various substrates, as indicated.
1. Concrete Masonry Units:
 - a. Pre Catalyzed Semi Gloss Acrylic Epoxy
 - .1 Primer two coats: High-Performance Epoxy Block Filler

- .2 First Coat: Pre Catalyzed Semi Gloss Acrylic Epoxy
- .4 Second Coat: Pre Catalyzed Semi Gloss Acrylic Epoxy
- 2. Gypsum Drywall Systems:
 - a. Pre Catalyzed Semi Gloss Acrylic Epoxy: 2 finish coats over primer, at exposed gypsum drywall.
 - .1 Primer: 100% Acrylic Interior Primer.
 - .2 First Coat: Pre Catalyzed Semi Gloss Acrylic Epoxy.
 - .3 Second Coat: Pre Catalyzed Semi Gloss Acrylic Epoxy.
 - b. Primer Finish: Primer, at concealed gypsum drywall.
 - .1 Primer: 100% Acrylic Interior Primer.
- 3. Ferrous Metal:
 - a. Semi-Gloss Finish: 2 finish coats over primer.
 - .1 Primer: Synthetic Rust-Inhibiting Primer.
 - .2 First Coat: Alkyd Gloss Enamel.
 - .3 Second Coat: Alkyd Gloss Enamel.
- 4. Zinc-Coated Metal:
 - a. Semi-Gloss Finish: 2 finish coats over primer.
 - .1 Primer: Galvanized Metal Primer.
 - .2 First Coat: Latex-Based Interior Semi-Gloss Paint.
 - .3 Second Coat: Latex-Based Interior Semi-Gloss Paint.
- 5. Stained Woodwork:
 - a. Stained-Satin Finish: 2 finish coats over stain.
 - .1 Stain Coat: Oil-Type Interior Wood Stain.
 - .2 First Coat: Gloss Polyurethane (Thin per manufacturer recommendation).
 - .3 Second Coat: Satin Polyurethane.
- 5. Exposed Concrete Floors: (PC)
 - .1 Primer Coat: PPG Perma Crete Concrete Stain
 - .2 Finish Coat: PPG Perma Crete Concrete Stain

END OF SECTION 09900

SECTION 10425 - SIGNS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Plastic interior panel signs.
 - 1. Room Identification.
 - 2. Restroom.
- B. Plastic exterior panel signs.
 - 1. Room Identification.

1.2 REFERENCES

- A. ANSI 117.1 – For Buildings and Facilities.
- B. ASTM International (ASTM):
 - 1. PHYSICAL
 - 1. ASTM D792 – Specific Gravity
 - 2. ASTM D542 – Optical Refractive Index
 - 3. ASTM D1003 – Light Trans - Total, Light Trans - Haze
 - 4. ASTM D570 – Water Absorption by weight
 - 2. MECHANICAL
 - 1. ASTM D638 – Tensile Strength
 - 2. ASTM D790 – Tensile Modulus of Elasticity, Flexural Strength, Flexural Modulus of Elasticity
 - 3. ASTM D256 – Izod Impact Strength Molded - Milled Notch
 - 4. ASTM D785 – Rockwell Hardness
 - 5. ASTM D3763 – Drop Dart Impact
 - 6. ASTM D732 – Shear Strength
 - 7. ASTM D695 – Compressive Strength
 - 3. THERMAL
 - 1. ASTM D648 – Deflection Temperature @ 264 psi, Deflection Temperature @ 66 psi
 - 2. ASTM D696 – Coefficient of Thermo Expansion
 - 3. ASTM D635 – Flammability (Burning Rate)
 - 4. ASTM D2843 – Smoke Density Rating
 - 5. ASTM D1929 – Self-Ignition Temp
 - 6. ASTM E84 – Flame Spread Index
 - 7. ASTM D84 – Smoke Development Index
 - 8. ASTM D3418 – Glass Transition Temperature
 - 4. ELECTRICAL
 - 1. ASTM D150 – Dielectric Constant @ 1KHz, Dielectric Constant @ 1MHz
 - 2. ASTM D149 – Dielectric Strength
- C. Underwriters Laboratories (UL):
 - 1. UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.
 - 2. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide photopolymer signage that conforms to the requirements of all regulatory agencies holding jurisdiction.
- B. Requirements:
 - 1. Comply with all applicable provisions of the 2010 ADA Standard for Accessible Design.
 - 2. Character Proportion: Letters and numbers on signs must have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10.
 - 3. Color Contrast: Characters and symbols must contrast with their background - either light characters on a dark background or dark characters on a light background.
 - 4. Raised Characters or Symbols: Letters and numbers on signs must be raised 1/32 in (0.8 mm) minimum and be sans serif characters. Raised characters or symbols must be at least 5/8 in (16 mm) high but no higher than 2 in (50 mm). Symbols or pictograms on signs must be raised 1/32 in (0.8 mm) minimum.
 - 5. Symbols of Accessibility: Accessible facilities required to be identified must use the international symbol of accessibility.
 - 6. Braille: Grade II with accompanying text.
- C. Fire Performance Characteristics:
 - 1. Provide photopolymer signage with surface burning characteristics that consist of a flame spread (ASTM E84) of 85 and a smoke development (ASTM D84) of 450 when tested in accordance to UL 723 (ASTM E84).
 - 2. Self-Extinguishing: Provide photopolymer signage with a CC1 classification for .060 in thick material when tested in accordance with the procedures in ASTM D 635, Standard Test Method for Rate of Burning and/or Extent and Time of Burning Plastics in a Horizontal Position.
 - 3. Vertical Burn: Provide photopolymer material that is classified as 94V-2 for material .118 in thick or greater and 94HB for material .118 in thick or less when tested in accordance with UL 94, Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.
 - 4. Self-Ignition Temperature: Provide photopolymer material that has a self-ignition temperature of 800 degrees F (427 degrees C) when tested in accordance with ASTM D 1929.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Detail drawings showing sizes, lettering and graphics, construction details of each type of sign and mounting details with appropriate fasteners for specific project substrates.
- D. Manufacturer's Installation Instructions: Printed installation instructions for each signage system.
- E. Message List: Signage report indicating signage location, text and sign type.
- F. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and available pictograms, characters, and Braille indications.
- G. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and typical pictograms, characters, and Braille indications.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum two years documented experience in work of this Section.
- B. Installer Qualifications: Minimum two years documented experience in work of this Section.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Furnish signs designated by Architect.
 - 2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in unopened factory packaging.
- B. Inspect materials at delivery to verify there are no defects or damage.
- C. Store products in manufacturer's original packaging until ready for installation in climate controlled location away from direct sunlight.
- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

- A. Install products in an interior climate controlled environment.
- B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Nova Polymers, Inc; 8 Evans Street, Suite 201, Fairfield, NJ 07004. ASD.
- B. Requests for substitutions will be considered in accordance with provisions of Section 00020.

2.2 SIGNAGE - GENERAL

- A. It is the intent of these specifications to establish a sign standard for the Owner including but not limited to, wall-mounted directional signs, primary room identification, restrooms, conference rooms and all code compliant Braille signage.
- B. Comply with all applicable provisions of the 2010 ADA Standard for Accessible Design codes that apply to the State and Local jurisdiction of the project.
- C. Typography: Copy shall be a clean and accurate reproduction of typeface(s) specified. All font to be all-caps. Letter spacing to be set by manufacturer.

- D. Arrows, symbols and pictograms will be provided in style, sizes, colors and spacing as indicated in drawings for each sign system.
- E. Braille:
 - 1. Grade 2 Braille. Comply with the Americans with Disabilities Act.
- F. Design:
 - 1. Text/Graphics Placement: Centered.
 - 2. Font: Futura.

2.3 INTERIOR SIGNAGE

- A. Panel Material: Novacryl PT Series Photopolymer
 - 1. Composition: 0.032 inch (0.8 mm) thick moisture resistant, non-glare interior nylon photopolymer on ultraviolet resistant clear PETG sign base, single piece construction. Laminated photopolymers, added-on characters, and engraved characters are not acceptable.
 - 2. Base thickness: 0.190 inch (4.8 mm) Non-glare PETG.
 - 3. Type and Color: To be selected from manufacturer's full color range by Architect.
 - 4. Size: 6" x 8"
 - 5. Surface burning characteristics: Flame spread/smoke developed rating less than 75/120, tested to \approx STM E 84 and UL 723.
 - 6. Rate of burning: Tested to \approx STM D 635 at nominal 0.060 inch (1.5 mm) thickness with resulting Classification CC1.
 - 7. Vertical burning: Tested to UL 94, classified as 94V-2 in thickness of 0.118 inch (3.0 mm) or greater and 94HB in thicknesses less than 0.118 inch (3.0 mm).
 - 8. Self-ignition temperature: 800 degrees F (427 degrees C), tested to ASTM D 1929.

2.4 EXTERIOR SIGNAGE

- A. Panel Material: Novacryl EX Series Photopolymer.
 - 1. Composition: 0.032 inch (0.8 mm) thick exterior-grade photopolymer resin bonded to 0.016 inch (0.4 mm) thick aluminum alloy base.
 - 2. Base thickness: 0.016 inch (0.4 mm) thick brushed aluminum alloy base.
 - 3. Type and Color: To be selected from manufacturer's full color range by Architect.
 - 4. Size: 6" x 8".

2.5 ACCESSORIES

- A. Adhesive:
 - 1. Type recommended by sign manufacturer.
 - 2. Maximum volatile organic compound (VOC) content: 70 grams per liter.

2.6 FABRICATION

- A. Fabricate panel material in accordance with manufacturer's instructions and approved shop drawings.
- B. Fabricate signs by photo polymer process using film negatives to produce characters and graphics in contrasting color, raised. Refer to Signage Schedule.
- C. Characters:
 - 1. Height: Room Numbers: 1". Room Names: 5/8"
 - 2. Width to height ratio: Comply with ADA.
 - 3. Stroke width to height ratio: Comply with ADA.

- D. Pictograms: As required by the ADA.
- E. Provide Braille Grade indications for each character.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

PART 4 SCHEDULE

4.1 Schedule

- A. Provide room signage at each entrance into each space. All signage to include the room name and number. Provide all graphics as required by the American with Disabilities Act.

END OF SECTION

SECTION 10511 – METAL EVIDENCE LOCKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
Standard and Refrigerated Pass-thru Lockers
- B. Related Work, Not Furnished:
Finish floor covering materials and installation.
- C. Related Sections:
[Sections in Division 9 – Finishes, relating to finish floor and base materials.]

1.3 REFERENCES

- A. American National Standards Institute (ANSI) Standards:
Applicable standards for fasteners used for assembly.
- B. American Society for Testing and Materials (ASTM) Standards:
Applicable standards for steel sheet materials used for fabrication.
Applicable standards for the testing of electrostatically applied Powder Coat Paint
- C. American Institute Of Steel Construction (AISC) Standards:
Applicable standards for steel materials used for fabrication.

1.4 DESCRIPTION

- A. General: Metal Evidence Lockers
- B. Finishes:
Fabricated Metal Components and Assemblies: All components to be painted with an electrostatically 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.
- C. Sizes:

Nominal depth of 24 inches. Heights and widths as noted on drawings.

1.5 PERFORMANCE REQUIREMENTS

- A. Design Requirements:
- B. Limit overall width to 0.032 inches greater or less than the nominal specified width.
- C. Seismic Performance: Provide Metal Evidence lockers capable of withstanding the effects of earthquake movement when required by applicable building codes.

1.6 SUBMITTALS

- A. Product Data: Submit manufacturer's product literature and installation instructions for each type of evidence lockers required. Include data substantiating that products to be furnished comply with requirements of the contract documents.
- B. Shop Drawings: Show fabrication, assembly, and installation details including descriptions of procedures and diagrams. Show complete extent of evidence lockers installation layout including quantities, locations and types of accessory units required. Include notations and descriptions of all installation items and components.

Show installation details at non-standard conditions, if any.

Provide layout, dimensions, and identification of each unit corresponding to sequence of installation procedures.

Provide installation schedule and procedures to ensure proper installation.
- C. Samples: Provide minimum 3 inch (76MM) square example of each color and texture on actual substrate for each component to remain exposed after installation.
- D. 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.
- E. Warranty: Submit draft copy of proposed warranty for review by the Architect or Designer.
- F. Maintenance Data: provide written documentation of the manufacturer's statement claiming the maintenance free nature of the product.
- G. [Reference List: Provide a list of recently installed evidence lockers to be visited by owner, architect, and contractor. Intent of list is to aid in verifying the suitability of manufacturer's products and comparison with materials and product specified in this section.]

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Engage an experienced manufacturer who is ISO 9001 certified for the design, production, installation and service of evidence lockers. Furnish certification attesting ISO 9001 quality system registration.
- B. Installer Qualifications: Engage an experienced installer who is a manufacturer's authorized representative for the specified products for installing evidence lockers.

Minimum Qualifications: 5-years experience installing evidence lockers of comparable size and complexity to specified project requirements.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Follow manufacturer's instructions and recommendations for delivery, storage and handling requirements.

1.9 PROJECT CONDITIONS

- A. Field Measurements: Verify quantities of evidence lockers 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 evidence lockers units without field measurements. Coordinate construction to ensure actual dimensions correspond to established dimensions.

1.10 SEQUENCING AND SCHEDULING

- A. Sequence evidence lockers units with other work to minimize possibility of damage and soiling during remainder of construction period.
- B. Schedule installation of specified evidence lockers after finishing operations; including painting have been completed.
- C. Provide components which must be built in at a time which causes no delays general progress of the Work.
- D. Pre-installation Conference: Schedule and conduct conference on project site to review methods and procedures for installing evidence lockers including, but not limited to the following:

Recommended attendees include:

- 1. Owner's Representative.
- 2. Prime Contractor or representative.
- 3. The Architect.
- 4. Manufacturer's representative.
- 5. Subcontractors or installers whose work may affect or be affected by the work of this section.

1.11 WARRANTY

- A. Provide a written warranty executed by Contractor, Installer and Manufacturer, agreeing to repair or replace units which fail in materials or workmanship within the established warranty period. This warranty shall be in addition to and not a limitation of other rights the Owner may have under the General Conditions provisions of the Contract Documents.

- 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. Warrant the original purchaser exclusively that all moving parts manufactured by it will be free from defects in materials and workmanship for 5 years.
- C. Warrants that all refrigeration units shall be free from defects in materials and workmanship for one (1) year from the date of the customer's written acceptance of installation. During the 1-year warranty period, all parts are included at no cost for 1 year. Labor is included at no cost during the first year of the 1-year warranty period. After the first year of the 1-year warranty, all labor will be charged at the current rate.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Chain of Custody lockers by Southwest Solutions Group 2535-B State Hwy 121, Ste 110, Lewisville, TX 75056 Telephone: 1-800-803-1083.
- B. The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution
- C. Alternate manufacturers may be considered by showing evidence of 5 years of experience in the manufacture and/or supply of the products herein, without deviation. See section -00030 for further information.
- D. BASIC MATERIALS
- E. General: Provide materials and quality of workmanship, which meets or exceeds established industry standards for products specified. Use furniture grade sheet metal and fasteners for component fabrication unless indicated otherwise. Material thicknesses/gauges are manufacturer's option unless indicated otherwise.

2.2 LOCKER TYPES

- A. Pass-thru evidence lockers.
- B. Non pass-thru evidence lockers.
- C. Pass-thru refrigerated evidence lockers.

2.3 MANUFACTURED COMPONENTS, STANDARD EVIDENCE LOCKERS

- A. Welded Frame:
 - 1. The welded frame is structural and shall consist of top, bottom, back and sides constructed of a minimum of 18 gage (1.21MM) steel. All frame components shall be joined using resistance welding. Riveting or bolting of structural members will not be permitted.

2. Horizontal and vertical outer front flanges will be a minimum of 1.5 inches (38MM). Horizontal and vertical flanges will overlap with a minimum of 2 resistance welds per corner.
3. Center vertical lock housing is structural and will run the full height and depth of the locker. All locks will be completely enclosed by a full height removable panel. Pass-thru rear release mechanisms will be completely enclosed by the lock housing and accessible only when the rear door is open. Provide engagement points for the anti-pry tabs that are on all front doors.
4. Exposed lock mechanisms that can snag evidence and be obstructed by stored articles will not be permitted.

B. Welded Bases:

1. Each welded base shall be permanently affixed to each locker using modern Inert Gas Metal Arc Welding techniques for lateral unit stability. The base shall be a minimum of 14 gage (1.98MM) steel 4 inches (101MM) high with a 1.5 inch (38MM) return on the bottom for support.
2. Provide four 0.375 inch (9.5MM) mounting holes and four 0.375 inch (9.5MM) nuts welded in place for the mounting of floor levelers. Provide four appliance levelers per locker.
3. Provide removable access panels for access to mounting holes and leveling points.

C. Shelves:

1. Shall be a single-piece formed from a minimum of 18-gage (1.21MM) cold rolled steel with a double 90-degree bend on the rear of the shelf and a double 90-degree bend on the front of the shelf. Shelf sides shall be turned up 90-degrees for ease of cleaning and to prevent debris from becoming caught between the shelf and the sidewall.
2. All shelves shall be welded into place. Rivets, screws, bolts or other loose fasteners will not be permitted for the fastening of shelves to the locker frame.

D. Locks:

1. Patent Pending. Lock shall be push button locking with a stainless steel push button and alignment bezel. Locks shall be a one-piece removable design. Locks will secure the door with the single push of a button with no other action required by the user.
2. Locks will be deadbolt type locks with multi-point engagement. Rotary latches or cam locks will not be tolerated.
3. Pass-thru locks will be reset from the rear of the locker when the rear door is in the open position only.
4. Non-Pass-thru locks will be reset from the front of the locker using tube type locks keyed to differ.
5. Provide documentation for cycle testing where locks are tested successfully to a minimum 40,000 cycles without failure.
6. Locks shall be pre-lubricated with no maintenance required for the lifetime of the unit (estimated at 20 years).

E. One Piece Welded Doors:

1. Shall be formed from two pieces of minimum 18-gauge (1.2MM) cold rolled steel box formed and welded together using modern GMAW techniques. The one piece door with inner and outer door skins shall have a combined steel thickness of no less than 0.096 inches (2.4MM) thick.
2. Each door shall have a nickel plated, flush mounted door handle installed with fasteners visible only in the unlocked position.
3. Provide neoprene silencers on each door.
4. Provide anti-pry tabs that engage with the Center Vertical Lock Housing when the door is locked.
5. Doors shall have no moving parts except the door and the hinge.
6. Provide stainless steel spring loaded hinges that are welded to prevent pin removal. Spring loaded hinges shall be capable of holding the door closed and flush with the door frame. Doors that hang ajar are a safety concern and will not be tolerated.

F. Rear Doors (Pass-thru lockers)

1. Shall be formed from two pieces of minimum 18-gauge (1.2MM) cold rolled steel box formed and welded together using modern Inert Gas Metal Arc Welding techniques. The one piece door with inner and outer door skins shall have a combined steel thickness of no less than 0.096 inches (2.4MM) thick.
2. Each locker module shall have one rear door each and allow evidence to be removed from all compartments at once.
3. Each rear door shall have multi-point engagement with a built-in L handle lock. Access to all lock mechanisms shall be hidden behind cover plates that are secured with tamperproof fasteners.

G. ACCESSORIES:

1. Front door lock out system: Provide manufacturer's standard.

2.4 MANUFACTURED COMPONENTS, REFRIGERATED EVIDENCE LOCKERS

A. Small Refrigerators

1. Model RSD4-4
2. Factory installed into a standard evidence locker.
3. Pass-thru is emptied and reset from the rear at the push of a button.
4. Shall have a stainless-steel interior with spring loaded door hinges to hold each door closed.
5. Shall have magnetic seals on outer doors
6. Shall have circulation fans that can maintain a consistent temperature throughout the interior of the fridge.
7. Shall have digital controls with settings preset to maintain 38° to 42° Fahrenheit.
8. Shall have an audible alarm.

2.5 FABRICATION

- A. General: Coordinate fabrication and delivery to ensure no delay in progress of the Work.

2.6 FINISHES

- A. Colors: Selected from manufacturer's standard available colors or provide in custom colors as selected by Architect.
- B. Paint Finish: 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 evidence 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 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.

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. Advise Owner of additional protection needed to ensure that system will be without damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 10520 - FIRE-PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Portable fire extinguishers.
 - 2. Fire-protection cabinets for the following:
 - a. Portable fire extinguishers.
 - 3. Fire-protection accessories.
- B. Related Sections include the following:
 - 1. Division 9 Section "Painting" for field-painting fire-protection cabinets.
 - 2. Division 10 Section "Signs" for directional signage to out-of-sight fire extinguishers and cabinets.
 - 3. Division 11 Section "Food Service Equipment" for fire extinguishing systems provided as part of exhaust hoods.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire-protection specialties.
 - 1. Fire Extinguishers: Include rating and classification.
 - 2. Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain fire extinguishers and cabinets through one source from a single manufacturer.
- B. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Standard for Portable Fire Extinguishers."
- C. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.
 - 1. Provide extinguishers listed and labeled by FM.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Portable Fire Extinguishers:
 - a. Amerex Corporation.
 - b. Ansul Incorporated.
 - c. Badger; Div. of Figgie Fire Protection Systems.
 - d. Buckeye Fire Equipment Company.
 - e. Fire-End & Croker Corporation.
 - f. J.L. Industries, Inc.
 - g. Kidde: Walter Kidde, The Fire Extinguisher Co.
 - h. Larsen's Manufacturing Company.
 - i. Moon/American, Inc.
 - j. Pem All; Div. of Pem Systems, Inc.
 - k. Potter-Roemer; Div. of Smith Industries, Inc.
 - l. Pyro-Chem; Tyco Safety Products

2.2 PORTABLE FIRE EXTINGUISHERS

- A. General: Provide fire extinguishers of type, size, and capacity for each cabinet and other locations indicated.
- B. Multipurpose Dry-Chemical Type: UL-rated 4-A:60-B:C, 10-lb (4.5-kg) nominal capacity, in enameled-steel container as shown on drawings.
- C. K-type. Provide two K-type extinguishers for the kitchen area. Locate with Owner/Architect.

2.3 FIRE-PROTECTION CABINETS

- A. Cabinet Construction: Provide manufacturer's standard box (tub), with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated, sized to fit specified extinguisher. Weld joints and grind smooth. Miter and weld perimeter door frames.
 - 1. Cabinet Metal: Enameled-steel sheet.
- B. Cabinet Type: Suitable for the following:
 - 1. Fire extinguisher.
- C. Cabinet Mounting: Suitable for the following mounting conditions:
 - 1. Semirecessed: Cabinet box partially recessed in walls of shallow depth to suit style of trim indicated.
- D. Cabinet Trim Style: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.
 - 1. Exposed Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
 - b. Rolled-Edge Trim: 4-inch (102-mm) backbend depth.

E. Cabinet Trim Material: Manufacturer's standard, as follows:

1. Same metal and finish as door.

F. Door Material: Manufacturer's standard, as follows:

1. Aluminum sheet.

G. Door Glazing: Manufacturer's standard, as follows:

1. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, as follows:
 - a. Class 1 (clear), 1/8" Thickness.
 - b. Cabinets in gymnasium shall have solid doors without glazing.

H. Door Hardware: Provide manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide either lever handle with cam-action latch, or exposed or concealed door pull and friction latch. Provide concealed or continuous-type hinge permitting door to open 180 degrees.

2.4 ACCESSORIES

A. Mounting Brackets: Manufacturer's standard steel, designed to secure extinguisher, of sizes required for types and capacities of extinguishers indicated, with plated or baked-enamel finish.

1. Provide brackets for extinguishers located in cabinets.

2.5 COLORS AND TEXTURES

A. Colors and Textures: As selected by Architect from manufacturer's full range for these characteristics.

2.6 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.7 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 607.1.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine roughing-in for hose valves, hose racks, and cabinets to verify actual locations of piping connections before cabinet installation.
- B. Examine walls and partitions for suitable framing depth and blocking where recessed and semirecessed cabinets are to be installed.
- C. Examine fire extinguishers for proper charging and tagging.
 - 1. Remove and replace damaged, defective, or undercharged units.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Comply with manufacturer's written instructions for installing fire-protection specialties.
- B. Install in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction. Mount the cabinet so that the handle is at 48" to center.
 - 1. Prepare recesses for cabinets as required by type and size of cabinet and trim style.

3.3 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust cabinet doors that do not swing or operate freely.
- B. Refinish or replace cabinets and doors damaged during installation.
- C. Provide final protection and maintain conditions that ensure that cabinets and doors are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 10520

SECTION 10530 - PROTECTIVE COVERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Extent of section includes all labor and materials to provide a complete walkway cover system per manufacturers specifications.
- B. Furnish all labor, materials, tools, equipment and services for Protective Covers. Provide and install all miscellaneous items, appurtenances and devices, incidental to or necessary for a sound, secure and complete system.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's literature and installation instructions.
- B. Shop Drawings: Submit shop drawings showing layout, attachment method, and details.
 - 1. Where installed products are indicated to comply with certain structural design loadings, include structural computations, material properties, and other information needed for structural analysis which has been prepared and sealed by a qualified professional engineer licensed to practice in the jurisdiction where units will be installed.
 - 2. Indicate reactions to be transferred to supporting structure.
- C. Reference Section 01330-Submittal Procedures; submit following items:
 - 1. Product data.
 - 2. Shop Drawings: Layout and erection drawings showing roof framing, deck panels, cross sections and trim details clearly indicating proper assembly.
 - 3. Samples: Color selection samples consisting of actual coating material or anodizing process on aluminum extrusions.
 - 4. Quality Assurance/Control Submittals:
 - a. Qualifications: Letter certifying manufacturer's required qualifications.
 - b. Manufacturer's Installation Instructions.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Obtain protective cover system components from a single manufacturer with not less than 5 years of production experience, whose published literature indicates compliance with requirements of this section.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Check actual locations of construction to which protective covers must fit by accurate field measurements before fabrication; show measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.
- B. Where field measurements cannot be made without delaying the work, guarantee dimensions and proceed with fabrication. Coordinate construction to ensure that actual dimensions correspond to guaranteed dimensions.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle material in accordance with the manufacturer's instructions, and to prevent damage. Discard damaged components.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. These specifications are based on Perfection Architectural Systems. Products by Peachtree Protective Covers and Mitchell Metals and Tennessee Valley Metals shall also be acceptable.

2.2 MATERIALS

- A. Aluminum Extrusions: 6063 alloy, T-6 temper.
- B. Grout: 1 part Portland cement, 3 parts masonry sand; 2,000 psi (13.8 MPa) compressive strength.
- C. Foam Block-Outs: Rigid foam blocks sized as required for column embedment depth and shape.

2.3 COMPONENTS

- A. Columns:
 - 1. 6" x 6" Radius-cornered aluminum tubular.
 - 2. Grout Key: Provide two 1-½ inch (38 mm) diameter holes in column base, one each in opposite sides.
 - 3. Provide clear acrylic protection coat on surfaces in contact with grout.
- B. Beams: 6" x 6" Open top aluminum tubular extrusions as confirmed by structural engineering design.
- C. Deck: 3" x 6" x .060" Rigid-Roll-Lock extruded aluminum, self-flashing, interlocking as confirmed by structural engineering design.
 - 1. Provide welded endplate water dams where sections terminate at other than drainage channels.
- D. Fascia: Provide manufacturer's 4" x 7" x .094" extruded aluminum fascia and gutter sections as required to complete the installation resulting in a neat finished appearance.
- E. Flashing: Aluminum sheet, thickness as recommended by manufacturer for specific condition.
- F. Struts: 1 ½" x 1 ½" x .100" extruded aluminum tube.

2.4 ACCESSORIES

- A. Fasteners:
 - 1. Deck Screws: No. 14 x 1 inch (25 mm), self-tapping, Type 18-8 stainless steel with neoprene washer.
 - 2. Trim Screws: No. 10 x ½ inch (13 mm), self-tapping, Type 18-8 stainless steel.

2.5 FABRICATION

- A. Shop Assembly: Fabricate cross beams and columns into one piece rigid bents with corners mitered and heli-arc welded to the extent that completed bents can be shipped on local, state and federal highways without special permit. Provide bolted connections for bents that are required to be shipped unassembled.

2.6 FINISH

- A. Finish all components with Fluoropolymer Coating: 70 percent PVDF resin based fluoropolymer, AA-C-12C-42R-1, custom color as selected by architect, comply with AAMA 605.
 - 1. Three coat application.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine footings in which bents will be set [and building surfaces to which canopy will connect]. Verify footing locations and elevations comply with shop drawings.
- B. Coordinate with responsible entity to perform corrective work on unsatisfactory footings or surfaces.
- C. Commencement of work by installer is acceptance of existing conditions.

3.2 ERECTION

- A. Erect canopy in accordance with manufacturer's installation instructions.
- B. Set bents plumb, straight and true to line, adequately braced to maintain position until grout has cured.

3.3 CLEANING

- A. Clean surfaces soiled by work as recommended by manufacturer.
- B. Remove surplus materials and debris from the site.

3.4 PROTECTION

- A. Protect finished aluminum surfaces from damage due to subsequent operations through final acceptance by the Owner.

END OF SECTION 10530

SECTION 10801 - TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Toilet and bath accessories.
 - 2. Underlavatory guards.
- B. Related Sections include the following:
 - 1. Division 10 Section "Toilet Compartments" for compartments and screens.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions and thicknesses, dimensions, profiles, fastening and mounting methods, specified options, and finishes for each type of accessory specified.
- B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required. Use designations indicated in the Toilet and Bath Accessory Schedule and room designations indicated on Drawings.
- C. Maintenance Data: For accessories to include in maintenance manuals specified in Division 1. Provide lists of replacement parts and service recommendations.

1.4 QUALITY ASSURANCE

- A. Product Options: Accessory requirements, including those for materials, finishes, dimensions, capacities, and performance, are established by specific products indicated in the Toilet and Bath Accessory Schedule.
 - 1. Other manufacturers' products with equal characteristics may be considered. See Division 1 Section "Substitutions."
 - 2. Do not modify aesthetic effects, as judged solely by Architect, except with Architect's approval. Where modifications are proposed, submit comprehensive explanatory data to Architect for review.

1.5 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by disabled persons, proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.6 WARRANTY

- A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering accessories that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Toilet and Bath Accessories:
 - a. American Specialties, Inc.
 - b. Bobrick Washroom Equipment, Inc.
 - c. Bradley Corporation.
 - d. General Accessory Manufacturing Co. (GAMCO).
 - 2. Underlavatory Guards:
 - a. Plumberex, Inc.
 - b. Truebro, Inc.
 - c. TCI
- B. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, those indicated in the Toilet and Bath Accessory Schedule as shown on drawings.

2.2 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, with No. 4 finish (satin), in 0.0312-inch (0.8-mm) minimum nominal thickness, unless otherwise indicated.
- B. Brass: ASTM B 19, leaded and unleaded flat products; ASTM B 16 (ASTM B 16M), rods, shapes, forgings, and flat products with finished edges; ASTM B 30, castings.
- C. Sheet Steel: ASTM A 366/A 366M, cold rolled, commercial quality, 0.0359-inch (0.9-mm) minimum nominal thickness; surface preparation and metal pretreatment as required for applied finish.
- D. Galvanized Steel Sheet: ASTM A 653/A 653M, G60 (Z180).
- E. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service), nickel plus chromium electrodeposited on base metal.
- F. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- G. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.

2.3 FABRICATION

- A. General: Names or labels are not permitted on exposed faces of accessories. On interior surface not exposed to view or on back surface of each accessory, provide printed, waterproof label or stamped nameplate indicating manufacturer's name and product model number.
- B. Surface-Mounted Toilet Accessories: Unless otherwise indicated, fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with continuous stainless-steel hinge. Provide concealed anchorage where possible.
- C. Recessed Toilet Accessories: Unless otherwise indicated, fabricate units of all-welded construction, without mitered corners. Hang doors and access panels with full-length, stainless-steel hinge. Provide anchorage that is fully concealed when unit is closed.
- D. Mirror-Unit Hangers: Provide mirror-unit mounting system that permits rigid, tamper- and theft-resistant installation with concealed fasteners.
- E. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Secure mirrors to walls in concealed, tamper-resistant manner with special hangers, toggle bolts, or screws. Set units level, plumb, and square at locations indicated, according to manufacturer's written instructions for substrate indicated.
- C. Install grab bars to withstand a downward load of at least 250 lbf (1112 N), when tested according to method in ASTM F 446.

3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 10801

SECTION 11150 - BULLET-RESISTANT Transaction Drawer

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Bullet-resistant Sliding Transaction drawer.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

- A. American Welding Society (AWS) D1.3/D1.3M - Structural Welding Code - Sheet Steel.
- B. ASTM International (ASTM) A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- C. Underwriters Laboratories (UL) 752 - Bullet Resisting Equipment.

1.3 SYSTEM DESCRIPTION

- A. Design Requirements: Provide drawer with "non-ricochet type" intended to permit capture and retention of attacking projectile, lessening potential of random injury or lateral penetration for levels 3.

1.4 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Include profiles and sizes, reinforcement size and locations, details of joints and connections.
 - 2. Product Data: Include product description for drawer including bullet-resistant ratings.

1.5 QUALITY ASSURANCE

- A. Transaction Drawers: Ballistic Level 3 to UL 752.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Store drawers in protected, dry area, off ground or floor.
- B. Do not cover with non vented coverings that create excessive humidity.
- C. Remove wet coverings immediately.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A Basis of Design: Model 6003 by ARMORTEX. For 8" CMU wall, Level 3 Bullet Resistance. 5926 Corridor Parkway, Schertz, Texas, 800-880-8306, www.armortex.com.

- B Substitutions: Under provisions of Division 00020

2.2 MATERIALS

- A Steel Sheet:
 - 1. ASTM A1008/1008M, cold rolled, free from scale, pitting, coil breaks, and other surface defects.
- B Bullet-Resistant Composite: UL Listed Bullet Resistant Composite by ARMORTEX, of UL Ballistic Level equal to specified frame ballistic protection level.

2.3 FABRICATION

:

- A Drawers
 - 1. Fabricate Case from 16 gage steel
 - 2. Face 16ga #3 Brushed Stainless Steel
 - 3. Stainless Steel mounting flange.
 - 4. Heavy duty drawer slides
- B Welding: In accordance with AWS D1.3/D1.3M. Grind exposed welds flush and smooth.
- C Finish work neat and free from defects.

2.4 FINISHES

- A Stainless Steel: No. 3 brushed finish.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install drawer in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Set with flanges on top of counter
- C. Secure to adjacent using fastener type best suited to application.

END OF SECTION

SECTION 12241 - ROLLER WINDOW SHADES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Manually operated roller shades with single rollers.
2. Provide all components necessary for a fully operational system.

1.2 ACTION SUBMITTALS

- A. Product Data:** For each type of product.
- B. Shop Drawings:** Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.
- C. Samples:** For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

- A. Product certificates.**
- B. Product test reports.**

1.4 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.**

1.5 QUALITY ASSURANCE

- A. Installer Qualifications:** Fabricator of products.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations:** Obtain roller shades from single source from single manufacturer.

2.2 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Draper Inc.
 - 2. Hunter Douglas Contract.
 - 3. Insolroll Window Shading Systems.
- B. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
 - 1. Chain-Retainer Type: Chain tensioner, jamb mounted
 - 2. Spring Lift-Assist Mechanisms: Provide for shadebands that weigh more than 10 lb or for shades as recommended by manufacturer, whichever criterion is more stringent.
- C. Rollers: Extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
 - 1. Roller Drive-End Location: Right side of interior face of shade
 - 2. Direction of Shadeband Roll: Regular, from back (exterior face) of roller
- D. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.
- E. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.
- F. Shadebands:
 - 1. Shadeband Material: Light-filtering fabric.
 - 2. Shadeband Bottom (Hem) Bar: Extruded aluminum.
 - a. Type: Enclosed in sealed pocket of shadeband material
 - b. Color and Finish: As selected by Architect from manufacturer's full range
- G. Installation Accessories:
 - 1. Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.
 - 2. Endcap Covers: To cover exposed endcaps.
 - 3. Closure Panel and Wall Clip: Removable aluminum panel designed for installation at bottom of site-constructed ceiling recess or pocket and for snap-in attachment to wall clip without fasteners.
 - 4. Installation Accessories Color and Finish: As selected from manufacturer's full range

2.3 SHADEBAND MATERIALS

- A. Shadeband Material Flame-Resistance Rating: Comply with NFPA 701 Class A. Testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- B. Light-Filtering Fabric: Woven fabric, stain and fade resistant.
 - 1. Source: Roller shade manufacturer.
 - 2. Type: Woven PVC-coated polyester
 - 3. Weave: Basketweave
 - 4. Thickness: Manufacturer's highest quality
 - 5. Weight: Manufacturer's highest quality.
 - 6. Roll Width: 60 inches
 - 7. Orientation on Shadeband: Up the bolt
 - 8. Openness Factor: As Selected by Architect.
 - 9. Color: As selected by Architect from manufacturer's full range.

2.4 ROLLER SHADE FABRICATION

- A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):
 - 1. Between (Inside) Jamb Installation: Total width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch, plus or minus 1/8 inch. Entire window shall be covered with terminations between shades of end-to-end installations at centerlines of mullion or other defined vertical separations between openings. Units may span mullions not to exceed a total length of 10'-0".
- C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible, except as follows:
 - 1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4, provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.
 - 2. Railroaded Materials: Railroad material where material roll width is less than the required width of shadeband and where indicated. Provide battens and seams as required by railroaded material to produce shadebands with full roll-width panel(s) plus, if required, one partial roll-width panel located at top of shadeband.

PART 3 - EXECUTION

3.1 ROLLER SHADE INSTALLATION

- A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.
 - 1. Opaque Shadebands: Located so shadeband is not closer than 2 inches to interior face of glass. Allow clearances for window operation hardware.
- B. Electrical Connections: Connect motor-operated roller shades to building electrical system.
- C. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.
- D. Clean roller shade surfaces, after installation, according to manufacturer's written instructions.
- E. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.2 Schedule

- A. Install manually operated shades at all exterior windows and door lites.

END OF SECTION 12241

SECTION 12304 - GENERAL CASEWORK

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Applicable provisions of General Conditions, Special Conditions and General Requirements shall apply to this section as if repeated in full herein. Reference other Sections and Divisions for work in connection with this section.

1.2 INTENT

- A. It is the purpose of this specification to establish requirements for casework to provide the purchaser with a durable and functional installation.
- B. As the Casework has been designed to meet the functional requirements of each area, it is the desire of the purchaser that door and drawer arrangements, design of casework layouts and work surface materials must not be changed.
- C. Construction methods, joinery, materials, and material thickness shall be strictly adhered to in order to provide the owner with a final installation capable of performing as those specified. Bids proposing to supply casework not meeting these requirements will be rejected.

1.3 WORK INCLUDED

- A. Furnish, deliver, and install to owner's and architect's satisfaction, all prefabricated plastic laminate casework as shown on drawings, schedules and equipment lists.
- B. Furnish and install all fillers, scribes, finished ends, finished backs, work surfaces, backsplashes, and cutouts required to provide a complete and finished project. Plastic laminate work surfaces shall include backer sheet.
- C. Provide sinks and fittings, electrical outlets and fixtures when specifically stated as being part of this contract.
- D. Provide locks where shown on casework drawings or described in equipment lists.

1.4 WORK IN OTHER SECTIONS

- A. All sinks and fittings, couplings and connectors, piping, traps, supplies, shutoffs, and special plumbing fixtures to meet all applicable codes; all electrical fixtures and devices, conduit, wiring and connectors; and all fans, blowers, motors, ductwork, and metal grilles not specified as part of casework contract.
- B. Installation, connection, and testing of all sinks, fittings, electrical fixtures; providing all rough-ins: mechanical piping; electrical runs; and connections required for a complete project.
- C. Blocking, framing, and reinforcement in walls, ceilings, and floors for anchoring of cabinets and trim.
- D. General millwork and running wood trim items.
- E. Vinyl base molding.

1.5 MANUFACTURERS:

- A. General Casework: Products and catalog numbers are from Advanced Cabinet Systems (ACS) and are used as basis for identification, configuration, size, and quality.
- B. The casework shall conform to configuration, arrangement, design, material quality, joinery, panel thickness, and surfacing of that specified and shown on drawings. The following manufacturers are approved provided product is bid per specifications:
 - 1. Advanced Cabinet Systems (ACS)
 - 2. Stevens CaseMaster Series
 - 3. Habersham
 - 4. M&N Millwork

1.6 SUBMITTALS

- A. Shop drawings shall be submitted for approval within thirty (30) days after formal notification of award of contract. Drawings shall consist of floor plans indicating arrangement and relation to adjacent work and equipment, and complete elevations of casework. Centerline of service requirements shall be noted for use by other trades. A schedule of all sinks, fittings, and accessories that are part of this contract shall be provided.
- B. Color samples shall be submitted for selection and coordination at time of contract award. Samples of actual material and color shall be available as required.
- C. Additional catalog cuts, details and samples as requested by architect for evaluation and coordination.

1.7 PRODUCT DELIVERY AND STORAGE

- A. Protect cabinet and countertops during transit, delivery, storage and handling to prevent damage, soiling and deterioration.
- B. Store cabinets and countertops at project site installation and storage areas with similar ambient conditions as final installation. Storage areas must be kept dry, heated with low relative humidity and away from construction work such as painting, wet work, grinding and similar operations.

1.8 WARRANTY

- A. Casework manufacturer shall warrant for a period of three (3) years, the product manufactured by it to be free from defects in material and workmanship when properly installed under normal use.
- B. Accessory equipment (sinks, fittings, etc.), if required, shall be warranted by appropriate manufacturer's guarantee.

PART 2 PRODUCTS

2.1 CORE MATERIAL

- A. Cabinet components having particle board core material shall be of a minimum 45 lb. density, M-2 industrial grade. The particleboard used shall have been tested under ANSI A208.1 1993 standards and / or ASTM D 1037-91A.
- B. Medium density fiberboard (MDF) shall be used in high stress areas as drawer members and shall be minimum 48 lb. density MD-21 grade and tested under ANSI A208.2 1994 Standards

- C. Industrial hardboard shall be pre-finished 1/4" thickness composed of wood fibers, phenolic resin binders and moisture inhibitors that meet or exceed the hardboard product standard ANSI/AHA A135.4 1988.

2.2 SURFACE MATERIAL

- A. Exposed exteriors shall be:
High pressure decorative plastic laminate thermoset to core using catalyzed PVA glue with a minimum average pressure of 90 PSI and average 180 degree F. temperature. High pressure decorative plastic laminate shall meet NEMALD 3-1995, VGS.028 specification standards.
- B. Exposed doors and drawer fronts shall be:
High pressure decorative plastic laminate thermoset to core using catalyzed PVA glue with a minimum average pressure of 90 PSI and average 180 degree F. temperature. High pressure decorative plastic laminate shall meet NEMALD 3-1995, VGS.028 specification standards.
- C. Exposed interiors shall be:
Permanently thermofused melamine laminate, fused to core using a minimum average pressure of 320 PSI and average 320 degree F. temperature. Thermofused melamine laminate shall meet ALA 1996 specification standards, as tested against the high pressure laminate NEMA LD 3-1995, VGS.028 specification standards. (Warranted for life against declamations.)
- D. Semi-exposed and concealed surfaces shall be permanently thermofused melamine laminate or high pressure decorative plastic laminate cabinet liner, 0.020" thickness for balanced construction. Thermofused melamine laminate shall meet the ALA 1996 specifications standards, as tested against the high pressure laminate NEMA LD 3-1995, VGS.028 specification standards.

2.3 EDGINGS

- A. Exposed exterior cabinet front edges shall be banded with a contrasting or matching rigid PVC extrusion, 0.018" in thickness, resistant to chip, crack and high impact. Edging shall have a satin finish with a UV cured top coat for additional durability. The 0.018" thick edging shall be applied with waterproof hot melt adhesive.
- B. Door and drawer front edges shall be:
Banded with a contrasting or matching rigid PVC extrusion, 3mm (1/8") thickness, resistant to chip, crack, and high impact. Edging shall have a satin finish with UV cured top coat for additional durability. The 3mm thick edging shall be applied with waterproof hot melt adhesive, and shaped to provide radiused edges and radiused corners.
- C. Adjustable shelves shall be banded with PVC extrusion, resistant to chip, crack, and high impact. Edging shall have a satin finish with a UV cured top coat for additional durability. Edging shall be applied with waterproof hot melt adhesive. 0.018" thick PVC edging shall be applied to front edge of adjustable shelf.
- D. All other interior components, including drawers, shall be banded with a PVC extrusion, 0.018" in thickness, resistant to chip, crack, and high impact. Edging shall have a satin finish with a UV cured top coat for additional durability. Edging to be machine applied with waterproof hot melt adhesive.

2.4 COLOR SELECTIONS

- A. Exposed cabinet exteriors shall be chosen from:

Wilsonart, (Design Group One), Formica, or Pionite color groups in high pressure decorative plastic laminate.

- B. Exposed doors and drawer fronts shall be chosen from:
Wilsonart, Formica, or Pionite color groups in high pressure decorative plastic laminate.
- C. Semi-exposed surfaces, including drawer box components, shall be finished in either pearl or grey as selected from casework manufacturer's standard interior color selections.
- D. Exposed interior components, including both faces of shelves and interior face of backs to be pearl or grey.
- E. Door and drawer front edges shall be chosen from one of twenty-two (22) trim group colors in 3mm thick PVC in contrasting or matching colors as depicted in manufacturer's color guide.
- F. Exposed front edge of cabinet, including exposed interior edges, shall be selected from one of seventy (70) trim group colors in 0.018" thick PVC in contrasting or matching colors as depicted in manufacturer's color guide, or commercial match to selected exposed exterior color based on availability.
- G. Semi-exposed edges of cabinet components including drawers, shall be either pearl or grey in 0.018" thick PVC.
- H. Five knuckle hinges shall be available with black, pearl or chrome epoxy finish.
- I. Pulls shall be available in chrome, brass, bent wire and injection molded pulls in either bent wire or contour design, to be available in twenty (20) colors as selected from manufacturer's color selector.
- J. Casework of substitute brands with lesser amounts or more restrictive selection requirements will not be considered equal and shall be rejected.
- K. Finishes to be laminate manufacture's matte, suede, or equivalent finish as approved by architect. Samples will be reviewed by architect for color, texture, and pattern only.

2.5 HARDWARE

- A. Hinges shall be:
Heavy duty five knuckle style, with interlaying leaves capable of 270 degree swing. Hinge shall be constructed of 0.090" minimum thickness steel with black, pearl or chrome epoxy finish, hospital tipped with non-removable pin. Doors less than 48" in height shall have two (2) hinges per door. Doors exceeding 48" in height shall have three (3) hinges per door.
- B. Door catches shall be a heavy-duty spring loaded, large diameter (17.5mm - 11/16") roller type catch mounted at bottom edge. All doors over 48" in height shall be provided with roller catch at both top and bottom of door.
- C. Catch strike plate shall be injection molded ABS, with an integrally molded engagement ridge. Strike plate shall also provide a wide face bumper insuring a positive door stop.
- D. Pulls shall be impact resistant injection molded nylon bent wire, 4" length available per color selection in article 2.04.I.
- E. Drawer and slide out shelves shall be suspended with bottom mount, side and bottom attached nylon roller epoxy coated steel slides to ensure quiet, smooth operation. Lateral stability is achieved thru a special formed captive profile. Slides shall have 100 lb. load rating, with both in and out drawer stop, 3" self close feature and a side adjustment cam allowing 3mm side to side alignment.

- F. Drawers specifically noted for full extension file use shall be suspended with bottom mount, side and bottom attached nylon roller epoxy coated steel slides to ensure quiet, smooth operation. Lateral stability is achieved thru a special formed captive profile. Slides shall have 150 lb. load rating, with both in and out drawer stop, and 3" self close feature. File drawer shall include extruded top mounted molded side rails to accept standard hanging file folders.
- G. Knee-space, pencil drawers, and keyboard trays, shall be designed to permit under counter or support frame mounting, with 100 lb. nylon roller epoxy coated steel slides.
- H. Hanger rods shall be heavy chrome plated tubing. Rod shall be securely affixed to cabinet shelves.
- I. Tote trays shall be of high impact polystyrene with smooth edges. Each tray to include an identification card holder and shall be suspended from rails securely attached to cabinet verticals.
- J. Shelf support clips for (3/4" thick if less than 36" long, 1" thick if 36" long or above) adjustable shelves shall be injection molded clear polycarbonate. Support clips shall incorporate integral molded lock tabs to retain shelf from tipping or inadvertently being lifted out. Support clip shall have 5mm dia. double pin engagement into precision bored hole pattern in cabinet vertical members. Clips shall have a molded ridge which provide pressure against edge of shelving to maintain positive pin engagement. Clip shall be designed in such a manner to provide means for permanent retention to shelf. Static test load must exceed 200 lb. per clip.
- K. Dividers that are 1/4" thick shall be fully adjustable and retained with injection molded clear polycarbonate clip.
- L. Locks shall be Best Core IC Locks to receive the Owner's Best Core.
- M. Sliding door track shall be double channel rigid PVC extrusion at both top and bottom of doors. Track shall be available in pearl, black or grey colors.
- N. Teacher wardrobe mirrors shall be 7/32" (6mm) thick polished plate mirror.

2.6 COMPONENTS

- A. Base, Wall and Tall cabinet ends shall be 3/4" thick particle board, laminated for balanced construction, surfaced as described in article 2.02.A and edged as described in article 2.03.A.
- B. Base and Tall cabinet tops and bottoms shall be 3/4" thick particle board, laminated for balanced construction, surfaced as described in article 2.02.C, and edged as described in article 2.03.A.
- C. Wall cabinet top and bottom shall be 3/4" thick particle board, laminated for balanced construction, surfaced as described in article 2.02.C, and edged as described in article 2.03.A.
- D. Vertical cabinet members shall be 3/4" thick particle board, laminated for balanced construction, surfaced as described in article 2.02.C, and edged as described in article 2.03.D.
- E. Cabinet backs shall be 1/2" thick inset with 3/4" thick hanging strips of pre-finished industrial hardboard.
- F. Frame rails shall be 3/4" thick x 3 3/4" wide particle board, laminated for balanced construction, surfaced, as described in article 2.02.C, and edged as described in article 2.03.A.
- G. Sub base shall consist of:

Two (2) toe kick support rails shall be 3/4" thick x 3 3/4" high particle board and be inset from cabinet front and back edge, to give additional load support.

- H. Mounting rails shall be 3/4" thick x 3 3/4" wide particle board. Wall cabinets shall have rails positioned at the top and bottom. Tall cabinets shall have rails positioned at the top and intermediate location. Base cabinet shall have rails positioned at the top of unit.
- I. Drawers shall be full box design with a separate front. Drawer sides and ends shall be constructed of 5/8" medium density fiberboard with pearl or grey color thermofused melamine laminate and matching PVC top edges. Bottoms shall be 1/4" thick medium density fiberboard, pearl or grey color thermofused melamine laminate.
- J. Adjustable shelves shall be 3/4" thick if less than 36" long, 1" thick if 36" long or above. Edges of shelf shall be banded as described in article 2.03.C with a high impact, rigid PVC extrusion, pearl or grey in color.
- K. Sliding display doors shall be constructed of 1/4" thick distortion free glazing sheet. Center edge shall be capped with full length aluminum channel. Aluminum channel shall be custom extruded, clear etched and anodized. Full length extruded aluminum channel shall be used on outer edges.
- L. Solid hinged doors, sliding doors and drawer fronts shall be 3/4" thick material of balanced construction, surfaced as described in section 2.02.B, edged as described in article 2.03.B

2.7 CONSTRUCTION

- A. Cabinet parts shall be accurately machined and precision bored for premium grade quality joinery construction, utilizing automatic machinery to ensure consistent sizing on modular cabinets. Cabinets shall be assembled under controlled case clamp conditions, assuring final cabinet squareness and proper joint compressions.
- B. Cabinet ends shall be bored to receive 8mm, industrial grade hardwood laterally fluted dowels with chamfered ends. Cabinet ends shall be prepared to receive adjustable shelf hardware at 32mm (approximately 1 1/4") centers. Door hinges and drawer slides shall be machined drilled to maintain vertical and horizontal alignment of components. Inset grooving with chamfer shall be machined 3/4" from rear edge to accept the 1/4" back. Base and Tall units shall have one piece end panels continuous to floor for added load capabilities.
- C. Tops and bottoms shall be joined to cabinet ends using a minimum of six (6) dowels at each joint for twenty-four (24) inch deep cabinets and a minimum of four (4) dowels at each joint, for twelve (12) inch deep cabinets. All dowels to be industrial grade hardwood, laterally fluted, with chamfered ends and 8mm in diameter. Top of base cabinet will be full depth. Inset grooving with chamfer shall be machined 3/4" from rear edge to accept the 1/4" back.
- D. Vertical dividers shall be bored to receive adjustable shelf hardware at 32mm (approximately 1 1/4") centers. Dividers shall be joined to tops and bottoms with 8mm diameter hardwood dowels.
- E. Frame rails shall be joined to ends with 8mm diameter hardwood dowels.
- F. Two (2) toe kick supports shall be inset from cabinet front and back edges, and doweled into cabinet ends with 8mm hardwood dowels.
- G. Mounting rails shall be fully concealed behind backs. Rails shall be 3/4" thick and fastened to cabinet ends with 8mm hardwood dowels. Wall and tall cabinet shall incorporate two mounting rails. Wall cabinets shall have rails positioned at top and bottom. Tall cabinets shall have rails positioned at top and intermediate location. Base units shall have rail positioned in the upper back area.

- H. Back panels shall be 1/2" thick and inset 3/4" from rear edge of cabinet. Back shall be glued and continuously trapped in top, bottom, and ends of cabinets.
- I. Drawer corner joints shall be interlocking dowel pin design. Hardwood dowel pins, 8mm diameter shall be inserted into drawer fronts and backs to fit into machined hole patterns in drawer sides. Bottoms shall be trapped into grooves on all four sides glued and mechanical fastened. Drawers shall be suspended on slides as described in article 2.05.E.

2.8 WORK SURFACES

- A. Core material having particle board shall be of a minimum 45 lb. density, M-2 industrial grade. The particleboard used shall have been tested under ANSI A208.1 1993 standards and / or ASTM D 1037-91A.
- B. Surface material shall be:
High pressure decorative plastic laminate thermoset to core using catalyzed PVA glue with a minimum average pressure of 90 PSI and average 180 degree F. temperature. High pressure decorative plastic laminate shall meet NEMALD 3-1995, HGS.048 specification standards.
- C. Color selection shall be:
Wilsonart, Formica, or Pionite color groups in high pressure decorative plastic laminate.
- D. Exposed edges shall be banded with same laminate as work surfaces. The edging shall be applied with waterproof hot melt adhesive.
- E. Underside of all work surfaces to have BK-20 backer or approved equivalent. This balance sheet shall be thermoset to core using catalyzed PVA glue with a minimum average pressure of 90 PSI and average 180 degree F. temperature.
- F. Design and construction of work surfaces shall be...
30mm (1-3/16") thick with 90 degree (90 degree roll-edge standard) postformed radius HGP.039 laminate at front edge. Laminate countertops shall have wafers for alignment and tight-joint fasteners at all joints. Top edge of integral backsplashes to have 90 degree postformed radius profile on upper edge. Where countertops abut wall, separate end splashes are to be provided.
- G. All outside corners to have 1" radius on all countertops.
- H. Solid-Surfacing Material: Homogeneous solid sheets of filled plastic resin complying with ISSFA-2.

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

Corian
LG Chemical, Ltd.
Wilsonart International; Div. of Premark International, Inc.

Type:

Colors and Patterns: As selected by Architect from manufacturer's full range

PART 3 EXECUTION

3.1 INSTALLATION

- A. The installer must examine the job site and the conditions under which the work in this section is to be performed, and notify the contractor in writing of any unsatisfactory conditions. Do not proceed with work under this section until unsatisfactory conditions have been corrected in a manner acceptable to the installer.
- B. Casework, countertops, and related materials to be conditioned to average prevailing humidity condition in installation areas prior to start of work.
- C. Install casework and countertops with factory-trained supervision authorized by manufacturer. Casework shall be installed plumb, level, true and straight with no distortions. (Shim as required.) Securely attached to building structure with anchorage devices of appropriate type, size and quantity to meet applicable codes, specifications and safety conditions. Where laminate clad casework and countertops abuts other finished work, scribe and trim to accurate fit.
- D. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by the manufacturer.
- E. Repair, or remove and replace, defective work as directed upon completion of installation.
- F. Clean plastic surfaces, repair minor damage per plastic laminate manufacturer's recommendations. Replace other damaged parts of units.
- G. Advise contractor of procedures and precautions for protection of casework and countertops from damage by other trades until acceptance of work by owner.
- H. Cover casework with 4-mil polyethylene film for protection against soiling and deterioration during remainder of construction period.

END OF SECTION - 12304

SECTION 14240 – Hydraulic Elevators

PART 1 - GENERAL

1.01 Summary

- A. This section specifies hydraulic elevators.
- B. Work Required
 - 1- The work required under this section consists of all labor, materials and services required for the complete installation (including operational verification) of all the equipment required for the elevator(s) as herein specified in compliance with all State Building Codes.
 - 2- All work shall be performed in a first class, safe and workmanlike manner.
 - 3- In all cases where a device or part of the equipment is herein referred to in the singular, it is intended that such reference shall apply to as many of such devices or parts as are required to make complete installation.

1.02 Related Sections

- A. The following sections contain requirements that relate to this section and are performed by trades other than the elevator manufacturer/installer.
 - 1- Temporary Facilities and Controls: protection of floor openings and personnel barriers; temporary power and lighting.
 - 2- Cast-In-Place Concrete: elevator pit, elevator motor and pump foundation, and grouting thresholds.
 - 3- Unit Masonry: masonry hoistway enclosure, building-in and grouting hoistway doorframes, and grouting of sills.
 - 4- Metal Fabrications: pit ladder, divider beams, supports for entrances and rails, and hoisting beam at top of elevator hoistway.
 - 5- Cementitious Waterproofing: waterproofing of elevator pit.
 - 6- Heat Generation Equipment: ventilation and temperature control of elevator equipment areas.
 - 7- Common Work Results for Electrical:
 - a. Main disconnects for each elevator.
 - b. Electrical power for elevator installation and testing.
 - c. Disconnecting device to elevator equipment prior to activation of sprinkler system.
 - d. The installation of dedicated GFCI receptacles in the pit and overhead.
 - e. Lighting in controller area, machine area and pit.
 - f. Wiring for telephone service to controller.
 - 8- Emergency (Standby) Power Supply Systems: emergency generator for elevator operation.
 - 9- Voice Communications: ADAAG-required emergency communications equipment.
 - 10- Section 28 31 00 – Fire Alarm Systems: fire and smoke detectors at required locations and interconnecting devices; fire alarm signal lines to contacts in the machine area.

11- Section 31 10 00 – Site Clearing: excavation for cylinder well casing.

1.03 References

- A. Comply with applicable building and elevator codes at the project site, including but not limited to the following:
 - 1- ASME A17.1/CSA B44, Safety Code for Elevators and Escalators.
 - 2- ASME A17.7/CSA B44, Performance-Based Safety Code for Elevators and Escalators.
 - 3- ADAAG, American Disabilities Act Accessibility Guidelines.
 - 4- ANSI A117.1, Building and Facilities, Providing Accessibility and Usability for Physically Handicapped People.
 - 5- ANSI/NFPA 70, (NEC) National Electrical Code.
 - 6- CAN/CSA C22.1, (CEC) Canadian Electrical Code.
 - 7- ANSI/UL 10B, Standard for Fire Test of Door Assemblies.
 - 8- CAN/ULC-S104-10, Standard Method for Fire Test of Door Assemblies.
 - 9- ANSI/NFPA 80, Standard for Fire Doors and Other Opening Protectives.
 - 10- Building Codes IBC or NBCC.
 - 11- All Local and State Jurisdictional applicable codes.

1.04 System Description

- A- Equipment Description: Hole-less Hydraulic elevator with machine-room less application
- B- Equipment Control: Elevonic® Control System.
- C. Quantity of Elevators: 1
- D. Elevator Stop Designations: 1, 2
- E. Stops: 2
- F. Openings: Front Only
- G. Travel: 14'-0". Verify prior to approval.
- H. Rated Capacity: 2500
- I. Rated Speed: 100 fpm
- J. Platform Size: 6'-6 3/4" W x 5'-6 1/8" D
- K. Clear Inside Dimensions: 6' 5 9/16" x 4' 3 9/16"
- L. Cab Height: 93"
- M. Clear Cab Height: 7'-4 5/16" (2243 mm)
- N. Entrance Type and Width: Single Slide - 3'6"
- O. Entrance Height: 84"
- P. Main Power Supply: 208 volts 5% of normal, three-phase, with a separate equipment grounding conductor.
- Q. Car Lighting Power Supply: 120 volts, single-phase, 15 amps, 60 Hz.
- R. Machine Location: No machine-room required, tank and controller in hoistway pit. Shaft access on second floor.

- S. Signal Fixtures: Manufacturer's standard with metal button targets (excluding CA).
- T. Controller Location: In a machine space or closet
- U. Operation :**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.
- V. Operation Features – Standard
 - 1- Full Collective Operation
 - 2- Anti-nuisance.
 - 3- Fan and Light Protection.
 - 4- Load Weighing Bypass.
 - 5- Independent Service.
 - 6- Firefighters' Service Phase I and Phase II (USA only); or Special Emergency Service Phase I and II – Emergency Recall and In-Car Emergency Operation (Canada only).
 - 7- Top of Car Inspection.
- W. Door Control Features:
 - 1- Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.
 - 2- 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.
 - 3- Door protection shall consist of a two-dimensional, multi-beam array projecting across the car door opening.
 - 4- Door nudging operation to occur if doors are prevented from closing for an adjustable period of time.
- X. Provide equipment for seismic conditions: Yes

1.05 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 hoistway (BTU).
 - 6- Color selection chart for Cab and Entrances.
- 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- Clearances and travel of car.

- 5- Clear inside hoistway and pit dimensions.
- 6- Location and sizes of access doors, hoistway entrances and frames.
- C. Operations and Maintenance Manuals: Provide manufacturer's standard operations and maintenance manual.

1.06 Quality Assurance

- A. Manufacturer: Elevator manufacturer shall be ISO 9001 certified.
- B. Manufacturer shall have a minimum of fifteen years of experience in the fabrication, installation and service of elevators.
- C. Installer: Elevators shall be installed by the manufacturer.
- D. Permits, Inspections and Certificates: The Elevator Contractor shall obtain and pay for necessary Municipal or State Inspection and permit as required by the elevator inspection authority, and make such tests as are called for by the regulations of such authorities. These tests shall be made in the presence of such authorities or their authorized representatives.

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 General Contractor will be responsible to provide a proper and suitable storage area on or off the premises.
- B. Should the storage area be off-site, and the equipment not yet delivered, then the elevator contractor, upon notification from the General Contractor, will divert the elevator equipment to the storage area. If the equipment has already been delivered to the site, then the General Contractor 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 Warranty

- A. The elevator contractor's acceptance is conditional on the understanding that their warranty covers defective material and workmanship. The warranty period shall not extend longer than one (1) year from the date of completion or acceptance thereof by beneficial use, whichever is earlier, of each elevator. The warranty excludes: ordinary wear and tear, improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the elevator contractor and this express warranty is in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.

1.09 Maintenance and Service

- A. Maintenance service consisting of regular examinations and adjustments of the elevator equipment shall be provided by the elevator contractor for a period of 24 Months after the elevator has been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the elevator contractor. All work shall be performed by competent employees during regular working hours of regular working days. This service shall not cover adjustments, repairs, or replacement of parts due to negligence, misuse, abuse or accidents caused by persons other than the elevator contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.
- B. The elevator control system must:
 - 1- Provide in the controller the necessary devices to run the elevator on inspection operation.

- 2- Provide on top of the car the necessary devices to run the elevator in inspection operation.

PART 2 - PRODUCTS

2.01 Manufacturer

- A. Manufacturer: Design based upon Otis HydroFit™ machine room-less elevator system.

2.02 Design and Specifications

- A- Provide hydraulic elevators from Otis Elevator Company. The control system and car design based on materials and systems manufactured by Otis Elevator Company. Specifically, the system shall consist of the following components:
 - 1- The entire hydraulic system and the controller shall be located inside the hoistway. No extra machine room or control closet space is required.
 - 2- LED lighting standard in ceiling lights and elevator fixtures.
 - 3- Sleep mode operation for LED ceiling lights and car fan.
- B. Approved Installer: Otis Elevator Company

2.03 Equipment: Machine Components

- 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 low-pressure switch and a shut-off valve.
- B. The entire hydraulic system with hydraulic-fluid storage tank, power component and valves shall be located in the hoistway pit and be easily accessible for maintenance through an access door in the hoistway wall.
- C. 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 (3) phase overload device shall be provided to protect the motor against overloading.
- D. The controller shall be located together with the hydraulic system in the hoistway pit and be easily accessible for maintenance through the same access door that is also used for the hydraulic system.
- E. A manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.
- F. Pressure Switch
- G. Tank Heater- As recommended by manufacturer.
- H. Low-oil control (where required)

2.04 Equipment: Hoistway Components

- A. Plunger(s) and Cylinder(s): 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. Polyurethane type buffers shall be used.
 - 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. Hoistway 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 of UL fire rated steel.
 - 2- Sills shall be extruded: Aluminum
 - 3- Doors: Entrance doors shall be of metal construction with vertical channel reinforcements.
 - 4- Fire Rating: Entrance and doors shall be UL fire rated for 1-1/2 hour
 - 5- Entrance Finish: Satin Stainless Steel
 - 6- Entrance Marking Plates: Entrance jambs shall be marked with 4" x 4" (102 mm x 102 mm) plates having raised floor markings with Braille located adjacent to the floor marking. Marking plates shall be provided on both sides of the entrance.
 - 7- Sight Guards: Sight guards will be furnished with all doors painted to match with painted doors, painted black for stainless steel doors.

2.05 Equipment: Car Components

- A. Cab: Steel Shell Cab with raised laminate wall panels
- B. Car Front Finish: Brushed Stainless Steel.
- C. Car Door Finish: Brushed Stainless Steel.
- D. Ceiling Type: Dropped ceiling with LED lights
- E. Car Front Finish: Brushed Stainless Steel.
- F. Car Door Finish: Brushed Stainless Steel.
- G. Ceiling Finish: Brushed Steel Finish
- 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 in the event of building power failure.
- I. Fan: A one-speed 120 VAC fan will be mounted to the ceiling to facilitate in-car air circulation, meeting A17.1 code requirements. The fan shall be rubber mounted to prevent the transmission of structural vibration and will include a baffle to diffuse audible noise. A switch shall be provided in the car-operating panel to control the fan.

- J. Handrails: Brushed steel finish, 3/8" x 2" flat tubular bar handrails shall be provided on the side walls.
- K. Threshold: Aluminum
- L. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.
- M. The LED ceiling lights, and the fan should automatically shut off when the system is not in use and be powered back up after a passenger calls the elevator and pushes a hall button.
- N. Certificate frame: Provide a Certificate frame with a Brushed Stainless Steel finish.
- O. Otis cab air purifier

2.06 Equipment: Signal Devices and Fixtures

- 1- The car operating panel shall be equipped with the following features:
 - a. Raised markings and Braille to the left-hand side of each push-button.
 - b. Car Position Indicator at the top of and integral to the car operating panel.
 - c. Door open and door close buttons.
 - d. Inspection key-switch.
 - e. Elevator Data Plate marked with elevator capacity and car number.
 - f. 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.
 - g. 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.
 - h. In car stop switch (toggle or key unless local code prohibits use)
 - i. Firefighter's hat (standard USA)
 - j. Firefighter's Phase II Key-switch (standard USA)
 - k. Call Cancel Button (standard USA)
- B. Car Position Indicator: A digital, LED car position indicator shall be integral to the car operating panel.
- C. Hall Fixtures: Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation.
 - 1- Integral Hall fixtures shall feature round stainless steel, mechanical buttons marked to correspond to the landings. Hall fixtures to be located in the entrance frame face. Buttons shall be in vertically mounted fixture. Fixture shall be Brushed Stainless Steel finish.
 - 2- Button: Flat flush mounted, Brushed Stainless Steel button with blue or white LED illuminating halo
 - 3- 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.
- D. Access key-switch at top floor in entrance jamb.
- E. Access key-switch at lowest floor in entrance jamb.

PART 3 - EXECUTION

3.01 Preparation

- A. Take field dimensions and 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.