THE PROJECT MANUAL FOR

Music Pavilion

City of Starke, Florida

Bradford County, FL
538 East Street
Starke, Florida 32091

February 20, 2025

PAUL STRESING ASSOCIATES, INC.

14617 Main Street
Alachua, Florida32615
Telephone (386) 462-6407
E-Mail: psa@paulstresingassociates.com
CA #AA0003377
PSA 24-845

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SECTION 00010 - NOTICE TO BIDDERS

Bids will be received by the City of Starke, Purchasing Department, 209 N. Thompson Street, Starke, FL 32091, until **12:00 pm, Thursday, April 3, 2025,** at which time and place all bids received will be publicly opened and read aloud in the Commission Board Room for furnishing all labor and materials for the construction of:

CITY OF STARKE DOWNTOWN MUSIC PAVILION ENHANCEMENT
STARKE, FLORIDA

All work shall be done according to the plans and specifications prepared by Architect:

Paul Stresing Associates, Inc.
14617 Main Street
Alachua, Florida 32615
Telephone (386) 462-6407

Plans are on file and open to inspection on the City of Starke website and at the office of the Architect (address shown above). Documents are also on file at the office of Stephanie Mann, Director of Administrative Operations, City of Starke, Office: 904-977-9155.

General Contractors may obtain Drawings and Specifications from the City of Starke website.

Any/all questions are to be submitted in writing to Paul Stresing Associates, Inc., Attention Paul Stresing at E-mail address: PSA@PaulStresingAssociates.com

General Contractors who choose to submit a bona fide bid acknowledge that they have provided a complete scope of work submission and that they have vetted all subcontractors under their scope of work.

The Owner reserves the right to waive any irregularities and minor technicalities or to reject any/all bids.

Each bidder must deposit, with his bid, a Bid Bond or Cashier's Check in the amount of five percent (5%) of the Base Bid price, payable to the Owner.

No bidder may withdraw his bid within ninety (90) days after the actual date of the opening thereof.

All bidders will be notified of the award of the Contract to the successful bidder, or of the rejection of all bids, within fifteen (15) days of the Owner’s decision.

Any actual or prospective bidder who disputes the reasonableness or competitiveness of the terms and conditions of the Invitation To Bid, Contract Award, or Recommendation for Contract Award, shall file a Notice of Protest with a protest bond in the amount of the bid with the Chief Administrative Officer within 72 hours of receipt of the bid solicitation, posting of the bid tabulations, or posting of the bid award and must file a formal written protest within ten (10) days following the filing of the Notice to Protest. Failure to observe such timelines will constitute a waiver of proceedings and of right to protest as stipulated in Chapter 120 of the Florida Statutes.

Bid Tabulations shall be posted at City Hall after the intended recommendation is announced on or about four (4) days of the bid opening and after the Board's decision is made. The Bid Tabulation will remain posted for a minimum period of 96 hours.

(END OF SECTION 00010)

SECTION 00100 - INSTRUCTIONS TO BIDDERS

SECTION INDEX

SECTION 00100 - INSTRUCTIONS TO BIDDERS

1.0 SPECIFICATION TERMINOLOGY

1.01 Bidder is required to obtain a copy of the Owners Contractual Agreement.

1.02 Definition of Terms: Whenever in the Specifications the following terms or pronouns in place of them are used their intent and meaning shall be interpreted as follows:

A. Owner: City of Starke.
B. Architect/Engineer: Acting directly or through a duly authorized representative.
C. Inspector: An authorized representative of the Architect/Engineer or Owner assigned to inspect any of the materials, workmanship, or completed work entering into the work.
D. Bidder: Any individual, firm, partnership, or corporation submitting a proposal for the work contemplated.
E. Surety: The corporate body, which is bound with and for the Contractor, which is primarily liable, and which guarantees the faithful performance of the Agreement.
F. Proposals: The approved forms on which the Bidder will submit his bid for the work contemplated.
G. Drawings: The authorized plans and other drawings or reproductions thereof pertaining to the work to be done.
H. Project Manual: The Conditions of the Contract, Detailed Technical Specifications and such other descriptions of the work as are set forth in any of the Contract Documents.
I. Agreement: "Agreement" shall mean the document entitled "Form of Agreement Between Contractor and Owner for Construction of Buildings", including all Addenda issued prior to execution of Agreement and all modifications issued subsequent thereto.
J. Contract: "Contract" shall mean the Contract Documents as defined and listed in the Agreement.
K. Maintenance Project: Work efforts required to preserve the quality and condition of an existing condition work is to be in like as reasonably close as possible, new technology and product selection modifications can be used if energy savings and code requirement promote their use.
L. Accessibility Enhancements: Improvements to existing conditions to enhance handicap accessibility.
M. Design Team:

Architect	**Electrical Engineer**
Paul Stresing Associates, Inc.	KPI Engineering, LLC.
14617 Main Street, Alachua, FL 32615	3203 Queen Palm Dr., Tampa, FL 33619
(386) 462-6407	(813) 241-6488

N. Civil Engineer under separate cover outside of PSA Scope-of-Work

2.0 FAMILIARITY WITH LAWS

2.01 The Bidder is required to be familiar with all Federal, State and local laws, ordinances, rules, CODES, and regulations that in any manner affect the work. Unfamiliarity or misinterpretation on the part of the Bidder will in no way relieve him from applicable responsibilities. Each Contractor/Subcontractor, Material Vendor, and Applicator is expected to be trained and experienced in the field of their expertise, and neglecting to comply with codes and special requirements unique to their discipline does not relieve them or the Contractor from providing it as if it were shown or called for.

SECTION 00100 - INSTRUCTIONS TO BIDDERS

3.0 PROGRESS PAYMENTS

3.01 Based upon Applications for Payment submitted to the Architect/Engineer by the Contractor and Certificates for Payment issued by the Architect/Engineer, the Owner shall make progress payments to the Contractor as provided in the Agreement. No payment will be allowed for any material or equipment stored off the project site.

4.0 BIDDING DOCUMENTS

4.01 All of the descriptions of the work as well as of the instruments of procedure which are contained in and embraced by the Drawings and Specifications and including Addenda not contained therein comprise the Bidding Documents.

5.0 ALTERNATES

5.01 If the Owner wishes to learn the relative or additional construction cost of an alternative method of construction, an alternative use of type of material, or an increase or decrease in scope of the project, these items will be defined as Alternates and will be specifically described by the Drawings and/or Specifications. Alternates will be listed in the Proposal Form in such a manner that the Bidder shall be able to clearly indicate what sums he will add to his Base Bid.

5.02 Such alternates may or may not be accepted. The alternate will be accepted or rejected solely by the decision of the assigned representative of the City of Starke. The Bidder shall add to his base bid dollar amounts for each of the items listed in the Bid Proposal Form, including any Alternates.

6.0 ADDENDA

6.01 In case the Architect/Engineer finds it expedient to supplement, modify or interpret any portion of the Bidding Documents during the bidding period, such procedure will be accomplished by the issuance of written Addenda to the Bidding Documents which will be delivered or mailed to all prospective Bidders at the respective addresses furnished for such purposes.

7.0 INTERPRETATION OF BIDDING DOCUMENTS

7.01 No interpretation of the meaning of the Drawings, Specifications, or other Bidding Documents, no correction of any apparent ambiguity, inconsistency, or error therein will be made to any Bidder orally. Every request for such interpretation or correction should be in writing, addressed to the Architect/Engineer. All such interpretation and supplemental instructions will be in the form of written Addenda to the Bidding Documents.

7.02 Only the interpretation or correction given by the Architect/Engineer, in writing, shall be binding and prospective Bidders are advised that no other source is authorized to give information concerning or to explain or interpret the Bidding Documents.

7.03 The Intent of the Drawings and Specifications: The Contractor shall complete all work as provided for in Contract Documents including Drawings and Specifications. Anything mentioned or implied in Specifications and not shown on Drawings or shown or implied on

the Drawings and not mentioned in the Specifications, shall be furnished and installed as if shown and mentioned in both to ensure a complete installation of the implied scope of work, in full compliance with the governing codes. The Contractor shall furnish all materials, incidentals, and/or labor required to complete work shown or implied on the Drawings (as in a typical Building Section, door hardware, schedule, service tie-ins, etc.) and called out in the Specifications, to include labor and material requirements reasonably inferable therefrom as being necessary to complete the work whether or not each and every single item necessary to completion is specified or detailed.

7.04 Contractor Responsible for Work Required: The organization of the Specifications into Divisions, Sections, and Paragraphs and the arrangement of the Drawings are not intended to control the Contractor in dividing the work among Subcontractors or to establish the limits and extent of work to be performed by a particular trade. The Contractor alone is responsible for the completion of the entire work as drawn, specified, implied or shown in typical elevations, details, etc. implying other walls not shown to be treated the same, install as if it were detailed, completed in place and in functional or operating conditions. The division of the Specifications into Sections and Paragraphs is for convenience only and not for the purpose of limiting or restricting the performance of any portion of the work to any particular trade. Material vendors and approved subcontractors for each product and its assembly are expected to be experts in their field of training and knowledgeable in the installation of the products being installed and are expected to install their scope of work and all interfacing with adjoining systems with all necessary miscellaneous incidentals whether specified or identified or not; system means a complete code compliant and operational installation.

7.05 Measurements: Before ordering materials or doing any work, the Contractor shall in all cases verify measurements at the site or premises and check same against Drawings. No extra charge or compensation will be allowed on account of differences between actual dimensions and measurements shown on Drawings. Any differences found shall be submitted to the Architect for resolution before proceeding with the work.

7.06 If additional drawing, engineering, or investigative work is requested by the Architect or Engineers to entertain a modification or alteration to accommodate an alternate system, any and all costs associated with the request shall be the responsibility of the Contractor and their Subcontractors.

8.0 EXAMINATION OF BIDDING DOCUMENTS AND SITE WORK

8.01 Bidders are required, before submitting their proposals, to visit the site of the proposed work and completely familiarize themselves with the nature and extent of the work and any local conditions that may in any manner affect the work to be performed and the equipment, materials, and labor required. They are also required to examine carefully the Drawings, Specifications, and other Bidding Documents to inform themselves thoroughly regarding any and all conditions and requirements that may in any manner affect the work.

9.0 LISTING AND APPROVAL OF SUBCONTRACTORS

9.01 In order that the Owner may be assured that only qualified and competent subcontractors in a hard bid project delivery will be employed on the project, each Bidder shall submit with his Proposal a list of the subcontractors who will perform the work in these Specifications as

indicated by the "List of Subcontractors" form contained in these Specifications. The Bidder shall have determined to his own complete satisfaction that a listed subcontractor has been successfully engaged in this particular type of business for a reasonable length of time, has successfully completed installations comparable to that which is required by this Agreement and is qualified both technically and financially to perform that pertinent phase of this work for which he is listed. Each Subcontractor shall be currently certified and licensed to perform that phase of the work for which he is listed. Only one subcontractor shall be listed for each phase of the work. Electrical and General Contractors shall be State Certified and present a copy of the license upon the request of the Owner within 48 hours of bid opening. The Owner/Architect has the right to accept or reject the name of any subcontractor listed if they deem it is in their best interest.

9.02 After public opening and reading of Proposals, the Listing of Subcontractors submitted by the apparent competitive low Bidders will be read publicly. The listings or the next two low bids will be held for 30 days. The listings of the other Bidders will be returned.

9.03 No change shall be made in the list of subcontractors before or after the award of a contract, unless agreed to in writing by the Owner.

10.0 TIME OF COMPLETION AND LIQUIDATED DAMAGES

10.01 The work to be performed under this contract shall be dictated by the executed Owner/Contractor contract.

A. Owner requires a final completion on or before the date established the Owner provided agreement for this particular project scope of work being contracted.

B. Project is to be Substantially complete in one hundred fifty (150) days and Final thirty (30) days after.

10.02 Failure to complete the project within the time fixed above will result in substantial injury to the Owner, and as damages arising from such failure cannot be calculated with any degree of certainty, it is hereby agreed that if the project is not substantially completed, as in accordance with the provisions of the Contract Documents shall be allowed for such substantial completion, the Contractor shall pay to Owner as liquidated damages in the amount of $450 per day for such delay, and not as a penalty, this agreed upon amount for each and every calendar day elapsing between the date fixed for substantial completion above for the first thirty (30) days and $250 per day thereafter until the date such substantial completion shall have been fully accomplished, or as previously negotiated in the Owner contract. The Liquidated Damages described in the Owner's agreement shall be the Owner's sole remedy for Construction Contractor's delay but shall not exclude the recovery of damages by the Owner under other provisions of the Contract Documents. This provision of liquidated damages for delay shall in no manner affect the Owner's right to terminate the contract as provided in the General Conditions or elsewhere in the Contract Documents. The Owner's exercise of the right to terminate shall not release the Contractor from his obligation to pay said liquidated damages in the amounts set out above.

10.03 This provision for liquidated damages for delay shall in no manner affect the Owner's right to terminate the contract as provided in the Owner's agreement. The Owner's exercise of the right to terminate shall not release the Contractor from his obligation to pay said liquidated damages in the amounts set out in the Agreement.

10.04 It is further agreed that the Owner may deduct from the balance retained by the Owner under

the provisions identified the Owner's Agreement as the case may be, or such portion thereof as the said retained balance will cover.

11.0 BASIS FOR BIDDING - TRADE NAMES

11.01 For clarity of description and as a standard of comparison, certain equipment, materials, etc., have been specified by trade names or manufacturers to ensure a uniform basis for bidding. The Bidder shall base his Proposal on the particular system, equipment, or material specified. After the contract is let, other equipment materials, etc., as manufactured by other manufacturers may be accepted only if, in the opinion of the Architect/Engineer, same is equivalent in quality and workmanship and will perform satisfactorily its intended purpose. Refer to section 01100 for request for approval of manufacturer.

12.0 FLORIDA PRODUCTS AND LABOR

12.01 The Contractor's attention is called to Section 255.04, Florida Statutes, which require that on public building contracts Florida products and labor shall be used wherever price and quality are equal.

13.0 TAXES

13.01 Although the Owner is not subject to the Florida Sales and Use Tax, any Contractor who purchases materials which will be used in the construction of state-owned building will not be exempted from the Sales Tax on these materials as evidenced by the following excerpt from the Florida statutes:

> "The State, any county, municipality, or political subdivision of this State is exempt from the sales tax, except this exception shall not include sales of tangible personal property made to contractors employed either directly or as agents of any such government of political subdivision thereof when such tangible personal property goes into or becomes a part of public works owned by such government or political subdivision thereof."

13.02 The Owner is not subject to:

A. Federal Excise Taxes on materials or appliances that are incorporated into and become a part of the completed improvement.
B. Federal Tax on Transportation of Property.

13.03 In every case of a purchase of materials to be incorporated in the work which are subject to Federal Excise Tax, the Owner will furnish to the Contractor the necessary Federal Excise Tax Exemption Certificate upon receipt of a copy of the supplier's invoice showing the item or items, the net price, and Federal Excise Tax separately.

14.04 The Bidder shall take these factors into consideration in preparing his proposal, including therein the cost of the State Sale and Use Tax on materials, but excluding the cost of those taxes not applicable.

SECTION 00100 - INSTRUCTIONS TO BIDDERS

14.0 PERMITS

14.01 The General Contractor is responsible for procurement of all required permits. Unless work efforts are non-structural maintenance related enhancement to protect the structure and accessibility, consult with the building department to discuss maintenance enhancement improvements.

15.0 GOVERNING CODES

15.01 Governing Code: Florida Building Code 2020 (7th Edition)

15.03 State Requirements:

A.	The Standard Florida Building Code	8th Edition
B.	Florida Standard Plumbing Code	8th Edition
C.	Florida Standard Mechanical Code	8th Edition
D.	Florida Standard Gas Code	8th Edition
E.	Florida Fire Prevention Code	8th Edition
F.	NFPA 70, National Electrical Code	2023
G.	NFPA 101 Life Safety Code	2024
H.	NFPA-72 National Fire Alarm & Signaling Code	2022
I.	NFPA-13 Standard Installation for Installation of Sprinkler Systems	2022
J.	NFPA-58-11 Liquified Petroleum Gas Code	2020
K.	ANSI A117.1 (Physically Handicapped)	2017 (or latest edition).
L.	Refer to Section 01060 – Codes, Permits and Fees of this manual	

(END OF SECTION 00100)

SECTION 00200 – PUBLIC ENTITY CRIMES

SWORN STATEMENT UNDER SECTION 287.133(3)(a), FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid, Proposal or Contract No. _____ for _____.

2. This sworn statement is submitted by _____
(Name of entity submitting sworn statement)
whose business address is _____

_____ and

(if applicable) its Federal Employer Identification Number (FEIN) is _____.

(If the entity has not FEIN, include Social Security Number of the individual signing this sworn statement:_____.)

3. My name is _____ and my relationship
(please print name of individual signing)
to the entity named above is _____.

4. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), *Florida Statutes*, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including, but not limited to, any bid or contract for goods or services to be provided to any public entity or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, or material misrepresentation.

5. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), *Florida Statutes*, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication of guilt, in any federal or state trial court of record relating to charges brought by indictment or information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

6. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), *Florida Statutes*, means:

   a. A predecessor or successor of a person convicted of a public entity crime; or

   b. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members and agents who are active in the management of an affiliate. The ownership by one person of shares constituting a controlling interest in another person, or a

SECTION 00200 – PUBLIC ENTITY CRIMES

pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding thirty-six (36) months shall be considered an affiliate.

7. I understand that a "person" as defined in Paragraph 287.133(1)(e), *Florida Statutes*, means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

8. Based on information and belief, the statement that I have marked below is true in relation to the entity submitting this sworn statement.
(Please indicate which statement applies.)

_____ Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989.

_____ Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989, AND
(Please indicate which additional statement applies.)

_____ There has been a proceeding concerning the conviction before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer did not place the person or affiliate on the convicted vendor list. (Please attach a copy of the final order.)

_____ The person or affiliate was placed on the convicted vendor list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearing. The final order entered by the hearing officer determined that it was in the public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order.)

_____ The person or affiliate has not been placed on the convicted vendor list. (Please describe any action taken by or pending with the Department of General Services.)

_____
(Signature)

Date: _____

STATE OF FLORIDA

SECTION 00200 – PUBLIC ENTITY CRIMES

COUNTY OF _____

PERSONALLY APPEARED BEFORE ME, the undersigned authority, _____, who, after being first duly sworn by me, affixed his/her signature in the space provided above on this _____ day of _____, 20___.

_____
NOTARY PUBLIC

My Commission Expires:

SECTION 00300 - BID FORM

BID PROPOSAL FORM

[SUBMIT IN DUPLICATE ON CONTRACTOR'S LETTERHEAD]

DATE: _____

TIME: _____

TO: City of Starke
209 N. Thompson Street
Starke, FL 32091

RE: **DOWNTOWN MUSIC PAVILION ENHANCEMENT**
538 EAST STREET, STARKE, FL 32091
PSA Project No. 24-845

Gentlemen:

The undersigned, hereinafter called "Bidder", having visited the site of the proposed project and familiarized himself with the local conditions, nature and extent of the Work, and having examined carefully the drawings, specifications, the Form of Agreement, and other Contract Documents with the Bond Requirements therein, proposed to furnish all labor, materials, equipment and other items, facilities and services for the proper execution and completion of the referenced construction, in full accordance with the Drawings and Specifications prepared by the firm of **Paul Stresing Associates, Inc.**, in full accordance with the advertisement for bids, Instructions to Bidders, Agreement, and all other documents relating thereto on file in the office of the Architect/Engineer and if awarded the Contract, to complete the said work within the time limits specified for the following bid price:

TRENCH SAFETY (Where Applicable)

Provide price for trench safety for trench excavations in excess of five (5) feet deep in accordance with the Trench Safety Act, Chapters 90-96, Laws of Florida and OSHA Standard 29 C.F.R. s.1926.650 Subpart P.

The Contractor herein verifies that he is aware of the Trench Safety Act and has in his bid all costs related to the requirement of this Act.

_____
Certified by Contractor

SECTION 00300 - BID FORM

A. BASE BID

_____ *Dollars (*$_____)

B. ALTERNATES

1. ADDITIVE ALTERNATE NO. 1
Metal Standing Seam Roof System

_____ Dollars ($_____)

There is enclosed a certified check, cashier's check, treasurer's check, bank draft or Bid Bond in the total amount of **not less than five (5%) percent of the Base Bid and All Alternates** payable to the City of Starke as a guarantee for the purpose set out in your Instructions to Bidders.

The Bidder hereby agrees that:

A. The base bid proposal and alternates shall remain in full force and effect for a period of thirty (30) calendar days after the time of the opening of this proposal and that the Bidder will not revoke or cancel this proposal or withdraw from the competition within the said thirty (30) calendar days.

B. In the event the Contract is awarded to this Bidder, he will enter into a formal written Agreement with the Owner in accordance with the accepted bid within ten (10) calendar days after the board has taken formal action to accept his/her bid and will furnish to the Owner a Contract Performance Bond and Labor and Material Bond with good and sufficient sureties, satisfactory to the Owner, in the amount of 100% of the accepted bid, the form and terms of which shall fully comply with Section 255.05, Florida Statutes. The Bidder further agrees that in the event of the Bidder's default or breach of any of the agreements of this proposal, the said bid deposit shall be forfeited as liquidated damages.

SECTION 00300 - BID FORM

Acknowledgment is hereby made of receipt of the following Addenda issued during the bidding period.

Addendum No.	Dated

Florida Construction Industries Licensing Board of Certification

_____ _____
(Name of Holder) (Certificate No.)

In witness thereof, the Bidder has hereunto set his signature and affixed his seal this day of _____ A.D. 20___.

(Corporate Seal)

By: _____

Print Name and Title: _____

Company Name: _____

Address: _____

_____

Phone Number and Facsimile: _____

(END OF SECTION 00300)

SECTION 00400 – LIST OF SUBCONTRACTORS

1.1 LIST OF SUBCONTRACTORS FORM

LIST OF SUBCONTRACTORS
(To be submitted on the Bidder's letterhead, placed in a sealed envelope and attached to Contractor's proposal).

DATE:_____

This list is an integral part of the bid submitted by: _____

_____
(Bidder to insert his full name and address)

For the Construction of: **CITY OF STARKE DOWNTOWN MUSIC PAVILION ENHANCEMENT STARKE, FL**

The undersigned, hereinafter called "Bidder", lists below the names of the subcontractors who will perform the phases of the work indicated:

	DIVISION OF CONTRACT	NAME/ADDRESS OF SUBCONTRACTOR	APPROVED MANUFACTURER
1.	Roofing Products		
	Pre-Engineered Pavilion Structure		
	Mason		
	Electrical Subcontractor		
	Concrete		

Proof of each Subcontractor's State License shall be provided. The General Contractor shall submit a copy of each Subcontractors' license(s) to Owner **within 48 hours of Bid Opening**.

(END OF SECTION 00400)

SECTION 00810 - PROGRESS PAYMENTS

1.0 GENERAL

1.01 Owner will retain 10% of the amount earned by the Contractor until Final Payment is made.

1.02 Owner will at intervals, make progress payments to the Contractor as provided in the Agreement. Payment will be as follows:

A. Monthly payments for work completed, less 10% retainage.

B. Final Payment of balance due, at final completion of the project, subject to other conditions of the project documents.

1.03 Job will be considered 100% complete after the final inspection and acceptance by the Threshold Inspector, the Authority having Jurisdiction, the Architect/Engineer and Owner and any other inspection required by the Architect/Engineer or State Agencies are complete and all closeout material is submitted, reviewed, and approved by Architect/Engineer.

1.04 Request for payment must be in the Office of the Project Manager fourteen (14) days prior to the day payment is made.

1.05 The City of Starke Board of City Commissioners issues payments on designated days of the month, which will be identified during the pre-construction meeting.

1.06 The Contractor shall request such compensation except for final payment by submitting:

A. A properly completed and notarized Application for Progress Payment (AIA Document G702) using AIA Document G703, 1992 Edition or a mutually agreed schedule, if provided in the County provided.

B. A schedule of Contract Values using AIA Document G703, 1992 Edition. A computer-generated form may be used provided it contains all the information required by AIA Document G703, 1992 Edition.

C. or if acceptable by the owner the County front-end agreement for submittals required for Final Payment.

1.07 The Contractor shall, within ten (10) days from the date of value of each item shall include a true proportionate amount of the Contractor's overhead and profit. The sum of all such scheduled values shall equal the Contract Sum as evidenced by the Agreement.

1.08 The approved form of Schedule of Contract Values will accompany and support the Contractor's periodic Applications for Payment and shall indicate the value of suitably stored material as well as labor performed and materials incorporated into the work for each subdivision of the schedule during the period for which the requisition is prepared.

2.0 EXCLUSION OF OWNER FROM LIABILITY

2.01 Notwithstanding any other provision of the Contract Documents, should the Contractor sustain loss or be damaged by act or omission of a separate Contractor, the Owner shall not be liable for any such loss or damage and the Contractor shall not be entitled to obtain any monetary relief from the Owner to compensate for any such loss or damage, but shall be limited to such recovery as is otherwise available at law from persons and/or entitles other than the Owner.

SECTION 00810 - PROGRESS PAYMENTS

3.0 SUBSTITUTION OF MATERIALS AND EQUIPMENT

3.01 Whenever a material, article or piece of equipment is identified on the Drawings or in the Specifications by reference to manufacturers' or vendors' names, trade names, catalog numbers, or the like, it is so identified for the purpose of establishing a standard, and any material, article, or piece of equipment of other manufacturers or vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or piece of equipment so proposed is, in the opinion of the Architect/Engineer, of equal substance, appearance and function. Any substitution shall be clearly identified to the Architect/Engineer and it shall not be purchased or installed by the Contractor without the Architect/Engineer's written approval.

4.0 NOTICE TO PROCEED

4.01 The Contractor shall not commence work on the Project until they have received from the Owner bonafide "Notice to Proceed."

4.02 A Letter of Intent will be issued immediately after the Board of City Commissioners approves the bid proposal for the project's scope of work. This letter is to be used to allow the Contractor to apply for the insurances and performance bond while the Contract is being prepared. Once the Contract has been reviewed and approved by the Board Attorney, and all insurances and bonds are received, the formal "Notice to Proceed" will be issued by the Owner.

(END OF SECTION 00810)

SECTION 00900 - SPECIAL CONDITIONS

SECTION INDEX

SECTION 00900 - SPECIAL CONDITIONS

1.0 COMMON REFERENCE STANDARDS

1.01 Reference in the Contract Documents to known standards such as codes, standard specifications, etc., promulgated by professional or technical associations, institutes, societies mean the latest edition of each such standard adopted and published as of the date of the Contract for the work of this Project, except where otherwise specifically indicated. The following is a representative list of such standards together with the abbreviation by which each is identified:

AAMA	Architectural Aluminum Manufacturers Association
AA	Aluminum Association
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AIEE	American Institute of Electrical Engineers
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute
API	American Petroleum Institute
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Standard 62-1 Ventilation for acceptable indoor air quality
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWSC	American Welding Society Code
AWWA	American Water Works Association
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard of National Bureau of Standards
FGMA	Flat Glass Marketing Association
NAAMM	National Association of Architectural Metal Manufacturers
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Assoc.
NFPA	National Fire Protection Association
SDI	Steel Deck Institute
SMACNA	Sheet Metal & Air Conditioning National Association
SSPC	Steel Structures Painting Council
TCA	Tile Council of America, Inc.
UL	Underwriters' Laboratories, Inc.

2.0 PROJECT MEETING (If required by owner)

2.01 To enable orderly review during progress of the Work, and to provide for systematic discussion of problems, the Owner will conduct project meetings throughout the construction period.

A. Minutes: The Owner will compile minutes of each project meeting and will furnish copies to the Contractor and to the Project Manager. The Contractor may make and distribute such other copies as he wishes.

B. Except as noted below for the Preconstruction meeting, project meetings will be held as necessary, but at least monthly. Coordinate as necessary to establish a mutually acceptable schedule for meetings.

C. To the maximum extent practicable, meetings will be held at the job site.

D. The Preconstruction Meeting will be scheduled after the Owner has received the contract signed from the contractor. Provide attendance with authorized

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representatives of the Contractor and all major subcontractors. The Architect/Engineer will advise other interested parties and request their attendance.

3.0 CONSTRUCTION MEETING (if the Owner requires)

3.01 Employ a scheduler who is thoroughly trained and experienced in compiling construction schedule data, in analyzing by use of Critical Path Method or PERT, and in preparation and issue of periodic reports as required below.

3.02 Within ten (10) days after receipt of Notice to Proceed submit one (1) reproducible and four (4) prints of construction schedule.

3.03 On the first working day of each month following the submittal described above, submit four (4) prints of the construction schedule updated.

3.04 Once Notice to Proceed (NTP) has been issued the contractor id to coordinate construction meeting schedule to reflect construction activities and pay application verification.

4.0 PRODUCT DATA AT JOB SITE

4.01 Satisfactory evidence as to the kind and quality of all materials and equipment, in the form of shop drawings, manufacturer's literature, samples, or certification shall be readily available at the job site at all times for the Architect/Engineer's inspection regardless of whether such evidence has been required in the project manual for submittal to the Architect/Engineer.

5.0 RECORD DRAWINGS (AS-BUILTS)

5.01 In accordance with the requirements of the General Conditions, the Architect/Engineer will provide the Contractor with a set of reproducible drawings of the original bidding documents, as required and at Contractor's expense as follows:

A. If the Contractor elects to vary from the Contract Documents, and secures prior approval of the Architect/Engineer, for any phase of the work other than those listed below, he shall record in a neat readable manner all such variances on the reproducible drawings furnished.

B. For plumbing, heating, ventilating and air conditioning, electrical and fire protection work, record drawings shall be maintained by the Contractor as the work progresses and as follows:

1) All deviations from sizes, locations and from all other features of all installations shown in the Contract Documents shall be recorded.

2) In addition, it shall be possible, using these drawings, to correctly and easily locate, identify, and establish sizes of all piping, directions and the like, as well as all other features of work which will be concealed underground and/or in the finished building.

a) Locations of underground work shall be established by dimensions to column lines of walls, locating all turns, etc., and by properly referenced centerline or invert elevations and rates of fall.

b) For work concealed in the building, sufficient information should be given so it can be located with reasonable accuracy and ease. In some cases, this may be by dimension. In others it may be sufficient

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to illustrate the work on the drawings in relation to the spaces in the building near which it was actually installed. Architect's/Engineer's decisions shall be final.

3) The following requirements apply to all Record Drawings:
   a) They shall be maintained at the Contractor's expense.
   b) All such drawings shall be done carefully and neatly by a competent draftsman and in form approved by the Architect/Engineer.
   c) Additional drawings shall be provided as necessary for clarifications.
   d) They shall be kept up-to-date during the entire course of the work and shall be available on request for examination by the Architect/Engineer and, when necessary, to establish clearances for other parts of the work.
   e) The record drawings shall be returned to the Architect/Engineer on completion of the work and are subject to the approval of the Architect/Engineer.
   f) Contractor may elect to retain the services of the Architect and Engineer of record in lieu of independent CAD operation to computerize the field As-Builts, so all field conditions are electronically documented.

6.0 OPERATION AND MAINTENANCE MANUALS

6.01 Submit **two (2)** copies of Operation and Maintenance Manual prior to indoctrination of operation and maintenance personnel. Include at least the following:

A. Neatly typewritten index near the front of the manual, giving immediate information as to location within the Manual of all emergency data regarding the installation.
B. Complete instructions regarding operation and maintenance of all equipment involved, including lubrication, disassembly, and reassembly.
C. Complete nomenclature of all parts of all equipment.
D. Complete nomenclature and part number of all replaceable parts name and address of nearest vendor, and all other pertinent data regarding procurement procedure.
E. Electrostatic copy of all guarantees and warranties issued. Dates should reflect the date of the Certified Substantial Completion. Items modified or installed after that date should be dated the date activated or installed.
F. Manufacturer's bulletins, cuts, and descriptive data, where pertinent, clearly indicating the precise items included in this installation and deleting, or otherwise clearly indicating, all manufacturer's data with which this installation is not concerned.
G. Such other data as required in pertinent other Sections of these specifications.
H. Technical data sheet on all material used.
I. All bacteria and related water test results.
J. Electronic file of a complete copy of each shop drawing submittal.
K. Compile As-Built Construction Documents

7.0 CLEANING UP

7.01 In addition to the provisions of Article 4.15 of the General Conditions, the following shall be required:

A. Besides the "removal of waste materials", the following special cleaning shall be required just prior to acceptance:

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1) Remove Stains: Wash and polish glass inside and outside. This work shall be done by a person skilled and equipped for such work.
2) Remove foreign matter, marks, stains, foreign paint, fingerprints, soil, and dirt from (and have in a polished condition where applicable) the following:
   a) Painted, decorated, and stained work.
   b) All hardware, fixtures, and incorporated equipment.
   c) All finished surfaces and metal surfaces, whether interior or exterior.
   d) All doors and windows, including tracks and rollers.
3) Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material or as approved by the Architect/Engineer.

B. In addition to clean-up provisions of the Specifications, Contractor shall take appropriate steps to prevent airborne dust due to the work of this Contract. Water shall be applied wherever practical to settle and hold dust to a minimum, particularly during excavation and moving of materials.

8.0 PROJECT CLOSEOUT

8.01 Prior to the Contractor submitting his/her final payment request, all closeout paperwork is to be complete and submitted for with each section applicable to the work information to be indexed and tagged. The closeout binder shall include, but is not limited to, the following list of items. The Contractor is to refer to each Section of the Project Manual for any additional items.

A. General List of Closeout Documents:
1. Provide a typed list of all Contractors, Subcontractors and Suppliers (if applicable) with addresses, telephone numbers and Contact's name.
2. Architect and Engineer punch list with each item identified with a signature as being successfully corrected and verified, or an explanation as to its current position.
3. All test results as noted in each section of the project manual.
4. Original copies of Final Releases (Conditional Releases will not be accepted).
5. As-built Drawings (Hard Copy and Computer Scans). Provide two (2) copies – one for the Owner and one for the Architect.
6. Equipment Maintenance Binders (2 copies minimum unless noted otherwise elsewhere in this Project Manual).
7. Warranties dated the date of substantial completion as noted by the Architect.
8. Date anticipated for post-occupancy inspection (± two weeks prior to the one-year warranty expiration).
9. Complete electronic copy of the approved shop drawings.
10. Complete copy of all test results.

8.02 Refer to Section 01700 Closeout Requirements of this Project Manual for additional direction and requirements.

9.0 TOXIC SUBSTANCES

9.01 The State of Florida has prepared a list of toxic substances. The Contractor shall review the list to determine if any materials which he will be installing are listed.

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9.02 The Contractor will notify the Owner in writing three (3) days prior to use of any toxic substances in the construction of the facility.

9.03 The Contractor shall comply with all State, Federal, and Local Regulations for the use of any toxic substances.

10.0 LEAD

10.01 No lead product shall be used on this project.

10.02 The use of solder that contains lead or paint that contains lead is not acceptable on this project.

10.03 The General Contractor is responsible for notifying all Subcontractors and Suppliers that no lead is acceptable on this project.

10.04 The General Contractor, Plumbing Subcontractor, Mechanical Subcontractor, Electrical Subcontractor, and Painting Subcontractor, shall provide written certification, prior to substantial completion that no lead has been used on this project and agrees to replace any lead if discovered at no expense to the Owner. The certification shall be addressed to the **City of Starke Board of City Commissioners**.

11.0 ASBESTOS

11.01 No asbestos, or products containing asbestos, will be used on this project.

11.02 The Contractor shall be responsible for notifying all Subcontractors and Suppliers of this requirement.

11.03 If by Independent Test Laboratory studies, the Owner discovers any asbestos products have been used on this project, the Contractor will be liable for necessary consulting fees, removal of asbestos products and installation of new product of similar value.

11.04 The General Contractor, the Mechanical Subcontractor, Electrical Subcontractor, Floor Subcontractor, Ceiling Tile Subcontractor, and Insulation Subcontractor shall provide, prior to substantial completion, a certification by the President of the Construction Company stating that no asbestos products have been used on this project and referring to the Agreement to remove any asbestos products, if discovered, addressed to the **City of Starke Board of City Commissioners** .

12.0 EQUAL OPPORTUNITY

12.01 The contractor shall maintain policies of employment as follows:

A. The Contractor and all Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, or age. The Contractor shall take affirmative action to ensure that applicant is employed, and the employees are treated during employment, without regard to their race, religion, color, sex, national origin or age. Such action should include, but not be limited to, the following: employment, upgrading, demotion or transfer,

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recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

B. The contractor and all subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, national origin or age.

(END OF SECTION 00900)

SECTION 01010 - SUMMARY OF WORK

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 General Coordination: The work contained in this project is limited to the construction of a new freestanding music pavilion built in the northwest corner of the downtown plaza area. The following is a list of coordination requirements:

1) The contractor is to carefully coordinate his/her work efforts with the county's project manager to ensure the daily operations of adjacent and active work areas are not compromised and construction efforts mindful of the interaction with the daily operations of the building.
2) Contractor to coordinate with Owner appropriate staging area for the storage and preparation of building materials.
3) Contractor to coordinate a construction schedule with Owners Project.
4) Drawings depict the areas of maintenance demolition and new construction but in general the construction efforts will consist of subsection 1.03 required work efforts.

1.03 The following is a descriptive summary of the maintenance and accessibility enhancement scope of work applicable to this project.

General Project Scope of Work:
This project consists of the construction of a free-standing pre-engineered steel framed pavilion with tensile canopy roof cladding as noted in the accompanying drawings. The pavilion will be sited in downtown Starke's Memorial Plaza nestled in the existing park flanked by SR100, South Church Street and East Call Street as noted on the site plan. The pavilion will be located in the northwest corner allowing easy access from South Church Street, which can be closed off during scheduled events. The raised pavilion will be constructed of CMU and stem wall base and a brick veneer on the 24" high pavilion base. The pavilion will be pre-engineered steel (powder coated) pavilion frame with four columns and a radiused canopy frame designed to receive a Teflon fabric tensile fabric canopy system.

Along the back portion of the pavilion contractor to construct a free-standing storage and rear screen projection booth to accommodate movie events and event backdrop projected images. The wood frame booth will have access door, a projection window, ventilation, a work counter and electrical, the front wall will have a series of electrical outlets in addition in the slab and perimeter seating walls to accommodate performances. The pavilion will have a series of steps and a handicap ramp accessing the change in elevation. The pavilion frame will be designed to accommodate three rows of truss framed outdoor theatrical lighting and a motorized audio/visual screen as noted on the drawings.

1.04 Refer to Section 01100 for Additive Alternates and request for substitutions which the Owner would like to include into the final project scope if fund availability allows.

(END OF SECTION 01010

SECTION 01020 - CUTTING AND PATCHING

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 Description of Work: "Cutting-and-patching" is hereby defined to include but is not necessarily limited to the cutting and patching of nominally completed and previously existing work, in order to accommodate the coordination of work, or the installation of other work, or to uncover other work for access or inspection, or to obtain samples for testing, or for similar purposes. It is defined to exclude integral cutting-and-patching during the manufacturing, fabricating, erecting, and installing process for individual units of work.

1.03 Demolition is recognized as an example of a related-but-separate category of work, which may or may not also require cutting-and-patching as defined in this section.

1.04 Refer to other sections of Project Manual for specific cutting-and-patching requirements and limitations applicable to individual units of work.

1.05 Quality Assurance:

A. Requirements for Structural Work:
   1. Do not cut-and-patch structural work in a manner resulting in a reduction of load-carrying capacity or load/deflection ratio.
   2. Prior to cutting-and-patching the following categories of work, obtain the Architect's approval to proceed with cutting-and-patching as proposed in the submittal by the Contractor:
   3. Structural Steel - Miscellaneous Structural Metals, including lintels, equipment supports, stair systems, and similar categories of work.
      a) Structural Decking
      b) Roof Framing Members
      c) Pressurized Piping, Vessels and Equipment

B. Operational and Safety Limitations:
   1. Do not cut-and-patch operational elements and safety-related components in a manner resulting in a reduction of capacities to perform in the manner intended or resulting in decreased operational life, increased maintenance, or decreased safety.
   2. Prior to cutting-and-patching the following categories of work, and similar categories where directed, obtain the Architect's approval to proceed with cutting-and-patching as proposed in the submittal by the Contractor.
   3. Sheeting, shoring and cross-lot bracing.
   4. Primary Operational Systems and Equipment.
   5. Water/moisture/vapor/air/smoke barriers, membranes and flashings.
   6. Noise and Vibration Control elements and systems.
   7. Control, communication, conveying, and electrical wiring systems.

C. Visual Requirements - Do not cut-and-patch work which is exposed on the exterior or exposed in occupied spaces of the building, in a manner resulting in a reduction of visual qualities or resulting in substantial evidence of the cut-and-patch work, both as judged solely the Architect. Remove and replace work judged by the Architect to be cut-and-patched in a visually unsatisfactory manner.

SECTION 01020 - CUTTING AND PATCHING

D. Any and all interruptions of existing facilities services shall be coordinated with Architect and Owner with ample notice for coordination of such work.

1.05 Submittals - Where prior approval of cutting-and-patching is required, submit proposal well in advance of time work will be performed, and request approval to proceed. Include description of why cutting-and-patching cannot (reasonably) be avoided, how it will be performed, how structural elements (if any) will be reinforced, products to be used, firms and tradesmen to perform the work, approximate dates of the work, and anticipated results in terms of variations from the work as originally completed (structural, operational, visual and other qualities of significance).

1.06 Materials - Except as otherwise indicated or approved by the Architect, provide materials for cutting-and-patching which will result in equal-or-better work than the work being cut-and-patched, in terms of performance characteristics and including visual effect where applicable. Comply with the requirements, and use materials identical with the original materials where feasible and where recognized that satisfactory results can be produced thereby.

1.07 Preparation - Provide adequate temporary support for work to be cut, to prevent failure. Do not endanger other work. Provide adequate protection of other work during cutting-and-patching, to prevent damage and provide protection of the work from adverse weather exposure.

1.08 Cutting-and-Patching - All trades will perform the necessary cutting to allow their materials to pass through existing floors, walls, or ceilings. All patching will be performed by the individual trades who built the walls, floors, or ceilings as part of their type of work.

1.09 Restore exposed finishes of patched areas and, where necessary, extend finish restoration onto retained work adjoining, in a manner which will eliminate evidence of patching.

1.10 Where patch occurs in a smooth painted surface, extend final paint coat over the entire unbroken surface containing the patch, after patched area has received prime and base coats, which have been properly feathered into adjoining areas.

(END OF SECTION 01020)

SECTION 01026 - UNIT PRICES

1.0 GENERAL

1.01 Summary: It is the intent of this section to provide for unit prices for listed items in quantities shown and for additional quantities that may be required by Owner or Architect/Engineer as being necessary for a complete, secure installation.

1.02 Inclusions:

A. Within each Unit Price, include labor, materials, equipment, mobilization, overhead, profit, and including, but not limited to, handling, storing, protecting, connecting, adjusting, testing, finishing, cleaning, and completing.
    1. Demolition, removal, and disposal of existing materials for each Unit Price shall be included as part of the Unit Price.
B. Execute work covered by a Unit Price in same manner as if included in a stipulated sum.
C. Include, as a part of the Base Bid, the sum of each allotted measurements for each Unit Price item.

2.0 EXECUTION

2.01 Unit Price No. 1: Removal and replacement of unsuitable soils (Clay) $_____ /c.y.

2.02 Unit Price No. 2: Removal and replacement of unsuitable foundation fill $_____ /c.y.

(END OF SECTION 01026)

SECTION 01027 - COST REPORTING AND PAYMENTS

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 Payments and Completion: Refer to City provided front-end General Conditions requirements contained within the agreement and to modifications and additions as called for in Supplementary Conditions.

1.03 Schedule of Values: (Unless allowed in the owner agreement) At least two weeks prior to filing the first payment request, the Vendor / Contractor shall submit to the Owner / Architect a correct, completely itemized schedule of the different materials or subdivisions of the work, based as nearly as possible on the sections of the specifications and as required by Subparagraph 9.2.1 of the AIA General Conditions. Quantities and unit prices of labor and materials shall be given, and each item shall include all items required for the execution of the Contract. Total columnar footings shall equal the Contract sum. The schedule shall be made up in accordance with the Application and Certificate for Payment AIA Forms G702 and G703, bound in the specifications pertaining to this project. Each item shall include prorated shares of profit and overhead.

1.04 Progress Payments: (Unless allowed in the owner agreement) Applications for payment shall be made monthly for the work done and for materials suitably stored at the site up to the last day of the previous month, or since the time of the last previous application for payment. Refer to County provided front-end of this project manual.

1.05 Four (4) copies of applications for partial payment, signed and notarized, shall be submitted on the following forms as bound in the specifications pertaining to this project:

1. if county requests do not contain a pay application guide line the following will apply;
   A. AIA Documents G702 - Application and Certification for Payment.
   B. AIA Document G703 - Continuation Sheet, with entries brought forward in proper columns for the current status.

1.06 The Owner / Architect shall certify payment of 90% of the value of work and materials, according to his best judgment of the correct amount.

1.07 The remaining 10% shall be retained until completion of the work and acceptance by the Owner.

(END OF SECTION 01027)

SECTION 01040 - COORDINATION, INSPECTION AND PROTECTION

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General Conditions, Supplementary Conditions and Special Conditions, (if any), along with the General Requirements, apply to the work specified in this Section.

1.02 The Contractor shall compare and coordinated all Drawings and Specifications. When in the opinion of the Contractor, a discrepancy exists, and he shall promptly report it to the Architect/Engineer for proper adjustment before proceeding with the work. Work conducted or implemented without direction in writing will be at the subcontractor/contractor's risk.

1.03 In the event that certain features of the construction are not fully shown on the Drawings, then their construction shall be of the same character as for similar conditions that are shown or noted. It is not uncommon or unusual to show one detail or elevation of a wall. If the term "typical" is used it is reasonably implied that detail or elevation is typical to the condition or space and all walls or conditions within the space are to be treated the same and as if shown.

1.04 Prior to commencing any work, the Contractor shall satisfy himself as to the accuracy of all survey data as indicated in these Plans and Specifications and/or as provided by the Owner. Should the Contractor discover any inaccuracies, error or omissions in the data survey, he shall immediately notify the Architect/Engineer in order that proper adjustments can be anticipated and ordered. Commencement by the Contractor of any work shall be held as an acceptance of the survey data by him after which time the Contractor has no claim against the Owner resulting from alleged errors, omissions, or inaccuracies of the said survey data.

1.05 General Coordination:

A. Coordinate the work of all trades so that any related work or items shown or specified elsewhere throughout the documents are included and the work completed as intended.

B. Coordinate the work of all trades so that each will have sufficient space and time within which to work properly and efficiently.

C. Changes in the intended design of the project as a result of improperly coordinated construction work will not be allowed. Delays in the work caused by rejections of installed materials due to improper coordination, and as otherwise specified, will not be considered valid justification for extensions of Contract time if such are requested by the Contractor.

1.06 Insofar as practical or if directed by the Architect/Engineer, HVAC systems and lighting levels shall be operational at designed levels prior to installation of painting materials, acoustical ceiling tiles, wall coverings and like items which could be damaged by unstable environmental conditions.

1.07 Altering of Structural Members:

A. No structural member shall be omitted, notched, cut blocked out, or altered for any reason without express written prior approval by the Architect/Engineer.

B. If any structural member is found to have been altered it shall be corrected as directed by the Architect at no additional cost.

SECTION 01040 - COORDINATION, INSPECTION AND PROTECTION

1.08 No deviation in the location of plumbing, mechanical, or electrical as shown will be allowed without approval of the Architect/Engineer.

2.0 PRODUCTS

2.01 Each trade shall review the work required of other trades and be aware of what products will be installed adjacent to their work. Complete, approved submittals and show drawings of the other trades shall be available for review at the job site at all times.

3.0 EXECUTION

3.01 All areas, substrates, and conditions under which any and/or all materials are to be installed shall be inspected and any conditions detrimental to proper and timely completion of the installation shall be documented to the Architect/Engineer. Work shall only proceed when such conditions have been properly corrected.

3.02 Protection: Coordinate the work of each trade so that upon completion of any installation protective conditions are maintained to ensure the work will be without damage or deterioration at the time of acceptance.

3.03 Inspection, Re-inspection, Re-approvals, and Delays:

A. If under the following conditions, the Contractor causes the Architect additional work, the Owner shall deduct such expenses from payment to the General or Prime Contractor. The Architect will inspect or review the work or submittals two times only, as part of the Contract. Except if after an approval the Contractor elects to make change and to resubmit, only the first review is so included. In the case of inspections (which may be phased with construction providing that each submittal must be completely informative) the criteria will apply to each separately. However, exhaustive inspection (or review) will not be required in ascertaining a continuing problem. Such a problem may be noted as a general application and it shall be the Contractor's obligation to find all such conditions and make corrections. On follow-up inspection or review, if the same problem becomes apparent as not having been corrected, further research will not be required, and general notice shall suffice. Such non-correction shall become the beginning of non-performance by the Contractor. And if in the situation of major error by the Contractor requiring extensive review and adjustment by the Architect, those costs will be deducted from the payment to the Contractor. If the contract time is exceeded by more than 2½%, the Architect's costs for Contract Administration and construction observation after that time shall be deducted from payment to the Contractor with or without other damages.

B. Definitions: THE TERM "SUBSTANTIAL COMPLETION" SHALL MEAN THAT SUBSTANTIALLY ALL MATERIALS REQUIRED OR IMPLIED BY THE DRAWINGS AND SPECIFICATIONS ARE INCORPORATED IN THE PROJECT, THAT SUBSTANTIALLY ALL LABOR HAS BEEN PERFORMED AND THAT THE WORK IS READY FOR A FINAL CHECK OR INSPECTION BY THE ARCHITECT AND ALL LIFE SAFETY SYSTEMS ARE VERIFIED AND APPROVED AS BEING IN WORKING ORDER. "Substantial Completion" shall not mean the inclusion of such minor alterations as patching as the Final Inspection shall disclose, but shall mean

SECTION 01040 - COORDINATION, INSPECTION AND PROTECTION

the building is ready for beneficial occupancy without any inconveniences to the Owner. If, upon Final Inspection of the project, more than ten (10) items are found to be uncorrected, the Architect reserves the right to terminate the Final Inspection at that point, until such time as all items are completed.

If the Contractor/Subcontractor propose alternate systems, configuration, or alternate products that deviate what is identified in the bid documents any and all Architectural/Engineering cost incurred to investigate or modify the bid documents are to be reflected in the Contractor's proposed cost savings before finalizing the final cost impact to the project.

4.0 INSPECTION PROCEDURES

4.01 The Contractor shall request from the City's Building Department all inspections identified on the appropriate building permit. This request shall be made a minimum of 24 hours in advance of the desired inspection time. The request shall be made in writing by e-mail or fax. A copy shall also be sent to the project Architect/Engineer that he/she will coordinate the particular engineer to be present as required.

4.02 The Building Code inspector or Architect, if approved by the Authority having Jurisdiction, will sign off once the inspections have been successfully accomplished.

4.03 Should a particular section fail an inspection; the Contractor shall make appropriate correction and re-submit for re-inspection. Provide 24 hours' notice.

4.04 The Contractor is required by the specifications to perform other test and inspections. The Contractor shall maintain in the field office copies of all test reports for review by the Building Code Inspector.

(END OF SECTION 01040)

SECTION 01042 - DIRECT PURCHASE PROCEDURES

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General Conditions, Supplementary Conditions and Special Conditions, (if any), along with the General Requirements, apply to the work specified in this Section.

1.02 Description: The Owner is tax exempt from sales tax on the purchase of construction materials. The Owner has elected to exercise this right to purchase directly various construction materials, supplies, and equipment that may be a part of this contract. Such direct purchase shall be without any additional cost to the Owner. The Owner will deduct State sales tax only and will not deduct City surtax. It will be the Contractor's responsibility to notify companies providing services that the Owner surtax will not be deducted. The Owner will, via Construction Purchase Orders (CPO), purchase the materials and the Contractor shall assist the Owner in the preparation of the purchase orders. The materials shall be purchased from the Vendors selected by the Contractor for the price originally negotiated by the Contractor.

1.03 The contract amount shall be reduced by the net, undiscounted amount of the purchase orders plus all sales taxes. This reduction in the contract amount will be implemented utilizing the AIA Change Order Form, which will reference the Construction Purchase order effecting the change.

1.04 Issuance of Construction Purchase orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding material purchases or installations, with the exception of the payments for the materials as purchased. The contractor shall remain fully responsible for coordination, correct quantities ordered, submittals, protection, storage, scheduling, shipping, security, expediting, receiving, installation, cleaning and all applicable warranties. The Contractor must maintain his Builder's Risk policy to include materials stored on-site and materials installed on site.

1.05 It is recognized that the Contractor may encounter additional overhead costs in assisting the Owner with this task. The Contractor is charged with including all addition al costs as a part of the Base Bid.

1.06 No payment will be made for materials stored off-site. Payment is contingent on the receipt of properly verified and approved delivery tickets.

1.07 Terms: For the purpose of this Section the following terms will be defined:

A. Material - Any material, supply, or item of equipment intended for permanent installation in the project.
B. Vendor - A company supplying materials to the project, whether such provision includes installation or not.
C. List of Vendors - A list of Vendors whose materials are required for the construction of the project and which is submitted to the Owner by the Contractor for approval.
D. Vendor Purchase Order (VPO) - A material list and price quote by a Vendor required for issuance of a Construction Purchase Order by the Owner.
E. Construction Purchase Order (CPO) - An authorization issued by the Owner for the supply of stated materials and agreement to pay quoted price for material upon verification of delivery.

SECTION 01042 - DIRECT PURCHASE PROCEDURES

F. Delivery Ticket - A receipt issued on the Vendor on a business-like form indicating the date, quantity, and type of materials delivered to the site and referencing a vendor's invoice or the Construction Purchase Order.

2.0 PRODUCTS [Not applicable.]

3.0 EXECUTION

3.01 Within fifteen (15) days of executing the agreement, the Contractor shall submit a List of Vendors and materials to the Owner for approval. The list shall contain the following information:

A. Vendor's full business name
B. Vendor's agent assigned to the project
C. Vendor's business telephone number
D. Materials the Vendor will supply

3.02 Upon approval of the Vendors by the Owner, each Subcontractor, or Vendor if no Subcontractor is involved in the installation of the material, shall issue a Vendor's Purchase Order (VPO) addressed to the Owner and submitted to the Contractor for review and approval prior to submission to the Owner's representative. The VPO shall contain the following minimum information.

A. Date of issuance
B. Project name and location
C. Vendor's full business name
D. Vendor's full business address
E. Vendor's business telephone number
F. Description of materials
G. Quantity of each material
H. Unit cost of each material
I. Extended price of each material (quantity time unit cost)
J. Sales tax on materials
K. Total price (extended prices plus sales tax, shipping, and handling charges)
L. Signature and printed name of the authorizing agent for the Subcontractor or Vendor
M. Signature and printed name of the authorizing agent for the Contractor

3.03 The Owner will issue a Construction Purchase Order in the amount of the Vendor's Purchase Order less the sales tax. The Construction Purchase Order will contain the following minimum information:

A. Date of issuance
B. Project name and location
C. Vendor's full business name
D. Vendor's full business address
E. Reiteration of the authorized quantity, material description, unit cost, and extended price for each material
F. Sales tax
G. Total price including sales tax
H. Signature and printed name of approving agent for the Owner
I. Signature and printed name of authorizing agent for the Owner

The CPO will be sent directly to the Vendor with a copy retained by the Owner and copies sent to the Subcontractor, Contractor, and Architect.

SECTION 01042 - DIRECT PURCHASE PROCEDURES

3.04 Upon receipt of the CPO by the Vendor, the Vendor shall ship the requested material and issue an invoice to the Owner for payment on materials that were shipped. The invoice shall clearly reference the CPO number.

3.05 All materials are to be received on the site with the Vendor's delivery ticket. The delivery tickets will be utilized by the subcontractor to certify both price and quantities of materials received. The subcontractor will then (upon verification) submit the invoice to the City of Starke Facility department (the invoice shall be signed and contain the date and printed name of the individual signing the invoice).

3.06 The Owner will issue payment to the Vendor for the amount of the Vendor's invoice upon receipt of the verified invoices. The Owner shall provide a payment schedule to the Contractor and any Subcontractor or Vendor upon request. In order to maintain timely payments, it will be the responsibility of the Subcontractor/Vendor and the Contractor to process delivery tickets in accordance with the payment schedule.

3.07 The Contractor shall be responsible for maintaining a summary of materials purchased and tax savings for inclusion on the AIA Form G702, Application, and Certification for Payment. The total cost of goods directly purchased by the Owner shall appear on Line 8 and the total sales tax savings on goods directly purchased by the Owner shall appear on Line 9. Both lines will then be deducted from the contract amount via Change Order when determining payment due to the Contractor.

SECTION 01042 - DIRECT PURCHASE PROCEDURES

VENDOR PURCHASE ORDER

DATE: _____

PROJECT: _____

BID PACKAGE NO.: _____

DELIVER TO: _____

ADDRESS: _____

CITY/ST: _____

DELIVERY DATE: _____

VENDOR: _____

_____

_____
(Print Vendor's Name, Address, City State, Zip Code.)

CONTACT PERSON: _____

PHONE: _____ FAX: _____E-MAIL: _____

QUANTITY	DESCRIPTION OF MATERIALS	UNIT COST	PRICE
THIS IS TO REQUEST A PURCHASE ORDER ONLY. VENDOR MUST SEND INVOICE AND DELIVER MATERIALS TO SITE TO RECEIVE PAYMENT.		**SUBTOTAL**	
		SALES TAX	
		TOTAL	

_____ _____
(Signature) Phone Number (Signature) Phone Number

_____ _____
(Signature) Phone Number (Signature) Phone Number
Authorized Agent for Subcontractor Authorized Agent for Subcontractor

(END OF SECTION 01042)

SECTION 01060 - CODES, PERMITS AND FEES

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General Conditions, Supplementary Conditions and Special Conditions, (if any), along with the General Requirements, apply to the work specified in this Section.

1.02 All work contained under this Contract is based on the requirements contained in the latest one or more of the following:

A.	The Standard Florida Building Code	8th Edition
B.	Florida Standard Plumbing Code	8th Edition
C.	Florida Standard Mechanical Code	8th Edition
D.	Florida Standard Gas Code	8th Edition
E.	Florida Fire Prevention Code	8th Edition
F.	NFPA 70, National Electrical Code	2023
G.	NFPA 101 Life Safety Code	2024
H.	NFPA-72 National Fire Alarm & Signaling Code	2022
I.	NFPA-13 Standard Installation for Installation of Sprinkler Systems	2022
J.	NFPA-58-11 Liquified Petroleum Gas Code	2020
K.	ANSI A117.1 (Physically Handicapped)	2017 (or latest edition).
L.	Other Standards as referenced or specified in other sections	

1.03 Contractor and all Subcontractors shall comply with all laws, codes, and ordinances applicable to the work. This shall include Federal, State, County, and/or Municipal Entities having jurisdiction. Refer to Section 01000(9) for information on permits and Governing Codes.

1.04 If governing Laws, Codes or Ordinances conflict with this Specification, then the Laws, Codes or Ordinances shall take precedence, except where these Specifications exceed them in quality of materials or labor, then the Specifications shall be followed. When a conflict occurs, the Architect/Engineer shall be notified before proceeding with the work.

1.05 Except as otherwise required by this Section, all products and workmanship shall conform to the best quality and practices recognized by Agencies, Associations, Councils, etc., as specified in individual Sections.

1.06 In the absence of specified standards, the Contractor shall conform to the requirements of the most widely recognized standards for each particular portion of the work.

(END OF SECTION 01060)

SECTION 01100 – ALTERNATES/SUBSTITUTIONS

1.0 SCOPE

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 It is the purpose of this section of the specifications to describe items that are to be included in the Contractor's proposal as Additive Alternates.

1.03 It is not the intent of this section of the specifications to describe methods of construction or installation of alternate items, but only to itemize the extent of Alternates. See Drawings for additional information concerning the extent of Alternates and their locations.

1.04 In the event that Alternates are accepted, all provisions of documents, contract drawings, other contract documents, and the various trade sections of these specifications will govern any Alternate construction, materials, or equipment.

1.05 Alternates may be accepted in any order the Owner selects up to the limit of monies available.

1.06 Each bidder shall state in his proposal the amounts to be added or deducted to the Base Bid for all Alternates in accordance with the following Alternate proposals.

1.07 A bidder may be excluded from consideration for the award of the contract if he has not submitted a price for a particular Alternate that the Owner chooses to accept.

2.0 ALTERNATE PROPOSALS

2.01 **Additive Alternate No.1 – Standing Seam Metal Roof System:** Contractor to provide a figure to be added to the base bid representing the required labor and material for a complete installation of a standing seam metal roof panel system over peel and stick underlayment in lieu of a single ply roof membrane. Contractor to provide all miscellaneous incidentals needed for a complete installation. Contractor to field verify field conditions to familiarize themselves with all field conditions.

2.02 **Deductive Alternate No.2 – Split Face Block in Lieu of CMU with Brick Veneer:** Contractor to provide a figure representing the cost / credit back to the project for all labor, material and miscellaneous incidentals for the use of 8x8x16 split face block in line of the CMU brick veneer and the perimeter walls of the raised stage and perimeter seat as illustrated at the exterior elevations.

2.03 **Deductive Alternate No.3 – Roof and Wall Insulation:** Contractor to provide a figure representing the cost / credit back to the project for all labor, material and miscellaneous incidentals for the elimination of CMU core fill insulation in the wall and rigid insulation between the roof deck and roof membrane ½" "DensGlass" underlayment.

2.04 **Additive Alternate No.4 – Ornamental Vegetation Grilles:** Contractor to provide a figure to be added to the base bid representing the required labor and material for a complete installation of (9) 3'-0" wide x 7'-0" tall vegetation climbing screen panels as noted along the ramp of the amphitheater.

(END OF SECTION 01100)

SECTION 01150 – STANDARDS

1.0 GENERAL

1.1. RELATED DOCUMENTS

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

B. In addition to "The Florida Building Code 8th Edition, all, or the specific portions cited, of the following building codes are hereby incorporated by reference and made a part of this rule. In the case of conflicting requirements or where the UBC is mute, the more, or most stringent shall apply. The following codes, standards, and references shall be the latest edition:

a. **ACI 318.** American Concrete Institute, "Building Code Requirements for Structural Concrete and Commentary".
b. **AHERA.** Asbestos Hazard Emergency Response Act, 40 CFR, Part 763.
c. **AISC.** American Institute of Steel Construction edition adopted by the FBC.
d. **AISI.** American Iron and Steel Institute.
e. **ANSI.** American National Standards Institute.
f. **ASCEW.** American Society of Civil Engineers. References to ASCE 7. Standards shall be the latest edition.
g. **ASHRAE.** American Society of Heating, Refrigeration, and Air Conditioning Engineers.
h. **ASIC.** American Society of Irrigation Consultants.
i. **ASTM.** American Society for Testing Materials.
j. DCA. Department of Community Affairs.
k. Florida Americans with Disability Implementation Act and the Florida Accessibility Code for Building Construction, as adopted by the State Board of Building Codes and Standards.
l. Florida Energy Efficiency Code for Building Construction (FEEC), as adopted by the State Board of Building Codes and Standards under Rule 9B-3.047 FAC.
m. **DOT – AASHTO.** American Association of State Highway and Transportation Officials "Standard Specifications for Highway Bridges" as modified by Florida DOT Structures Design Guidelines.
n. **FBC.** Florida Building Code, all code divisions.
o. **FBC.** Fuel Gas Code.
p. **FBC.** Mechanical Code.
q. **FBC.** Plumbing Code.
r. **FBC.** Test Protocols for high velocity hurricane zones.
s. **FEMA. Federal Emergency Management Agency.** Rules and Regulations 44 CFR, Parts 59 and 60, for flood plain criteria governing insurability of facilities constructed in flood plain areas.
t. **MIL-L-19140E.** Military Specifications for Lumber and Plywood, Fire Retardant Treated.
u. **NEC.** National Electrical Code, (NFPA 70).
v. **NFOPA.** National Forest Products Association.
w. **NFPA.** National Fire Protection Association. NFPA 101 and other NFPA codes as applicable. Exceptions are NFPA 101 Sections 10-2.2.7 and 10-

SECTION 01150 – STANDARDS

7.2.2.7 “Exit Passageways” and where NFPA codes are exceeded by these State Requirements.

x. **OSHA.** Occupational Safety and Health Administration, U.S. Department of Labor, 29 CFR.
y. **SBC/SSTD-12.** SBCCI Test Standard for determining impact resistance from wind borne debris.
z. **SJI.** Steel Joist Institute.
aa. **TMS.** The Masonry Society Standards; TMS 602, TMS 402.
bb. **SMACMA.** Sheet Metal and Air Conditioning Material Association.

(END OF SECTION 01150)

SECTION 01200 - JOB SITE ADMINISTRATION

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General Conditions, Supplementary Conditions and Special Conditions, (if any), along with the General Requirements, apply to the work specified in this Section.

1.02 Project Superintendent: The Contractor shall provide a qualified, superintendent at the project site throughout the construction. The superintendent shall maintain, at the job site, a complete and accessible file containing all submittals, shop drawings, and samples approved by the Architect/Engineer as well as supplemental erection or installation instructions for these items.

1.03 Site Access: Access to the site and construction operations shall at no time interfere with normal business operations of existing neighboring buildings or their parking, nor cause damage to any of the existing buildings, paving, utilities or landscaping. In the event that any should occur, the Contractor shall repair, replace, or otherwise correct the damage at his own expense.

1.04 Periodic Cleaning: The Contractor shall maintain the building and site in a safe manner, free from accumulation of construction debris. Clean and remove debris at least once a week.

1.05 Site Maintenance: Comply with the requirements of the governing authorities concerning the use of the public streets and right-of-way's for deliveries, access, and construction. Maintain in good condition and repair or replace pavement, curbs, utilities and other improvements damaged during construction to the satisfaction of the governing authority having jurisdiction.

1.06 Preconstruction Organization: Before beginning work at the site the Contractor shall attend a preconstruction conference scheduled by the Owner and or Architect and bring with him the Superintendent employed for this project. In the event the Contractor is unable to attend, he shall send a letter of introduction by the Superintendent in which he advises the Superintendent's full name and states that he is assigned to the project and will be in full responsible charge. At this time all parties concerned will discuss the project under contract and prepare a program of procedure in keeping with requirements of the Drawings and Specifications. The Job Superintendent or his designee will be present on the job site during work efforts to ensure Safety and Quality Control of his / her work efforts. This will insure the Architect/Engineer or Owner representative will have access to a representative of the Contractor at all times. The Superintendent shall henceforth make every effort to expeditiously coordinate all phases of the work, including the required reporting procedure, to obtain the end result within the full purpose and intent of the Plans and Specifications for the project. The Contractors representative (Superintendent) will insure that any Owner equipment/instructional material left in the construction area shall not become a victim of theft, damage, or destruction. The Owner will be responsible to insure all Owner equipment/instructional material left in the construction area are under lock and key or be so protected as to not allow them to be easily removed. The Contractor shall not remove the Superintendent without first contacting the Architect/Engineer in writing. Then only by providing the new Superintendent enough time to familiarize themselves with the project.

SECTION 01200 - JOB SITE ADMINISTRATION

1.07 General:

A. Prior to the start of construction, the Architect/Engineer will arrange a pre-construction meeting to be attended by the Owner, Architect/Engineer, and Contractor.

B. The purpose of this conference will be to discuss and clarify contract administration procedures which will be employed during construction.

C. Pre-construction meeting shall be held at time and date to be determined by the Owner.

1.08 Pre-construction Meeting:

A. Attendance:

1. Owner
2. Architect/Engineer
3. Contractor and Job Superintendent (Sub-Contractors)

B. Agenda:

1. Tentative construction schedule.
2. Critical work sequencing.
3. Relation and coordination of subcontractors.
4. Designation of responsible personnel and duties.
5. Processing of field decisions and Change Orders.
6. Submittals of Shop Drawings where required.
7. Use of premises and site.
8. Delivery of materials.
9. Security procedures.
10. Other pertinent activities.

(END OF SECTION 01200)

SECTION 01300 – SUBMITTALS

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General Conditions, Supplementary Conditions and Special Conditions, (if any), along with the General Requirements, apply to the work specified in this Section.

1.02 Construction Schedule:

A. The Contractor, within ten (10) days of award of the Contract, shall prepare and submit, with approval of the Owner and or Architect/Engineer, a complete graphic construction schedule showing dates upon which each item or Subdivision of the work shall begin and end. Schedule shall also show required delivery dates for material or equipment to be supplied by the Owner.
B. The graphic schedule shall be divided into at least weekly periods so that at any period the actual state of the work may be clearly determined.
C. Schedule shall be updated monthly and distributed to appropriate agencies.

1.03 Manufacturer's Specifications:

A. Where the name of a concern or manufacturer is mentioned on the Drawings or in the Specifications in reference to his required service or product, and at no qualifications or specifications of such is included, then the material gauges, details of manufacturer, finish, etc., shall be in accordance with his standard practices, directions, or specifications. The Contractor shall be responsible for any infringement of patents, royalties, or copyrights which may be incurred thereby.

2.0 PRODUCTS

2.1 Shop Drawings and Samples:

A. Shop Drawings and submittals as required by other Sections of these Specifications shall be submitted in a timely manner, dated and contain the following: name of project; and complete description or names of equipment, materials and items, and complete information including locations which materials are to be installed, and methods of attachment or anchorage.
B. Shop Drawings shall be accompanied by transmittal letter containing project name, Contractor’s name, number of drawings, titles and other pertinent data. Each submittal shall be numbered sequentially and the reference number used as identification on all correspondence.
C. Submittals shall be on opaque paper and may also be manufacturers printed data sheets adapted to the project requirements. Submit in sufficient quantity to provide the following:
    1. Copy for Owner
    2. Copy for Architect
    3. Copy for Engineer
    4. Copy for Consultant (if appropriate)
    5. Copies required by Contractor
    6. Copy for job site
    7. Copy for Subcontractor

    Number of submittals required will be determined at the Pre-construction meeting. In general, the Owner retains one (1) copy, Architect one (1) copy and at the end of the project the Contractor to assemble one (1) copy of each shop drawing as part of the close out.

SECTION 01300 – SUBMITTALS

D. Shop Drawings submitted to the Owner / Architect/Engineer for his approval shall first be thoroughly checked for conformance and interfacing with adjacent systems and approved by the Contractor, the prima facie envelope of which shall be a "checked" stamp marked "Approved as Noted" on each Shop Drawing, placed thereon by the Contractor. Architect/Engineer Shop Drawings received without the Contractor's "checked" stamp will be cause for immediate return without further action. Each drawing correctly submitted will be checked by the Architect/Engineer and marked by him in one of the following ways:
   1. No exceptions taken.
   2. Comply with markings.
   3. Revise and re-submit.

E. The samples required shall be as specified and shall include identification of the specific item and the submittal number to which it applies. To allow Owner and Architect to develop a color scheme, full-color samples shall be furnished for at least the following items:
   1. Samples:
      - PVC Single-Ply Roof and Underlayment
      - Aluminum Wall Panel System

F. It shall be the responsibility of the Contractor to properly schedule the submission of Shop Drawings for approval to allow adequate time for checking of Drawings, manufacturer and shipment of items to job site in sufficient time to prevent delaying Progress Schedule. The Architect/Engineer will require roughly one week typically to review shop drawings of average size, larger complicated submittals may require additional time. Color related shop drawings may be reviewed at the Architect/Engineer's discretion without having all the color related samples on hand and note colors to follow until the overall color scheme has been finalized.

G. It shall also be the responsibility of the Contractor to coordinate the preparation of Shop Drawings of items that will be furnished by more than one manufacturer but are designed to interface when installed.

H. The Owner will not grant time extension based on delays due to improper scheduling of work; and the Owner, at his discretion, may withhold progress payments until such time as these requirements are fully satisfied.

I. The following is a partial list of required Shop Drawings and Descriptive Literature. Provide Shop Drawings and/or Descriptive Literature of other items as required in the Technical Sections of the Specifications.

   1. Lighting / Electric
   2. Metal roof Panel
   3. Peel & Stick Underlayment
   4. Metal Wall Cladding System
   5. Single-Ply Roof Membrane
   6. Fascia / Eave Flashing
   7. Steel Roof Framing
   8. Etcetera

SECTION 01300 – SUBMITTALS

2.02 **Warranties and guarantees shall begin on the official date of substantial completion and shall be in effect for a minimum of one year unless specified for a longer period. Include all specific items covered, company name(s) and addresses and name of person authorized to warrant or guarantee items, if not blanket coverage.**

A. If, within any guarantee period repairs or changes are required in connection with the guarantee work which, in the opinion of the Architect or Engineer, is rendered necessary as the result of the use of materials, equipment or workmanship which are defective or inferior or not in accordance with the terms of the Contract, the Contractor shall promptly upon receipt of notice from the Owner, and without expense to the Owner, proceed to:

1. Place in satisfactory condition in every particular, all of such guaranteed work, correct all defects therein, and:
2. Make good all damages to the structure or site or equipment or contents thereof which, in the opinion of the Architect or Engineer, are the result of the use of materials, equipment or workmanship which are inferior, defective, or not in accordance with the terms of the Contracts; and

3. Make good any work; materials; equipment; contents of structures or site disturbed in fulfilling any such guarantee. If the Contractor, after notice, fails to proceed promptly to comply with the terms of guarantee, the Owner may have the defects corrected and the Contractor and his Surety shall be liable for all expenses incurred.

2.03 The Contractor shall deliver to the Owner, as part of the Final Completion Requirements, **Two (2)** complete sets of Maintenance and Operating Manuals, in hardcover ring binders, indexed and divided into the Sections, with tabs for ease of locating the various Sections. **One (1)** copy is to be submitted directly to the Owner and **one (1)** copy to be forwarded to the architect and individual engineers for their review and return to the architect for delivery to the Owner with the compliance or deficiency letter. The Contractor shall deliver to the Owner: **Two (2)** copies of the manufacturer's name and address, nearest distributor's name, address and phone number, nearest service representative's name, address, office and home phone numbers, complete diagrams, operating instructions, maintenance manuals and parts lists for each item of equipment.

2.04 Review of Submittals:

A. Architect/Engineer's review is for general compliance with Contract Documents. Markings do not relieve the Contractor from compliance with requirements of Contract Documents. The Contractor is responsible for correctness of dimensions and details and for coordination of the work of all trades.
B. Any submittal marked "Revise and Resubmit" shall be corrected in a timely manner and clearly marked as a re-submittal.

2.05 Written Documents:

A. All written documents, including letters, transmittals and requests by the Contractor shall be on standard letter or legal-size paper and include Contractor’s name, project name, Architect/Engineer's project number, date, and be signed by authorized personnel.

SECTION 01300 – SUBMITTALS

B. The Architect/Engineer, in noting and marking submittals, will use the color red. The Contractor shall use the color green. All other colored markings shall be disregarded.
C. The contractor shall have at least one complete set of Contract Documents, approved submittals and Shop Drawings on the job site at all times, when work is in progress.

2.06 As-Built Drawings:

A. Upon Final Completion of the Work, the data shall be recorded in ink, to scale, by a competent draftsman on black line prints on transparent (reproducible) paper of the Contract Drawings. Where changes are to be recorded, the black line prints shall be erased before the changes are made. Each sheet shall bear the date and name of the Subcontractor submitting the Drawings. Two sets of the black line prints and four copies of a CD scan shall be submitted to the Architect/Engineer upon completion.
B. As built finals shall be delivered at Final Completion as part of the close out documents.

(END OF SECTION 01300)

SECTION 01320 - PROGRESS REPORTING

1.0 PROGRESS SCHEDULE (To be coordinated with Owner)

1.01 Within ten (10) days after the date of the Owner's issuance of a Notice to Proceed, the Contractor shall prepare and submit to the Architect/Engineer a construction schedule in quadruplicate graphically depicting the activities contemplated to occur as a necessary incident to performance of the work required to complete the project, showing the sequence in which the Contractor proposes for each such activity to occur and the duration (dates of commencement and completion, respectively) of each such activity.

1.02 At least once each month, the Architect/Engineer shall determine whether the construction schedule developed and submitted by the Contractor meets the requirements stated above and whether the progress of the work complies with the Contractor's schedule. Failure of the Contractor to develop and submit a construction schedule as aforesaid shall be sufficient grounds for the Architect/Engineer to find the Contractor in substantial default and certify to the Owner that sufficient cause exists to terminate the contract or to withhold any payment.

1.03 Following development and submittal of the construction schedule as aforesaid, the Contractor shall, at the end of each calendar month occurring thereafter during the period of time required to finally complete the subject project, or at such earlier intervals as circumstances may require, update and/or revise the construction schedule to show the actual progress of the work performed and the occurrence of all events which have affected the progress of performance of the work already performed or will affect the progress of performance of the work yet to be performed in contrast with the planned progress of performance of such work, as depicted on the original construction schedule and all updates and/or revisions thereto as reflected in the updated and/or revised construction schedule last submitted prior to submittal of each such monthly update and revision. Each such update and/or revision to the construction schedule shall be submitted to the Architect/Engineer in duplicate. Failure of the Contractor to update, revise and submit the Construction Schedule as aforesaid shall be sufficient grounds for the Architect/Engineer to find the Contractor in Substantial Default and certify to the owner that sufficient cause exists to terminate the Contract or to withhold payment to the Contractor until a schedule or schedule update acceptable to the Architect/Engineer is submitted.

1.04 The Contractor shall have the option of scheduling a substantial completion date established by the Contract Documents for substantial completion; provided, however, in such event such earlier substantial completion date will be recognized by the Owner only as a matter of convenience to the Contractor and shall not change the date for substantial completion established by the Contract Documents or be otherwise binding on the Owner or anyone under the Owner's control; and provided further, however, in such event should events occur during performance of the work necessary to complete the subject project which would justify the granting to the Contractor of an extension of the Contract Time pursuant to the provision of Article 8 of the AIA General Conditions which form a part of the Contract Documents, the Contractor shall be entitled to receive only such an extension of the Contract Time as is determined by the Architect/Engineer to be due the Contractor as follows:

A. In the event the currently approved Contractor's schedule indicates completion ahead of the contractually established date for Substantial Completion, the time extension to the Contract shall only be determined, when the total time directly affecting the critical path of the schedule is added to the end date of the schedule

SECTION 01320 - PROGRESS REPORTING

thereby making a new end date beyond the contractual completion date, as the time between the contractual completion date and the new schedule end date.

B. In the event the currently approved Contractor's schedule indicates completion at or after the contractually established date for Substantial Completion, the time extension shall only be added to the contractually established date for Substantial Completion and shall be determined by the Architect/Engineer as the portion of delay time directly affecting the critical path of the current approved contract schedule.

2.0 PROGRESS REPORTS

2.01 As accompaniment to the monthly updated Progress Schedule, the Contractor shall submit a Monthly Progress Report in a concise and attractive format approved by the Architect/Engineer. The Monthly Progress Report shall address separately each of the following topics:

A. General progress of the work during the preceding month.
B. Progress outlook for the upcoming month.
C. Change orders, including status of any pending changes in the work.
D. Administrative: Delays in the work during the preceding month; current or anticipated delays; any needed decisions regarding the work.
E. Information needed from the Architect/Engineer.
F. Information needed from the Owner.

2.02 Photographs illustrating the report and/or documenting the progress may be included in the report as required by the Project Manager.

(END OF SECTION 01320)

SECTION 01410 - PROCEDURES AND QUALITY CONTROL

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

1.02 Codes and Regulations: Construction shall meet the requirements of the 8th Edition Florida Building Code and the 8th Edition, Florida Fire Prevention Code. Refer to Section 01060 for specific applicable codes.

1.03 Codes and Regulations: The Contractor shall be responsible for the calling to the Architect's attention any details or specifications that are not in conformance with applicable codes. Where no specific method or form of construction is called for in the Contract Documents, the Contractor shall comply with 8th Edition Florida Building Code requirements in carrying out such work.

1.04 Comply with regulations and codes of suppliers of utilities, and comply with all other local, state, and federal regulations and standards concerning building construction.

1.05 General Quality and Standards: To facilitate rapid examination, the detailed Specifications concerning basic requirements for labor, materials, equipment, and/or incidentals to be used on the project are included under the various divisions in as brief a form as is consistent with clarity. The primary concern of the detailed Specifications is for standards of performance expected for the finished work.

1.06 The interests of the Owner, the General Contractor, and others concerned with the work require the inclusion of certain general governing requirements and standards, as a precaution against contingency and to provide for the conditions under which the construction and the administration of the work will be carried out.

1.07 General requirements for the quality of the work, when not otherwise covered in more specific detail in the Specifications, will be governed by certain trade standards as described in this section on "Procedures and Quality Control."

1.08 These Specifications consider the project as a whole and assume its completion under a General Contract. Further, the scope of subcontractors and the quantities of materials and labor supplied to the General Contractor by others are assumed to be matters governed by agreement between the General Contractor and his subcontractors and suppliers and not by agreement between the Owner and any subcontractor or supplier.

1.09 Various sections of the construction specifications are intended to govern only the quality of work and/or materials incidental to the particular branch of work mentioned in this section title. Sections are not intended as itemizations of the work or materials to be furnished or to limit or define the scope of any subcontract or agreement to furnish material and labor.

1.10 The furnishing of all items of material, labor, equipment, and/or incidentals necessary to the completion of the project as a whole will be expected when such items are called for on the Drawings by diagram, note, or schedule, are listed in the Specifications, or are reasonably inferred by either or a combination of both to ensure a complete assembly and project.

SECTION 01410 - PROCEDURES AND QUALITY CONTROL

1.11 Substitutions: Products are generally specified by ASTM or other reference standard and/or manufacturer's name and model number or trade name. When specified only by reference standard, the Contractor may select any product meeting this standard, by any Manufacturer. When several products or manufacturers are specified as being equally acceptable, the Contractor has the option of using any product and manufacturer combination listed.

1.12 After the Contract has been executed, the Owner and the Architect will consider a formal request for the substitution of products in place of those specified, under the following conditions.

A. The request is submitted within thirty (30) days after the award of the Contract.
B. The request is accompanied by complete data on the proposed substitution substantiating compliance with the Contract Documents, including product identification and description where applicable and an itemized comparison of the proposed substitution with the products specified or named by Addenda with data relating to contract time schedule, design and artistic effect where applicable and its relationship to separate contracts.
C. The request is accompanied by accurate cost data on the proposed substitution in comparison with the product specified, whether or not modification to the contract sum is to be a consideration.

1.13 Requests for substitution based on the above conditions, when forwarded by the Contractor to the Architect, are understood to mean that the Contractor:

A. Personally, investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified.
B. Will provide the same guarantee for the substitution that he/she would for that specified.
C. Certifies that the cost data represented are complete and include all related costs under this Contract but exclude costs under separate contracts and the Architect's redesign costs and that he/she waives all claims for additional costs related to the substitution which subsequently become apparent.
D. Will coordinate the installation of the accepted substitute, making such changes as may be required for the work to be complete in all respects.
E. Contractor will be responsible for reimbursement of any and all costs to the Architect for additional Architectural and Engineering efforts required to implement contractor proposed changes.

1.14 Substitutions will not be considered if:

A. They are indicated or implied on shop drawing submissions without the formal request required above.
B. For their implementation they require a substantial revision of the Contract Documents in order to accommodate their use.
C. Section 01100 substitutions / alternates is not submitted

1.15 Preconstruction Conference: Before beginning work at the site, the General Contractor shall attend a preconstruction conference and shall bring with him/her the Superintendent employed for the duration of the project. Also, instruct the plumbing, mechanical, and electrical subcontractors or their representatives to attend this meeting. At this time, all the parties concerned will discuss the project under Contract and will prepare a program of procedure in keeping with the requirements of the Drawings and Specifications. The

SECTION 01410 - PROCEDURES AND QUALITY CONTROL

Superintendent shall henceforth make every effort to expeditiously coordinate all phases of the work, including the required reporting procedure, to obtain the end result within the full purpose and intent of the Drawings and Specifications for the project.

1.16 Project Sign: Not Required

1.17 Warranties: Except as otherwise specified, all work shall be warranted by the Contractor against defects resulting from the use of inferior materials, equipment or workmanship for one year from the date of final completion of the Contract, or from full occupancy or use of the project (for which it was designed) by the Owner, whichever is earlier.

1.18 If, within any warranty period, repairs or changes are required in connection with the warranted work, which in the opinion of the Architect/Engineer, are rendered necessary as the result of the use of the materials, equipment or workmanship which are defective or inferior or not in accordance with the terms of the contract, the Contractor shall, promptly upon receipt of notice from the Owner, and without expense to the Owner, proceed to:

A. Place in satisfactory condition, in every particular, all of such warranted work, and correct all defects therein.

B. Make good all damage to the structure or the site, or equipment or contents thereof, which, in the opinion of the Architect/Engineer, is a result of the use of materials, equipment of workmanship which are inferior, defective, or not in accordance with the terms of the Contract.

C. Make good any work or materials, or the equipment and contents of structures or site, disturbed in fulfilling any such warranty.

D. If the Contractor, after notice, fails to proceed promptly to comply with the terms of the warranties, the Owner may have the defects corrected; and the Contractor and his/her surety shall be liable for all expenses incurred.

E. The date of Substantial Completion issued by the Architect will be the date the warranties will commence. If a product is replaced for any reason the new date of that item's warranty will begin when that item has been successfully installed and found to be in working order.

1.19 Supervision: General Contractor is to have a Superintendent, employed by him throughout the duration of the project, present at work areas whenever any subcontractors', as well as, Contractor's personnel are working, unless other arrangements are agreed to with Owner. Supervision by General Contractor of all work under this Contract is mandatory.

1.20 The Contractor shall furnish sufficient forces, construction plant, and equipment and shall work such hours, including night shifts and overtime operations, as may be necessary to ensure the procession of the work and to complete the work within the specified time. The Contractor shall take such steps as may be necessary to improve his/her progress by increasing the number of shifts, overtime operations, days of work, and the amount of construction plant, all without additional cost to the Owner.

1.21 Failure of the Contractor to comply with the requirements under this provision shall be grounds for determination by the Architect that the Contractor is not prosecuting the work with such diligence as will ensure completion within the time specified, and such failure constitutes a substantial violation of the Agreement.

SECTION 01410 - PROCEDURES AND QUALITY CONTROL

1.22 Upon such determination, the Owner may terminate the Contractor's right to proceed with the work, or any separable part thereof, in accordance with Article 14 of the AIA General Conditions.

(END OF SECTION 01410)

SECTION 01500 - TEMPORARY FACILITIES (To be coordinated with Owner)

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 Temporary Storage Sheds: The Contractor may provide on-premises at convenient location with respect to building construction areas, suitable watertight storage sheds for storage of materials, equipment, and tools which might be damaged by exposure to the weather and job site telephone. Sheds shall be of sufficient size and capacity to hold all damageable materials that may be on site at one time. Floors shall be raised at least six inches above the ground and be supported by heavy joists or sleepers. Contractor shall maintain sheds in good condition and shall relocate same from time to time as necessary where preliminary location might interfere with subsequent work. Remove sheds when no longer needed.

1.03 Temporary Toilet Facilities: The Contractor shall furnish, install, and maintain ample sanitary facilities for use of workmen of all trades engaged in work under the Contract. Portable facilities shall be used. Temporary toilets shall be constructed at time work is commenced and shall be subject to applicable City Ordinances, Health Department requirements, and rules and regulations of governing authorities by code or otherwise. [Note: Owner may allow use of toilet facilities in the existing adjacent facility after project has been awarded.]

1.04 Temporary Utilities:

A. Arrangement and Payment - The Owner may furnish accessibility to water and electrical power free of charge to the Contractor from adjacent existing facility. The Contractor shall make all necessary arrangements and shall pay for sewage service and removal of rubbish and debris during the construction of the buildings as may be required for use of his own forces and those of his/her Subcontractors, and as required by them until acceptance of the work by the Owner.

B. Water - The Owner will have water service adjacent to the construction site for the Contractor's use. Contractor is to provide all hoses and piping required for construction.

C. Electrical - The Owner will provide electric service and Contractor to furnish extension cords to area needed. The Contractor shall provide wiring, fuses; disconnect switches, safety devices, junction boxes, panel boxes, ground fault protections, and transformer, if required, in connection with use of temporary electrical service for lighting and power during construction. All items and installations are to conform to the requirements of the National Electrical Code, and "Occupational Safety and Health Act of 1970." Observations by the Architect, his agents, or any recognized agency indicating failure to comply with code requirements shall be cause for immediate suspension of the job site operations by the contractor until the system is in full compliance. No extension to the contract time shall be allowed for such suspension of job site operations.

D. All temporary water and electrical connections, if needed, shall be made at locations and in a manner approved by the Owner. These services shall be maintained in a safe condition. All temporary services, if needed, shall be completely removed and all disturbed work returned to its as found condition, when the services are no longer needed.

SECTION 01500 - TEMPORARY FACILITIES (To be coordinated with Owner)

1.06 Public Protection: The Contractor shall provide applicable temporary public protection facilities and precautions to avoid damage to persons and property including streets, utilities, and adjacent private and public property. Compliance with “Occupational Safety and Health Act of 1970" Federal Statute, and Part 1926, “Safety and Health Regulations for Construction”, published by the Associated General Contractors of America is required. The Contractor shall minimize delivery of construction materials and heavy traffic to and from the site during one critical hour when occupants are arriving and leaving the site. The Owner will advise the Contractor of the times at the Preconstruction Meeting.

1.07 Fire Hazards: The Contractor shall observe and enforce compliance by all trades engaged in work under the Contract with requirements of city, county, state, federal, and Insurance Underwriter’s regulations to minimize fire hazards incidental to the work.

1.08 Watchman and Janitor Service:

A. Watch Requirements - The Contractor may employ and pay for watchmen, or a watchman’s service, as he/she deems necessary to protect his/her own interest, and he shall be responsible for and pay for losses or damages to the Owner’s materials or other property as a result of theft, mysterious disappearances, or intrusions by strangers.

B. Janitorial Requirements - The Contractor shall keep sanitary facilities clean and supplied, dispose of waste, attend to drinking water requirements, and render such other housekeeping or janitorial services as may necessary to keep job office, job site, the work and temporary toilets clean and in first class conditions.

(END OF SECTION 01500)

SECTION 01530 – BARRIERS (If required for Safety)

1.0 GENERAL

1.01 Summary: It is the intent of this section to provide for the furnishing, erecting, providing and installing of all protective barriers to prevent harm to workmen or students by adequately marking and designating work areas that may be cause of such harm and to adequately mark those areas containing stored materials to prevent damage.

1.02 Description:

A. Erect barriers around areas of construction to warn all persons of the possible hazards of personal injury when entering such areas. Erect barricades around open holes and work edges or other such items which may, because of location of work areas or type of work, because of injury or harm to any person within construction areas.

B. Erect barriers around existing planting areas to protect landscaping plants from damage due to construction operations, storage of materials and abuse by workmen.

C. The Contractor shall erect barriers or fences to protect materials stored on-site and to prevent children from playing on stored materials and equipment.

2.0 PRODUCTS

2.01 Barriers:

A. Barricade may be portable, prefabricated types or erected and fabricated on-site of wood or rope and chains.

1. Signs:
   a. Post at not more than 12 feet apart and attached to barricade.
   b. Attach signs stating "Danger" or "Do Not Enter".
2. Flags: post red colored flags at not more than 6 feet apart.
3. Barricades:
   a. Each barricade type shall meet OSHA standards.
   b. OSHA standards exceed all other type barricades listed herein.

B. Landscaped Areas: Erect barriers to prevent workmen from entering or storing materials in planting areas.

3.0 EXECUTION

3.01 Barriers shall remain in place during entire construction operations, from demolition until substantial completion.

3.02 Barrier locations will be determined on the plan sheet as approved by Project Manager/Architect/Engineer and will be discussed at the Pre-construction Meeting.

3.03 Barriers shall be removed at completion of all construction operations.

(END OF SECTION 01530)

SECTION 01560 - TEMPORARY CONTROLS

1.0 GENERAL

1.01 The General Provisions of the Contract, including the General Requirements, Supplementary Conditions, and Special Conditions, (if any), along with the General Requirements, apply to the Work specified in this Section.

1.02 In addition to the controls specified elsewhere in this Specification, the Contractor shall maintain control of the construction site and environmental effects which are present during construction.

1.03 The Contractor shall maintain controls over noise, dust, water, pests and rodents, and pollution sources present during construction to locally acceptable levels.

1.04 Debris Control: The Contractor shall keep the building, site, and adjacent properties, free from the accumulation of construction debris during the life of the construction project. Clean and remove debris at least once a week.

1.05 Protection: Adequate protection measures shall be provided to protect all workmen and passers-by. Street and adjacent property shall be duly protected throughout the work. All remaining trees and plants shall be carefully protected from damage. Shoring, sheeting and bracing shall be provided to prevent caving, erosion or gullies of sides of excavations.

(END OF SECTION 01560)

SECTION 01620 - MATERIALS, STORAGE AND PROTECTION

1.0 GENERAL

1.01 All materials shall be new and delivered to the site in original manufacturer's or fabricator's bundles, packages, containers, etc. and tagged or otherwise marked or labeled for proper identification.

1.02 Store all materials in appropriate manner from elements and weather off ground, under cover or in enclosures as required by manufacturer's recommendations, code or trade association recommendations.

1.03 Ventilate enclosed or covered areas to prevent moisture damage to materials.

1.04 Do not allow materials to become unusable by contamination from foreign matter, frost, ice, rust, corrosion, etc.

1.05 Obtain all similar types of materials or products form single manufacturer, produced by similar or duplicate methods. Do not change sources or brands during the course of the work unless approved by the Architect/Engineer.

1.06 Contractor is to coordinate sidewalk closure, if necessary, to accommodate loading and unloading of materials and temporary storage of construction dumpster. Contractor is to ensure that any construction related work is secured and fenced from the public with all necessary flagging, warning signage, and safety measures in place at all times.

2.0 PRODUCTS

2.01 As required by specifications.

3.0 EXECUTION

3.01 Inspect all materials and products prior to installation or incorporation into the work.

3.02 Do not install materials or items which are damaged or otherwise not acceptable. Acceptance of project is contingent upon all items or materials being in proper operating condition and free from defects, blemishes or damage.

3.03 Install all items specified or referenced by specification in locations and manner shown or required. Proprietary items shall be installed in manner and under conditions recommended by the manufacturer.

(END OF SECTION 01620)

SECTION 01700 - CLOSE-OUT REQUIREMENTS

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 Description of Work: As each scope of work is completed and prior to the Architect's semi-final inspection, the following cleaning shall be done:

A. Completely clean the entire area of dust.

B. Remove any paint spots.

C. Clean and polish finish metal, if affected by this scope of work.

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1.03 After the work is occupied by the Owner, it is not the Contractor's responsibility to do further cleaning; however, before final acceptance, clean or otherwise repair any damage, or soiling of finish materials that can be attributed to the Contractor's workmen.

1.04 Record Drawings: Each day during the progress of the work, the Contractor shall require the job superintendent for the plumbing and electrical subcontractors to record, on their field sets of drawings the exact locations, as installed, of all concealed conduit, pipe, and equipment which were not installed exactly as shown on the Contract drawings.

1.05 With reference to electrical work, the exact runs of concealed conduit shall be shown on these drawings.

1.06 The Contractor shall review the completed record drawings and shall ascertain that all data furnished on the drawings is accurate and truly represent the work as actually installed.

1.07 The prints, including those unchanged and changed, shall be submitted to the Architect when completed, for certification and forwarding to the Owner at the time of Substantial Completion.

1.08 Close-Out of the Work: The following items cover the conditions necessary to the completion of the project. As-builts are to be provided in the most recent CAD file, or reproducible, as directed by Architect at project closeout. Contractor may elect to sub out CAD work or retain the services of the Architect and Engineer of Record to perform all CAD work to incorporate all field modifications during construction as part of the final project close-out.

A. Basic Requirements Prior to Final Inspection - Upon substantial completion of all General Construction, and prior to the Architect's punch list inspection, complete all of the following:

1. General Construction.
2. Mechanical and electrical work if altered, with fixtures in place, connected Temporarily, if necessary, cleaned and ready for final tryout and test.
3. Painting and finishing.
4. Cleaning of all work.
5. Clear grounds of the Contractor's shacks, equipment, fences, and building

SECTION 01700 - CLOSE-OUT REQUIREMENTS

supplies.

6. Closeout Documents and Construction Documentation with electronic CAD file.

B. Contractor's Semi-Final Inspection - When work is substantially complete, as defined by the General Conditions, Contractor/Construction Manager is to make an inspection of the entire work and, with the assistance of all subcontractors, make a detailed list of all items still to be completed. Then request payment for substantially completed work as provided for under the paragraph pertaining to payments in the General Conditions and in Supplementary Conditions. Along with this request, submit to the Architect two copies of the list of items to be completed. Architect and Engineers will inspect or review the work or submittals two times only as part of his/her Contract to identify minor project deficiencies. A/E will not provide extensive or exhaustive inspections of incomplete or incorrect work without reimbursement for additional services.

C. Architect's Semi-Final Punch List - Upon receipt of the above written request and information from the General Contractor, the Architect will make a detailed semi-final inspection of the work. If the Architect finds the work to be substantially complete, he will prepare a Certificate of Substantial Completion for payment by the Owner and will attach thereto the punch list of items to be completed or corrected. This list may not be exhaustive, and failure to include an item on it does not alter the responsibility of the Contractor to complete all work in accord with the Contract Documents, including authorized changes thereto. If the Architect does not concur in the Contractor's claim of substantial completion, he will so notify the Contractor and will state his reasons for his decision and terminate the inspection. The Contractor shall thereafter take steps to correct the deficiencies and to bring the work to substantial completion, after which he will repeat the same process.

D. Contractor's Request for Final Payment - With the request for final payment, submit a copy of the latest punch list with all completed items checked off. If any items on the punch list are not checked off, explain their status and when they can be expected to be completed or corrected. In addition, the Contractor is to submit complete and accurate closeout documents. When project is deemed complete, the Architect is to issue a Certificate of Final Inspection.

E. Items Required to Issuance of Final Certificate - As the punch list of uncompleted or uncorrected items is completed, submit the following to the Architect for his approval:

1. Warranties - Furnish all manufacturers' warranties which have been included with equipment. Date of warranty is to reflect date of Certified Substantial Completion or in the case of replacement material or parts, the date the equipment/material has been successfully placed in service.

2. Guarantees - Furnish written warranties, in DUPLICATE, signed by the subcontractor and the General Contractor, in accordance with the owner's front-end requirements, if none are provided refer to para.4.5 of the AIA General Conditions and with Supplementary Conditions and Technical Specifications.

SECTION 01700 - CLOSE-OUT REQUIREMENTS

3. Final Releases of Lien - Furnish affidavits and Final Releases of Lien in addition to the owner provided front-end requirements if none are provided refer to sub-para.9.9.2 of the AIA General Conditions.
4. One complete copy of shop drawings.
5. Date of post-occupancy, pre-one-year site inspection (roughly two to three weeks prior to the one-year general warranty anniversary).
6. All test certifications.

F. Final Payment: Upon receipt of the above-listed documents and information, the Architect will make a final inspection of the project. If all punch list items are complete or corrected, the Architect will issue a final certificate to the Owner, recommending that final payment be made. The final payment will be withheld, however, until after the final inspection and approval by the Owner.

G. Project Closeout Documents Checklist: See attached form.

SECTION 01700 - CLOSE-OUT REQUIREMENTS

PROJECT CLOSE OUT DOCUMENTS

(Contractor to provide items applicable their work effort and as required by Owner)

____ Completed Checklist of Unconditional Release of Liens (Attach) for each construction participant participating in this project

____ As Built Drawings (Hard Copy and Two copies of scanned drawings on a computer disk)

____ Electronic file of As-Built conditions

____ Warranties as Appropriate (Dated to reflect substantial inspection date, or replacement date)

____ Owner's Manuals for All Equipment/Project

____ Certification that the Punch List Is Completed
(Verified and Signed by contractor/ representative of owner)

____ A Copy of Each Shop Drawing

____ Letter stating No Lead or Asbestos Related Products were used on the Project

OWNER _____ ARCHITECT_____

DATE _____

(END OF SECTION 01700)

SECTION 01710 – CLEANING

1.0 GENERAL

1.01 Description of Work:

A. Work includes, but is not limited to, cleaning of materials and work of all Specification Sections, removal of trash, debris, and waste materials and preparation of building for occupancy.

B. Maintain premises and public properties free from accumulation of waste, debris, and rubbish caused by work operations.

C. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces. Leave project and premises clean and ready for occupancy.

2.0 PRODUCTS

2.01 Use only cleaning materials recommended by manufacturers and only as directed by manufacturers.

A. Take proper precautions to prevent damage by spillage of caustic, acidic, toxic or volatile cleaning material:

1. Keep and store all cleaning materials, compounds, or solutions in covered metal or other suitable safe containers and keep in a safe, locked storage area when not in use.
2. Notify authorities when any toxic substances shall be used so as to provide proper notice to teachers and students to prevent any contamination by inhaling, touching, or tasting or any other contact which may cause illness or reaction to the toxic substance.

B. Clean and remove any spilled cleaning materials. Repair or replace damaged materials due to spilled cleaning materials.

C. Do not dispose of any cleaning materials, compounds, or solutions into sanitary lines, storm drains, or on-site pits. Dispose of as prescribed by Law.

3.0 EXECUTION

3.01 During Construction:

A. Execute cleaning to ensure that building, grounds, and public properties are maintained free from accumulations of waste materials and rubbish. Wet down dry materials, and rubbish to lay down dust, and prevent blowing of dust. Periodically, during progress of work, remove accumulations of waste, debris, and trash.

B. Provide on-site containers for collection of waste materials, debris, trash, and rubbish on a regular basis.

C. Do not bury any waste materials, debris, trash, and rubbish on site.

D. Remove waste materials, debris, trash, and rubbish from site and legally dispose of at legal dumping areas designated by law.

E. Handle waste materials, debris, trash, and rubbish from site and legally dispose of at legal dumping areas designated by Law.

F. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process and operations will not fall on or damage newly painted surfaces or other work that would be damaged.

G. Do not encumber site with waste material accumulations. Keep walkways free of all waste.

H. Do not burn without burn permit from proper authority with the location determined

SECTION 01710 – CLEANING

by the Project Manager or Architect/Engineer.

3.02 Final Cleaning:

A. Remove grease, dust, dirt, stains, labels, and other foreign materials from exposed interior and exterior surfaces. Repair, patch, and touch-up marred surfaces. Broom clean paved surfaces. Rake clean grounds.

B. Dispose of trash, waste, debris and rubbish from site.

C. Maintain building and grounds in clean condition until acceptance by Owner.

(END OF SECTION 01710)

SECTION 02000 – SUBSURFACE CONDITIONS / GEOTECHNICAL

1.0 GENERAL

1.01 DESCRIPTION

A. Prior to the completion of these construction documents timing would not allow for a geotechnical investigation. It is assumed ideal soil conditions at this location are based on adjacent prior area construction. Prior to commencement of work the contractor shall authorize as part of the scope-of-work a geotechnical investigation consisting of two 20'-0" deep boring identifying soils, seasonal high water, and bearing capacity to confirm the assumption of ideal bearing conditions. If exporting and importing of soils are required refer to section 1026, guidance in unit pricing..

B. This Geotechnical assumption of ideal conditions is for reference only and information is provided as a convenience to the Contractor for the pricing of the proposed building only, and expressly not as a part of the Contract Documents. Once awarded the contractor to engage a Geotech engineer to provide a two boring Geotech investigation.

C. Actual subsurface conditions which may be encountered in connection with this Project may vary, and any information or conclusions drawn from this Contractors Geotechnical Report shall be at the Contractor's risk.

D. Not Owner, Architect nor any of their respective consultants, agents, or employees makes any promises, representations, or guarantees as to the accuracy of the Geotechnical information referenced herein.

(END OF SECTION 02000)

SECTION 02070 - DEMOLITION

1.0 GENERAL

1.01 Summary: It is the intent of this section to provide the demolition of materials and work to be removed as preparation to installation or alterations for new work or materials and, if necessary, removal of ill-timed installations of new materials to provide for inspections.

1.02 Work Included:

A. Work included is a convenient listing of the significant items described within this section and shall not be construed as the only work applicable or related to this section.

B. Work includes, but is not limited to, performing alterations, demolition, removal and related work which is shown on the Drawings, specified herein, or implied by the characteristics of the extent of the work and necessary for the installation of new work.

C. Work of Other Sections - Disconnect, remove, repair, extend or relocate existing mechanical, electrical or piping work to include, but not limited to, equipment, conduit, fixtures, or piping.

D. Reusing Existing Materials - Materials removed from existing work, if suitable and approved by the Architect, may be reused in new work.

1) Existing materials for reuse in unexposed work shall be substantial enough to produce the strength, suitability, and other characteristics and properties as that of new materials.

2) Existing materials for reuse in exposed work shall be capable of, and suitable for, being refinished to match new work as well as to produce the strength, suitability and other characteristics and properties as that of new work.

E. Salvage of Existing Work:

1) Existing work designated on the Drawings or specified herein to be reused with new work shall be carefully removed, protected, stored, and re-installed.

2) Existing work designated to be salvaged for Owner’s reuse elsewhere shall be carefully removed, protected, and stored as directed by the Owner.

F. Existing Utilities:

1) Do not disconnect or interrupt utilities without prior notice to the Owner 48 hours before commencing work.

2) Provide protection of existing utilities during demolition and construction.

G. Right of Refusal:

1) Owner reserves the first right of refusal for all salvageable material or equipment. If exercised, contractor to neatly stack and store material in an area directed by the owner for their removal.

1.03 Scheduling:

A. Consult with and obtain Owner’s approval before commencing alterations or demolition work.

B. Consult with and obtain Owner’s approval before discontinuing or disrupting existing mechanical, power, or water service.

1.04 Protection:

A. Make such explorations, inspections and probes necessary to determine protective measures required prior to demolition and removal.

B. Provide and erect shoring and bracing necessary to prevent damage to existing construction.

SECTION 02070 - DEMOLITION

C. Provide and maintain weather protection necessary at exterior openings to fully protect interior spaces from damage until openings are closed by new construction.
D. Provide and maintain temporary protection of existing structure designated to remain where demolition, removal and new work is being done.
E. Prevent dirt and dust from rising by wetting demolished materials and similar debris.
F. Contractor to be responsible for any damage or abuse to existing structure, contents, or site elements due to insufficiency of protection or carelessness of workmanship.

1.05 Workmanship:

A. Perform demolition, removal, and alteration work required with due care and precaution.
B. Demolish work in small sections and install temporary shoring and bracing where necessary to prevent collapse of any construction.
C. Where alterations occur, or new and old work adjoin, cut remove, patch, repair and refinish adjacent surfaces, or as much required by involved conditions, and leave in as good a condition as existed prior to beginning work.
D. Finish new and adjacent surfaces as specified.
E. Repair existing equipment or fixtures to be reused and refinish to put in good working order.
F. Materials and items to be salvaged by the Owner shall be removed with due care and disposed or stored as designated by the Owner.
G. Materials and items to be reinstalled shall be removed with due care under supervision of trade responsible for reinstallation and protected and stored until required. Replace items or material damaged by removal with similar new material.
H. Materials and items demolished and not designated to be salvaged by the Owner or reinstalled shall be removed from the site.
I. Execute work in a careful and orderly manner.
J. Remove debris and maintain work areas in neat and clean condition.
K. If roof modification of any level is required, work is to be completed by manufacturer approved roofing contractor to preserve the existing roof system warranty. Confine cutting of existing roof areas designated to remain to limit required for proper installation of new work. Provide temporary weather tight protection as required until new roofing and flashings are installed.

(END OF SECTION 02070)

SECTION 02120 – CLEARING AND GRUBBING

1.0 DIRECT PURCHASING

1.01 This Section is subject to the terms described in Section 01042, Direct Purchasing Procedures, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding materials purchases or installation, with the exception of the payments for the materials as purchased.

2.0 GENERAL

2.01 Description: Remove all trees, logs, stumps, shrubs, brush, vegetation, excessive organic material, debris, existing foundations, pavement, structures, fences, and other items that would interfere with construction operations.

2.02 Protection:

a. Adequate protection measures shall be provided to protect all workmen and passersby. Streets and adjacent property shall be duly protected throughout the work.

b. Trees or plants that are indicated on the drawings to remain shall be adequately protected during construction.

c. Existing utilities and drainage line shall be protected from damage and, if damaged, replaced or repaired by the Contractor at his expense. If live utilities lines are encountered, the Contractor shall take whatever steps are necessary to insure that the service is continued or immediately restored at no additional cost to the Owner.

2.03 Related Documents: The General Provisions of the contract including the general conditions, supplementary conditions, and general requirements apply to the work specified in this section.

3.0 PRODUCTS

3.01 Topsoil material removed from the surface of the site shall be stockpiled and reused at other locations on the site as directed by the Engineer.

3.02 All clearing and grubbing material or refuse other than topsoil shall become the property of the Contractor and shall be removed from the property.

SECTION 02120 – CLEARING AND GRUBBING

4.0 EXECUTION

4.01 Clear and grub within the limits shown on the drawings. In areas marked for “Selective Clearing,” remove only underbrush, trees, and shrubs smaller than 4” caliper, and trees not flagged by the Owner for protection.

4.02 Grubbing:

a. Remove all stumps, roots over one inch (1") in diameter, and matted roots to the following depths:
   1. Footing, slabs on grade, bottom slabs of structures: 18"
   2. Walks: twelve inches (12").
   3. Roads and Parking Areas: 18".
   4. Areas to be Grassed or Landscaped: six inches (6").
   5. Fills: twelve inches (12").

b. In the case of footings, slabs on grade, bottom slabs of structures, roads and parking areas, or other construction on fills, the greater depth shall apply.

c. Unless further cut is required, fill depressions made by grubbing and compact to density of surrounding soil.

d. The debris shall be disposed of at an off-site location to be provided by the contractor. Temporary earth spoil-banks shall not obstruct drainage or damage trees or vegetation. All debris and surplus materials shall be removed from the site prior to final inspection.

e. Debris may be burned on-site only with a valid permit, subject to the terms of the permit and only if no state, county or local ban is in effect.

(END OF SECTION 02120)

SECTION 02137 – EROSION AND SEDIMENTATION CONTROL

1.0 DIRECT PURCHASING

This Section is subject to the terms described in Site Civil Drawings under separate cover.

2.0 GENERAL

2.01 Description: The Contractor shall perform all work in a manner consistent with the Water Management District permit and best management practices for control of erosion and sedimentation in all areas of the project site. Only general indication of minimal measures to be taken is illustrated on the Plans. The Contractor is solely responsible for repairs, damages, and fines for onsite and offsite erosion, turbidity and deposition of sediment which arise from his operations.

2.02 Workmanship: Prior to commencing any disturbance of pervious surfaces, the Contractor shall install facilities to prevent sediment and turbidity which may arise in the work area from leaving the site. Additions to those facilities shall be made as the progress of the work dictates. Newly installed and existing pipes shall be protected from siltation. Disturbed surfaces shall be temporarily grassed as soon as work ceases in that portion of the work area.

2.03 Cleanup: During the course of the work, deposits of sediment shall be removed whenever the deposit exceeds one-half the height of the protective device. Upon completion, all temporary facilities shall be completely removed and the areas dressed in a workmanlike manner. Pipes which are part of the affected systems shall be cleaned of all sediment. Grassed areas shall be maintained until a permanent stand of grass is established.

(END OF SECTION 02137)

SECTION 02220 - EXCAVATION & BACKFILL, SOIL COMPACTION & GRADING

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 Description of Work: The work covered by this Section shall include all materials, equipment, labor and supervision necessary for the excavation, separation of suitable and unsuitable fill, soil compaction, filling and grading.

1.03 Quality Assurance:

A. Work shall conform to National, State, County, City, and Institutional codes governing installation of site utility systems.

B. Required testing shall be performed by an independent testing laboratory in accordance with *Section 01400 - Testing*.

1.04 Geotechnical Investigation and Recommendations: Soil Borings and Geotechnical Reports and recommendations are to be provided by Contractor prior to commencement of work. Since this project is an addition to an existing building and no evidence of unsuitable substrate conditions are evident, it is assumed subsurface soil conditions are reasonable and assumed for Architectural / Engineering design efforts. Data indicated on the construction drawings relating to the subsurface conditions are not intended as representations or warranties of accuracy or continuity throughout the site. The Contractor shall make additional site investigations as he/she determines necessary in order to prepare satisfactory construction means and methods that reflect site-specific conditions.

1.05 Job Conditions:

A. Contractor shall take the necessary actions to comply with all provisions of the "Trench Safety Act."

B. All open excavations shall be barricaded and posted with warning lights as recommended by authorities having jurisdiction.

C. When excavation has reached required subgrade elevations, notify Architect and Testing Company who will make an inspection of condition. If it is determined that bearing materials at required subgrade elevations are unsuitable, continue excavation until suitable bearing materials are encountered and replace excavated materials as directed by Architect. The contract sum may be adjusted by an appropriate Contract modification.

2.0 SITE PREPARATION

Assuming ideal or reasonable site conditions, we recommend normal, good practice site preparation procedures. These procedures include: stripping the site of existing vegetation and topsoil, compacting the subgrade and placing necessary fill or backfill to grade with engineered fill. We recommend that the bottom of all footings be probed as to confirm the suitability of the bearing soils. A more detailed synopsis of this work is as follows:

2.01 Prior to Construction, the location of any existing underground utility lines within the construction area should be established. Provisions should then be made to relocate interfering utilities to appropriate locations. It should be noted that if underground pipes are

SECTION 02220 - EXCAVATION & BACKFILL, SOIL COMPACTION & GRADING

not properly removed or plugged, they may serve as conduits for subsurface erosion which may subsequently lead to excessive settlement of the overlying structure.

2.02 If required, perform remedial dewatering prior to any earthwork operations. Dewatering operations scheduled immediately adjacent to existing structure footings should be carefully evaluated for possible impacts to the existing foundation systems. Dewatering systems should not be decommissioned until the excavations backfilled two feet above the groundwater level at the time of construction. Further, the site should always be graded to prohibit ponding of stormwater runoff.

2.03 Where cut operations must extend below the existing buildings' foundation bearing elevations, and extend laterally within five feet of the same existing foundations, the stability of the existing foundations should be verified by the Contractor's Geotechnical engineering service and if necessary, the Architect and Structural Engineer of record. If excavation extends below an imaginary plane projecting downward at 1:1 (horizontal to vertical) from existing foundations, the existing foundations should either be underpinned or shoring should be designed to keep settlements of the foundations within acceptable limits. The design and installation of all necessary underpinning and shoring would be the responsibility of the contractor.

2.04 As a prudent measure, we recommend that a pre-construction survey of the existing structures be performed to assess those buildings for current architectural and structural distress, as may be evidenced by exterior/interior vertical and horizontal surface cracking, unusual separation of building elements, and out-of-level conditions. The preconstruction survey results would provide a baseline for comparison and decision making during the building addition construction process.

2.05 We recommend that existing structures in close proximity to the proposed building addition should be monitored for cracks or signs of distress during adjacent new excavation and building construction operations.

2.06 Strip the proposed construction limits of all grass, roots, topsoil, and other deleterious materials within 5 feet beyond the perimeter of the proposed area. Expect typical stripping at this site to depths of 6 to 12 inches. Deeper clearing and grubbing depths may be encountered in heavily vegetated areas.

2.07 Following site clearing, grubbing and rough grading, the same project areas should be proof-rolled using a large, fully loaded rubber-tired vehicle (dump truck) or similar equipment. Proof-rolling will help locate any surficial zones of especially loose or soft or unsuitable soils not encountered in the soil test borings, and should help provide more uniformity in the sandy subsurface soil profile. Unusual or unanticipated conditions identified during this process must be immediately brought to the attention of the Contractor provided Geotechnical Engineer and the Architect / Structural Engineer. Field density testing is not required during proof-rolling operations unless required by Contractor's Geotechnical engineering service.

2.08 Weak subgrade soils identified during proof-rolling operations should be excavated and removed from the site, and replaced with granular fill soils. We recommend that the bottom of all footings be probed so as to confirm the suitability of the bearing soils. Granular soils used for this purpose should meet the material and placement specifications outlined below.

2.09 Excavate the site to the proposed grades. Stockpile the surficial sandy soils for later use as

fill. Proof-rolling operations should be followed by backfill compaction operation. Compaction operations should be implemented with a compactor of appropriate size and must be used in static mode. Backfill compaction should be performed until an in-place soil density of 95 percent minimum of the Modified Proctor maximum dry density (ASTM D-1557) is achieved to a depth of 2 feet below the final subgrade, or foundation bearing elevations, whichever is greater. If necessary to achieve the recommended soil compaction at depth, the entire project area may be undercut, the exposed subgrade soils compacted, and then the areas backfilled using 6-inch lifts to final subgrade elevation. The subgrade beneath slabs should be compacted to a depth of 1 foot below the beginning grade prior to placing fill.

2.10 Compaction operations should extend to the limits of the cleared/grubbed project areas. Compaction of the existing, near-surface sandy soils will provide for uniformity of foundation/slab settlements and improve the soils' bearing capacity conditions. Typically, the soils should exhibit moisture contents within ± 2 percent of the modified Proctor optimum moisture content during compaction. A minimum of eight (8) complete coverages (in perpendicular directions) should be made in the building area with the roller to improve the uniformity and increase the density of the underlying sandy soils. It should be anticipated that moisture will need to be added to the subgrade inorder to achieve the required compaction.

2.11 Should the bearing level soils experience pumping and soil strength loss during the compaction operations, compaction work should be immediately terminated and (1) the disturbed soils removed and backfilled with dry structural fill soils which are then compacted, or (2) the excess pore pressures within the disturbed soils allowed to dissipate before recompacting.

2.12 Care should be exercised to avoid damaging any nearby structures while the compaction operation is underway. Prior to commencing compaction, occupants of adjacent structures should be notified and the existing conditions of the structures be documented with photographs and survey (if deemed necessary). Compaction should cease if deemed detrimental to adjacent structures. Contractor may retain the services of a Geotechnical engineering service to provide vibration monitoring services to help document and evaluate the effects of the surface compaction operation on existing structures. In the absence of vibration monitoring it is recommended the vibratory roller operating in the static mode is recommended.

2.13 Place fill material as required. Offsite fill material should contain less than 10 percent passing the No. 200 sieve. Place backfill and fill in uniform 10-to-12 inch loose lifts and compact each lift to a minimum density of 95 percent of the modified Proctor maximum dry density. Each lift should be compacted and have density test results that verify the level of compaction is satisfactory before the next lift is placed.

2.14 Perform compliance tests within the fill/backfill at a frequency of not less than one test per 2,500 square feet per lift in the structure areas, or at a minimum of three tests per structure area, whichever is greater. Additionally, we recommend that you test every other column footing, and one test per every 50 lineal feet of wall footing. Footings should be visually inspected and probed with a static cone penetrometer to verify stability.

(END OF SECTION 02220)

SECTION 02225 - EXCAVATION AND BACKFILL - UTILITIES

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 Description of Work: The work covered by this Section shall include all materials, equipment, labor and supervision necessary for the excavation, separation of suitable and unsuitable fill, soil compaction, filling and grading.

1.03 Quality Assurance:

A. Work shall conform to National, State, County, City, and Institutional codes governing installation of site utility systems.
B. Test required shall be performed by an independent testing laboratory.

1.03 Job Conditions:

A. Contractor shall take the necessary actions to comply with all provisions of the "Trench Safety Act."
B. All open excavations shall be barricaded and posted with warning lights as recommended by authorities having jurisdiction.
C. When excavation has reached required subgrade elevations, notify Architect and Testing Company who will make an inspection of condition. If it is determined that bearing materials at required subgrade elevations

2.0 MATERIALS

2.01 Granular Fill:

A. Sand: Clean, naturally-occurring sand, free of roots, rocks, clump, organic matter, or other materials exceeding 3/4-inch diameter.
B. Excavated or Borrow Sub-Soil: Free from roots, rocks larger than 3-inches in diameter and building debris, capable of being compacted to densities and achieving LBR's as shown on the approved plans.

3.0 EXECUTION

3.01 Preparation:

A. Prior to work of this Section, Contractor shall carefully inspect installed work of other trades and verify that such work is complete to a point where this installation may properly commence.
B. Verify that items may be installed in accordance with the original design, codes and regulations, and portions of references standards.
C. In the event of a discrepancy, immediately notify the Architect.
D. Do not proceed with installation in areas of discrepancy until such discrepancy has been fully resolved.
E. The locations of sewers, conduits and structures, as indicated on the drawings, have been selected to provide the service intended. The Architect reserves the right to make minor variations in the location of these items during construction.

3.02 Control Surveys: Contractor shall have the lines and grades surveyed as may be necessary for the proper control of work. Verify benchmark elevations against existing benchmarks.

SECTION 02225 - EXCAVATION AND BACKFILL - UTILITIES

3.03 Excavation and Preparation of Trench:

A. The trench shall be dug so that the pipe can be laid to the alignment and depth required, and it shall be excavated only so far in advance of pipe laying as required to ensure continuous installation.

B. The trench shall be so braced and drained that the workmen may work therein safely and efficiently.

C. Safety at the work site is the responsibility of the Contractor. All open trench cuts shall be sheeted and braced as required by OSHA or other governing law or ordinance or as required to protect the workmen or the work. The Architect may permit alternate trench protection or required protection in addition to that intended by the Contractor.

D. Trenches shall be excavated to the required depth and to a width sufficient to provide adequate working space. When required the trench shall be of extra width to permit the convenient placing of supports, sheeting and bracing, or other special items. Trench width below pipe-crown shall not exceed the outside diameter of pipe plus 2-feet.

E. The trench shall be excavated to the depth required to provide uniform and continuous bearing and support for the pipe at every point between bell holes.

F. Bell holes shall be provided at each joint to permit the jointing to be properly installed.

G. All parts of the bottom of trench excavated below the specified grade shall be backfilled with approved material thoroughly compacted as directed by the Architect.

H. Where the bottom of the trench is found to contain unsuitable material, in the opinion of the Architect, such material shall be removed to the width and depth ordered by the Architect.

I. Before the pipe is laid the subgrade shall be made by backfilling with at least 6-inches of approved bedding material.

3.04 Removal of Water: Contractor shall provide equipment as necessary to keep the work area free of standing water.

3.05 Disposal of Unsuitable and Surplus Material: All materials excavated which are deemed unsuitable for use in backfilling trenches or around structures or suitable materials excavated that are in excess of that required shall be disposed of in the areas directed by the Architect.

3.06 Explosives: No explosive or blasting caps shall be brought on site.

3.07 Pipe Laying:

A. All PVC pipe installation shall be installed in accordance with the “Standard Recommended Practice for Underground Installation of Reinforced Concrete Pipe or Flexible Thermoplastic Sewer Pipe,” ASTM D-2321, and the manufacturer’s recommendations.

B. All pipe installation shall be on Class II or Class III Bedding.

C. Each pipe shall be inspected for defects prior to being lowered into the trench. Any pipe showing defects shall be immediately rejected and taken off the site.

D. Pipe shall be cleaned of any dirt or foreign matter.

E. Large rocks or stones shall be removed from the trench to provide a minimum clearance or 6-inches from all sides of the pipe, valve or fittings.

SECTION 02225 - EXCAVATION AND BACKFILL - UTILITIES

F. Pipes shall generally be laid at a depth of 3-feet unless otherwise specified on the Drawings.

3.08 Backfilling:

A. After approval by the Engineer, the newly laid sections of pipe shall be properly backfilled.

B. All backfill material within 2-feet of the pipe, valve, or structure shall be free of cinders, ash, rock, stone, organic, or other unsuitable materials.

C. All trenches shall be backfilled by hand means from the bottom of the trench or bedding material up the sides of the pipe to a level 12-inches over the top of the pipe.

D. Initial backfilling material shall be placed in the trench for its full width on each side of the pipe, fittings, and appurtenances simultaneously in approximately 6-inch layers and each layer thoroughly compacted. Special care shall be exercised in placing and compacting backfill not to damage or mis-align the pipe.

E. From one-foot above the pipe to the finished grade the trench shall be backfilled by hand or approved mechanical means in well compacted one-foot layers in accordance with the following specifications:

1. Pipe trenches within the limits of proposed pavement shall be backfilled in layers not to exceed 12-inches in thickness and each layer shall be compacted and tested for field density. No less than 90% of maximum density per AASHTO T99 Method C shall be acceptable.
2. Compaction test shall be taken on backfills within the limits of proposed pavement at a rate of two test per alternating layer or one test per 100-linear feet per alternating layer, whichever provides the greatest number of tests. Additional testing may be required, as the Engineer deems necessary.
3. Pipe trenches outside the limits of proposed pavement shall be backfilled in layers not to exceed 12-inches in thickness and each layer shall be compacted to a density equal to that of the surrounding area.

(END OF SECTION 02225)

SECTION 02361 - TERMITE CONTROL

1.0 GENERAL

1.01 Related Documents:

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

1.02 Summary:

A. This section includes soil treatment for termite control.

1.03 Definitions:

A. EPA: Environmental Protection Agency.

B. PCO: Pest control operator.

1.03 Submittals:

A. Product Data: Treatments and application instructions, including EPA-Registered Label and Material Safety Data Sheets (MSDS).

B. Product Certificates: Signed by manufacturers of termite control products certifying that treatments furnished comply with EPA regulations for Termiticides.

C. Certificate of Compliance: As detailed in “Quality Assurance” article.

D. Soil Treatment Application Report: After application of Termiticide is completed, submit report for Owner's record information, including the following as applicable:

1. Date and time of application.
2. Moisture content of soil before application.
3. Brand name and manufacturer of Termiticide.
4. Quantity of undiluted Termiticide used.
5. Dilutions, methods, volumes, and rates of application used.
6. Areas of application.
7. Water source for application.

E. Warranties: Special warranties specified in this section.

1.05 Quality Assurance:

A. Applicator Qualifications: A PCO who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment in jurisdiction where project is located and who is experienced and has completed termite control treatment similar to that indicated for this project and whose work has a record of successful in-service performance.

B. Certificate of Compliance: As per the Florida Building Code (8th Edition) Section 1816.1.7: “The rules and laws as established by the Florida Department of Agriculture and Consumer Services shall be deemed as approved with respect to pre-construction soil treatment for protection against subterranean termites. A Certificate of Compliance shall be issued to the building department by the licensed pest control company that contains the following statement:

> ‘The building has received a complete treatment for the prevention of subterranean termites. Treatment is in accordance with rules and laws established by the Florida Department of Agriculture and Consumer Services.’”

C. Regulatory Requirements: Formulate and apply Termiticides, and label with a Federal registration number, to comply with EPA regulations and authorities having jurisdiction.

SECTION 02361 - TERMITE CONTROL

1.06 Project Conditions:

A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with EPA-Registered Label requirements and requirements of authorities having jurisdiction.

1.07 Coordination:

A. Coordinate soil treatment application with excavating, filling, and grading and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs, before construction.

1.08 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.

B. Special Warranty: Written warranty, signed by applicator and Contractor certifying that termite control work, consisting of applied soil Termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation without cost to the Owner up to $50,000 in value.

C. Warranty Period: Five years from date of the Substantial Completion.

2.0 PRODUCTS

2.01 Soil Treatment:

A. Termiticide: Provide an EPA-registered Termiticide complying with requirements of authorities having jurisdiction, in a soluble or emulsible, concentrated formulation that dilutes with water or foaming agent, and formulated to prevent termite infestation. Fuel oil will not be permitted as a dilutant. Use only soil treatment solutions that are not harmful to plants. Provide quantity required for application at the label volume and rate for the maximum Termiticide concentration allowed for each specific use, according to the product's EPA-Registered Label.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AgrEvo Environmental Health, Inc.; a Company of Hoechst and Schering, Berlin.
2. American Cyanamid Co.; Agricultural Products Group; Specialty Products Department.
3. Bayer Corp.; Garden & Professional Care.
4. DowElanco.
5. FMC Corp.; Pest Control Specialties.
6. Zeneca Professional Products.

3.0 EXECUTION

3.01 Examination:

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of the soil, interfaces with earthwork, slab

SECTION 02361 - TERMITE CONTROL

and foundation work, landscaping, and other conditions affecting performance of termite control. Proceed with application only after unsatisfactory conditions have been corrected.

3.02 Preparation:

A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparing substrate. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil and around foundations.

B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended by Termiticide manufacturer.

C. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

3.03 Application, General:

A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.

B. Per the Florida Building Code (8th Edition):

1. Initial chemical soil treatment inside the foundation perimeter shall be done after all excavation, backfilling and compaction is complete.
2. Soil area disturbed after initial chemical soil treatment shall be retreated with a chemical soil treatment, including spaces boxed or formed.
3. Space in concrete floors boxed out or formed for the subsequent installation of plumbing traps, drains or any other purpose shall be created by using plastic or metal permanently placed forms of sufficient depth to eliminate any planned soil disturbance after initial chemical soil treatment.
4. Treated soil shall be protected with a minimum 6-mil vapor retarder to protect against rainfall dilution. If rainfall occurs before vapor retarder placement, retreatment is required. Any work, including placement of reinforcing steel, done after chemical treatment until the concrete floor is poured, shall be done in such manner as to avoid penetrating or disturbing treated soil.
5. Concrete over-pour or mortar accumulated along the exterior foundation perimeter shall be removed prior to exterior chemical soil treatment, to enhance vertical penetration of the chemicals.
6. Chemical soil treatments shall also be applied under all exterior concrete or grade within 1 foot of the primary structure sidewalls. Also, a vertical chemical barrier shall be applied promptly after construction is completed, including initial landscaping and irrigation/sprinkler installation. Any soil disturbed after the chemical vertical barrier is applied shall be promptly retreated.
7. Protective sleeves around metallic piping penetrating concrete slab-on-grade floors shall not be of cellulose-containing materials and shall receive application of a Termiticide in annular space between sleeve and pipe.

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3.04 Applying Soil Treatment:

A. Application: Mix soil treatment Termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of Termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute the treatment evenly.

1. Slabs-on-Grade and Basement Slabs: Underground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
2. Foundations: Adjacent soil including soil along entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers, piers, and chimney bases; and along entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
3. Crawlspaces: Soil under and adjacent to foundations as previously indicated. Treat adjacent areas including around entrance platform, porches, and equipment bases. Apply overall treatment only where attached concrete platform and porches are on fill or ground.
4. Masonry: Treat voids.
5. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.

B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.

C. Post warning signs in areas of application.

D. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

(END OF SECTION 02361)

SECTION 02380 – CONCRETE SIDEWALKS

1.0 DIRECT PURCHASING

This Section is subject to the terms described in Section 01042, Direct Purchasing Procedures, whereby the Owner reserves the right to recover the sales tax on materials by purchasing directly the materials required for this Section. Issuance of Purchase Orders by the Owner shall not relieve the Contractor of any of his responsibilities regarding materials purchases or installation, with the exception of the payments for the materials as purchased.

2.0 GENERAL

2.1 Work Included:

2.1.1 The work required under this section shall include, but not be limited to the following:

a. Concrete sidewalks
b. Concrete equipment pads.
c. Reinforcement for above.
d. Surface finish.
e. Curing and sealing.

2.2 Related Sections:

a. 01010 Summary of Work
b. Refer to Civil Engineering under separate cover.

2.3 References:

ACI 301 - Specifications for Structural Concrete for Buildings.

ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete.

ANSI/ASTM A497 - Welded Deformed Steel Wire Fabric for Concrete Reinforcement.

ANSI/ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.

ANSI/ASTM D1751 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

ASTM A615 - Deformed and Plain Billet Steel for Concrete Reinforcement.

ASTM C33 - Concrete Aggregates.

ASTM C94 - Ready-Mixed Concrete.

ASTM C150 - Portland cement.

ASTM C260 - Air-Entraining Admixtures for Concrete.

ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

ASTM C494 - Chemical Admixtures for Concrete.

SECTION 02380 – CONCRETE SIDEWALKS

2.4 Quality Assurance:
- 2.4.1 Perform work in accordance with ACI 301.
- 2.4.2 Obtain materials from same source throughout.

2.5 Testing:
- 2.5.1 The Contractor shall provide and pay for the services of a qualified, independent testing laboratory, approved by the Owner, to insure that all materials and procedures furnished under this Contract are in compliance with all of the provisions of the Specifications.
- 2.5.2 The Contractor shall be required to cooperate with the representatives of the testing laboratory in every way and at no time prevent or hinder the performance of their work.
- 2.5.3 Three (3) concrete test cylinders will be taken for every 50 or less cubic yards on each class of concrete placed each day.
- 2.5.4 One (1) additional test cylinder will be taken during cold weather and be cured on site under same conditions as concrete it represents.
- 2.5.5 One (1) slump test will be taken for each set of test cylinders taken.

2.6 Submittals:
- 2.6.1 Submit product data.
- 2.6.2 Include data on joint filler, admixtures, and curing compounds.
- 2.6.3 Submit a jointing plan, including location of contraction joints, construction joints, expansion joints, and elevations fifteen days (15) prior to beginning concrete paving.
- 2.6.4 Submit, at least 15 days prior to start of concrete paving, certified laboratory test reports sufficient to verify compliance of proposed mix design (proportions) with the specifications for type and strength of concrete.

3.0 MATERIALS

3.1 Concrete Materials:
- 3.1.1 a. Cement: ASTM C150 type.
  - b. Fine Coarse Aggregates: ASTM X33.
  - c. Water: Clean and not detrimental to concrete.
  - d. Air Entrainment Admixture: Darex.
  - e. Curing and Sealing: Kure-N-Seal 30 as manufactured by Sonneborn Building Products.

3.2 Form Materials:
- 3.2.1 Wood or steel form material, profiled to suit conditions. Joint Filler: ANSI/ASTM D1751.

3.3 Reinforcement:
- 3.3.1 Reinforcing Steel: ASTM A615; 60 ksi yield grade; deformed billed steel bars, uncoated finish.
- 3.3.2 Welded Steel Wire Fabric: Plain type, ANSI/ASTM A185; in flat sheets; coiled rolls; uncoated finish. Fabric size shall be 6 x 6W1.4 unless noted otherwise.
- 3.3.4 Tie Wire: Annealed steel, minimum, 16-gauge size.

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3.3.5 Dowels: ASTM A615; 40 ksi yield grade, plain steel, uncoated finish.

3.4 Accessories:
3.4.1 C171 Sheet materials for curing concrete.

3.5 Admixtures:
3.5.1 Air Entrainment: ASTM C260.

3.6 Concrete Mix:
3.6.1 Mix concrete in accordance with ASTM C94.
3.6.2 Provide concrete with the following characteristics:
a. Compressive strength at 28 days: 3,000 psi, unless as otherwise noted on drawings.
3.6.3 Use accelerating admixtures in cold weather only when approved by Architect/Engineer. Use of admixtures will not relax cold weather placement requirements.
3.6.4 Use set-retarding admixtures during hot weather only when approved by The Architect/Engineer.
3.6.5 Add air entraining agent to concrete mix for concrete work subject to freeze/thaw cycling, and slabs on grade.

4.0 EXECUTION:
4.1 Inspection:
4.1.1 Verify compacted subgrade and base is ready to support paving and imposed loads.
4.1.2 Verify gradients and elevations of base are correct.
4.1.3 Beginning of installation means acceptance of existing conditions.

4.2 Preparation:
4.2.1 Moisten base to minimize absorption of water from fresh concrete.
4.2.2 Notify Architect/Engineer minimum 24 hours prior to commencement of concreting operations.

4.3 Forming:
4.3.1 Place and secure forms to correct location, dimension, and profile.
4.3.2 Assemble formwork to permit easy stripping and dismantling without damaging concrete.
4.3.3 Place joint fillers in vertical position, in straight lines. Secure to formwork during concrete placement.

4.4 Reinforcement Installation:
4.4.1 Place reinforcement as shown on drawings for slabs-on-grade.
4.4.2 Interrupt reinforcement as control, contraction, or expansion joints, as shown.
4.4.3 Place reinforcement to achieve slab and curb alignment, as detailed.
4.4.4 Provide dowelled joints at interruptions of concrete with one end of dowel set in capped sleeve to allow longitudinal movement, if and as shown.
4.4.5 Horizontal reinforcing bars shall be supported over earth or forms on protected metal (galvanized, plastic, stainless steel) spacers, chairs, bolsters, and ties, in accordance with CRSI "Manual of Standard Practice

SECTION 02380 – CONCRETE SIDEWALKS

for Detailing Reinforced Concrete Structures."

4.4.6 The minimum concrete cover, unless noted otherwise on the drawings, shall be as follows:
- a. Three inches (3") when concrete is placed directly against earth.
- b. Two inches (2") when concrete is exposed to weather or earth.
- c. Three quarter inch (3/4") for general construction.

4.4.7 Field lapped splices shall conform to Class "C" splices, as defined in ACI 318-83 unless noted otherwise on the drawings.

4.4.8 Lap bars shall be provided at corners and abrupt changes in directions of walls and footings.

4.4.9 Reinforcing in strip footings shall be continuous through all column footings (or splices to column footing reinforcing) and around all corners, intersections and steps.

4.4.10 Welded wire fabric field splices shall be not less than two spacing's (2) of cross wires or six inches (6"), whichever is greater.

4.4.11 Placement of reinforcing steel shall be approved by the Engineer prior to placement of concrete.

4.5 Formed Joints:

4.5.1 Place expansion control contraction joints at intervals, to correct elevation and profile, as shown. Align curb, gutter, and sidewalk joints.

4.5.2 Place joint filler between paving components and building or other appurtenances. Recess top of filler one half inch (1/2").

4.5.3 Maintain optimum moisture content for compacting base material during placement operations.

4.5.4 Compact layers of base course material to not less than ninety-eight percent (98%) of maximum dry density, modified proctor, ASTM D2049.

4.6 Placement of Base Course:

4.6.1 Place base course on prepared sub-grade in compacted layers to establish required thickness and elevations.

4.6.2 Maintain optimum moisture content for compacting base material during placement operations.

4.7 Placing Concrete:

4.7.1 Place concrete in accordance with ACI 301.
- a. Hot Weather Placement: ACI 301.
- b. Cold Weather Placement: ACI 301.

4.7.2 Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.

4.7.3 Place concrete to thickness indicated on the drawings. Concrete thickness shall be six inches (6"), unless noted otherwise, and is to be placed over 6 mil vapor barrier.

4.7.4 Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur. Install all concrete on 6 mil vapor barrier.

4.7.5 Slabs to receive welded wire fabric shall have two thirds (2/3) their total concrete depth placed, the fabric positioned properly, and then the final one third (1/3) of the concrete depth placed.

4.7.6 Use mechanical vibrators for placement of all concrete; provide a standby

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vibrator on the job while placing.

4.7.7 Place concrete to pattern indicated. Saw cut contraction joints three-sixteenth inch (3/16") wide at an optimum time after finishing. Cut one-third into depth of slab.

4.8 Finishing:

4.8.1 Area Paving: Heavy broom finish parallel to line of traffic, Wood float, or as shown.

4.8.2 Sidewalk Paving: Light broom finish perpendicular to traffic, radius and trowel joint edges.

4.8.3 Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

4.9 Placing Joints:

4.9.1 Place joints straight and vertical.

4.9.2 Longitudinal and transverse joint spacing shall be at regular intervals. Individual spacing's may vary slightly to next catch basin and manhole castings.

4.9.3 The maximum allowable joint spacing's are:

a. Twelve foot (12') for slabs six inches (6") and less in thickness.

b. Fifteen foot (15') for slabs over six inches (6") in thickness.

c. Length/width ratio of slabs shall not exceed 1:3.

4.9.4 Joints shall be continuous across the slab and must extend completely through integral curbs.

4.9.5 Full depth expansion joints one-half inch (1/2") wide shall be installed to isolate all fixed objects (manholes, casting, existing paving, etc.).

4.9.6 Isolate from adjacent pavement all manhole covers and catch basin rims with a concrete collar and an expansion joint.

4.9.7 Jointing shall be in accordance with jointing plan approved by the Architect.

4.9.8 Constructing Urethane Expansion Joints:

a. Concrete shall be placed with the premolded joint filler in place, and with a closed cell backer rod to allow for the proper sealant depth.

b. After the concrete has set, the joints shall be thoroughly cleaned and wire brushed to remove debris and/or curing compound, and primer shall be applied to surfaces which will receive sealant. Sealant shall be applied to clean, dry surfaces. Adjacent surfaces shall be protected with non-staining masking tape. The work shall be performed by a qualified professional caulker.

c. Primer and sealant shall be applied in accordance with the manufacturer's written recommendations, using hand guns or pressure equipment on properly prepared surfaces. Temperature of sealant and concrete shall be as recommended by the sealant manufacturer. Sealant shall be forced into the joint in front of the tip of the caulking gun, not pulled after it, and shall be forced against the sides to prevent entrapped air or pulling of sealant off the sides.

d. Sealant shall be finished slightly recessed from the adjacent surface, adjusted in accordance with the outside air temperature. The colder the day, the greater the recess needed. Masking tape shall be removed immediately after tooling of the sealant and before the sealant face starts to skin over. Excess sealant shall be

SECTION 02380 – CONCRETE SIDEWALKS

removed from adjacent surfaces.

e. Sealant shall be protected from pedestrian and vehicular traffic by barricades or flagging until traffic will not track it.

4.10 Field Quality Control:

4.10.1 Field inspection and testing shall be performed by testing laboratory engaged by the Owner.

4.10.2 Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

4.11 Protection:

4.11.1 Immediately after placement, protect concrete from premature drying, excessive hot or cold temperatures, and mechanical injury.

(END OF SECTION 02380)

SECTION 02940 - LAWN SEEDING

1.0 GENERAL

1.01 Summary: Includes but not limited to furnishing and installing lawn as described in Contract Documents. Refer to Site Civil Engineering documents under separate cover when in conflict. Civil Engineering documents supersede Architectural with respect to area of construction outside the footprint of building.

2.0 PRODUCTS

2.01 Materials:

A. Seed:

1. If seeding occurs between March and September:
   a. Argentine Bahia - Paspalpom notatum at 250 pounds/acre.
   b. Brown Top Millet - Panicom species at 85 pounds/acre.
2. If seeding occurs between September and March:
   a. Argentina Bahia - Paspalpom notatum at 250 pounds/acre.
   b. Annual Rye Grass - Lolium Multiflorum at 450 pounds/acre.
3. Purchase seeds which bear this season's certification of weight, purity and germination from a reputable seed company.

2.02 Fertilizer: Commercial 16-16-8 unless indicated differently.

3.0 EXECUTION

3.01 Preparation:

A. Protection:

1. Take care and preparation in work to avoid conditions which will create hazards. Post signs or barriers as required.
2. Provide adequate means for protection from damage through excessive erosion, flooding, heavy rains, etc. Repair or replace damaged areas.

B. Site Preparation:

1. Loosen area four (4) inches deep, dampen thoroughly, and cultivate to properly break up clods and lumps.
2. After cultivation, rake area to remove clods, rocks, weeds, roots, and debris. Perform grading and shaping refinements to bring surface to true uniform planes free from irregularities and to provide drainage and proper slope to catch basins.
3. Just prior to seeding, fertilize lawn areas with specified material at fifteen (15) pounds per 1,000 square feet.
4. After lawn areas have been fertilized, take no heavy objects over them except lawn rollers.
5. After preparation of lawn areas, roll lawn-planting areas in two directions at approximately right angles with water ballast roller weighing 100 to 300 pounds according to soil type.
6. Rake or scarify and cut or fill irregularities that develop as required and again roll until area is true and uniform, free from lumps, depressions, and irregularities.

SECTION 02940 - LAWN SEEDING

3.02 Installation:

A. Seeding: After lawn areas are graded, experienced men shall sow seed with adequate equipment at a time when little or no wind is blowing.

B. Top Dressing: After sowing, rake, broom or disk seed in gently and roll area to firm in seed. After rolling, cover area evenly with top dressing of existing soil.

C. After Top Dressing: Thoroughly water seeded areas. Reseed areas that do not show prompt germination at fifteen (15) day intervals until an acceptable strand of grass is assured.

3.03 Cleaning: Upon completion of planting operation, clear site of debris, superfluous materials and equipment, all of which shall be entirely removed from premises.

3.04 Protection: Protect seeded areas against traffic or other use immediately after seeding is completed by placing adequate warning signs and barricades.

(END OF SECTION OF 02940)

SECTION 03010 - CAST-IN-PLACE CONCRETE

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 Description of Work: Forming, shoring, bracing and anchorage concrete reinforcement and accessories, cast-in-place concrete.

1.03 Work Installed, but Furnished Under Other Sections:
- A. Masonry accessories attached to formwork.
- B. Metal fabrications attached to formwork.
- C. Flashing rights attached to form work.

1.04 Related Work: Walks, and curbs, precast concrete.

1.05 Standards and Codes:
- A. ACI 301 Specification of Structural Concrete for Buildings.
- B. ANSI/ASTM A-185 - Welded Steel Wire Fabric for Concrete Reinforcement.
- C. ASTM A-615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.
- D. ASTM C-33 - Concrete Aggregates.
- E. ASTM C-94 - Ready-Mixed Concrete.
- F. ASTM C-150 - Portland cement
- G. ASTM C-260 - Air Entraining Admixtures for Concrete.
- H. ASTM C-309 - Liquid Membrane-Forming Compounds for Curing Concrete.
- I. ASTM D-2103 - Polyethylene Film and Sheeting.
- J. FS TT-C-800 - Curing Compound, Concrete, for New Surfaces.
- K. ACI 318 “Building Code Requirements for Reinforced Concrete”
- L. ACI 304 “Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete”
- M. ACI 311 “Recommended Practice for Concrete Inspection”
- N. ACI 347 “Recommended Practice for Concrete Formwork”
- O. AWS D1.4 “Structural Welding Code - Reinforcing Steel”
- P. CRSI “Manual of Standard Practice”
- Q. American Society for Testing Materials (ASTM): All ASTM standards shall apply where appropriate.
- R. ASTM C494 – Water Reducing Admixtures.
- S. American Concrete Institute (ACI) - All ACI standards and specifications shall apply where appropriate.

1.06 Tests:
- A. A recognized testing laboratory approved by the Architect shall design the mixes of concrete to be used and to test the compression specimens made during the placing of the concrete. No concreting shall start until the Contractor has received written notice from the laboratory that all designs required have been received and approved by the Architect.
- B. Test specimens to determine compressive strength shall be taken by the Contractor and delivered to the testing laboratory by the Contractor, at his expense, and in accordance with procedures set forth in ASTM Standards C-31 and C-39. Cost of testing shall be at the expense of the Contractor.

SECTION 03010 - CAST-IN-PLACE CONCRETE

C. There shall be four compression specimens made for each strength of concrete placed on any one day, and for each fifty yards of concrete, also at such other times as may be deemed necessary for the Architect. One cylinder shall be broken at seven days and two cylinders broken at twenty-eight days. The average of the two twenty-eight day "breaks" shall be used as the test result. One cylinder shall be retained by test laboratory and broken only when and if instructed by the Architect.

D. Concrete not meeting the strength requirements set forth herein shall be removed and replaced without additional cost to the Owner at the discretion of the Architect. Should strength results of any cylinder indicate that the concrete has not obtained specified strength, the spare cylinder shall also be tested to see if it passes the strength requirements. Should the spare cylinder fail to meet the strength requirements of the specifications, core-boring tests conforming to ASTM Standard C-42 shall be made. Should the core boring tests indicate the strength requirements of the concrete below that specified, load tests conforming to ACI Standard 318 shall be made. The Contractor shall pay any ASTM C-42 tests or load tests required by cylinder tests not reaching specified strength.

E. Laboratory test results shall be sent to the Architect, the Owner, and the Contractor.

1.07 All cast-in-place concrete work shown is governed by this Section. Concrete strength not otherwise designated shall be 3,000 psi, as determined by the use of ASTM C-31 and C-39. All precast concrete shall be 4,000 psi.

1.08 Quality Assurance:

A. Workmanship - The Contractor is responsible for the correction of concrete work that does not conform to the specific requirements, including strength, tolerances, and finishes. Correct deficient concrete as directed by the Architect/Engineer. Should cylinders and cores indicate unacceptable concrete, load testing or removal and replacement of the concrete may be required at no cost to the Owner.

B. Concrete Testing Service - The Contractor shall employ, at his employ, at his/her own expense, a testing laboratory experienced in design and testing of concrete materials and mixes to perform material evaluation tests, to design concrete mixes, and to perform strength tests associated with form removal. Testing agency shall meet the requirements of ASTM E-329.

C. The Contractor shall employ and pay an independent testing laboratory to perform the testing of the concrete during the process of the work. Allow free access to material stockpiles and facilities at all times. Tests, not specifically indicated to be done at the Owner’s expense, including the retesting or rejected materials and installed work, shall be done at the Contractor’s expense.

D. Welding of reinforcing steel shall be limited to welders whose competency has been treated according to standards of Structural Welding Code of American Welding Society.

1.09 Submittals:

A. Shop Drawings - Concrete Reinforcement: Submit shop drawings and fabrication, bending and replacement of concrete reinforcement. Comply with ACI Manual 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of reinforcement. Show location of construction joints planned.

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B. Manufacturer's Data; Concrete, General: Submit manufacturer's product data, specifications with application and installation instructions for proprietary materials and items, including admixtures, bonding agents, waterstops, joint systems, chemical floor hardeners, and dry shake finish materials.

C. Test reports specified in Paragraphs PROPORTIONING AND DESIGN OF MIXES, QUALITY CONTROL TESTING DURING CONSTRUCTION.

2.0 PRODUCTS

2.01 Form Materials:

A. Forms for Exposed Finish Concrete:

1. Unless otherwise shown or specified, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.
2. Use plywood complying with US Product Standard PS-I "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill oiled, and edge sealed, with each piece bearing legible trademark of an approved inspection agency.

B. Forms for Unexposed Finish Concrete - Form concrete surfaces which will be unexposed in finished structure with plywood, lumber metal or other acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Form Coatings - Provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces to be cured with water or curing compound.

2.02 Reinforcing Materials:

A. Reinforcing Bar - ASTM A-615, Grade 60. TSQP-S-632, Type 11, DET ASTM A3 All reinforcement bars, except #2, shall be deformed bars in conformance with ASTM A-305 latest edition. Bar sized #3 through #11 shall meet the requirements for ASTM A-615 latest edition with minimum yield point strength of 60,000 psi. Provide Shop Drawings.

B. Galvanized Reinforcing Bar - ASTM A-53, hot-dip galvanized after fabrication and bending.

C. Welded Wire Fabric -ASTM A-185, welded steel wire fabric. Slab reinforcement mesh shall be cold drawn wire made especially for concrete work. Mesh shall be 6 x 6 WI.4 x WI.4 for 4" slabs on grade and 6 x 6, W2.9 x W2.9 mesh at 6" slabs on grade. Welded wire fabric shall be in conformance with ASTM A-185 latest edition.

D. Supports for Reinforcement -Provide supports for reinforcement including, bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI recommendations, unless otherwise indicated. Wood, brick and other devices will not be acceptable.

E. Slabs-on grade -Use supports or horizontal runners where wetted base material will not support chair legs.

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F. Exposed-to-view concrete surfaces - Where legs of support are in contact with forms, provide supports with legs which are hot-dip galvanized or plastic protected or stainless steel protected.

2.03 Concrete Materials:

A. Portland Cement - ASTM C-150, as follows:
1. Provide Type I cement, except as otherwise indicated.
2. Provide Type III cement for High-Early Strength concrete where shown or scheduled.
3. Use only one brand of cement for each required type through-out the project, unless otherwise accepted by the Architect/ Engineer.

B. Aggregates:
1. Maximum aggregate size shall not be larger than one-fifth of the narrowest dimension between sides of forms, one third of the depth of slabs, nor three-fourths of the minimum clear spacing between individual reinforcing bars or bundles of bars. Provide aggregates from one source of supply to ensure uniformity in color, size, and shape.
2. Normal Weight Aggregates - ASTM C-33, and as herein specified. Local aggregates not complying with ASTM C-33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to the Architect/Engineer.
a) Fine Aggregate - Clean, sharp, natural sand free from loam, clay, lumps or other deleterious substances.
b) Coarse Aggregate - Clean, uncoated, processed aggregate containing no clay, mud, loam, or foreign matter, as follows:
1) Crushed stone, processed from natural rock or stone.
2) Washed gravel, either natural or crushed. Use of pit or bank run gravel is not permitted.
c) Pea Gravel Aggregate- Conform to ASTM C-404, Size No. 8. C. Water: Clean, fresh, drinkable.

C. Admixtures - Provide admixtures produced by established reputable manufacturers and use in compliance with the manufacturer's printed directions. Do not use admixtures which have not been incorporated and tested in accepted mixes, unless otherwise authorized in writing by the Architect/Engineer.
1. Air-Entraining Admixture - ASTM C-260.
2. Water-Reducing Admixtures - ASTM C-494, Type A.
3. Set-Control Admixture - ASTM C-494, as follows:
a) Type D, Water-reducing and Retarding.
b) Type E, Water-Reducing and Accelerating.
4. Fly Ash - ASTM C-618, Class F.
5. Calcium Chloride - Do not use calcium chloride in concrete.

2.04 Related Materials:

A. Waterstops - Provide flat, dumbbell type or centerbulb type waterstops at construction joints and other joints as shown. Size to suit joints. Rubber or PVC waterstops, at Contractor's option, with rubber units complying with Corps of Engineers CRD-C513 and PVC units complying with CRD-C572.

B. Preformed Expansion Joint Fillers - Fiber type conforming to ASTM D 1751 or Cork, ASTM D 1752, Type II.

C. Joint Sealing Compound - See Division 7.

D. Moisture Barrier - 10 mil. Visqueen vapor barrier or approved equal.

E. Chemical Hardener - Colorless aqueous solution containing a blend of magnesium fluosilicate and zinc fluosilicate combines with a wetting agent, containing not less than 2 lbs. of fluosilicate per gal.

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F. Curing Materials:
1. Absorptive Cover - Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 3.
2. Moisture-Retaining Cover - One of the following, complying with ASTM C-171.
a) Waterproof paper.
b) Polyethylene film
c) Polyethylene-coated burlap.
3. Membrane-Forming Curing Compound - ASTM C-309, Type 1.

2.05 Proportioning and Design of Mixes:
A. General:
1. All concrete shall contain a minimum of 5-1/2 sacks of cement per cubic yard. Tremie concrete, where required; use minimum of 7 sacks of cement per cubic yard. Maximum water to cement ratio (w/c) shall be 0.55 regardless of compressive strength.
2. All concrete not specifically designated shall be proportioned for a strength of 3,000 lbs., per sq. in. at 28 days of age.

B. Slump Limits:

	Slump in Inches	
Type of Construction	Maximum	Minimum
Reinforced foundation walls and footings	5	3
Slabs and beams	5	3
Reinforced columns	6	3
Masonry Grout	11	8

C. Proportion mixes by either laboratory trial batch or field experience methods, using materials to be employed on the project for each class of concrete required, complying with ACI 211.1 for normal weight concrete and ACI 211.2 for structural light- weight concrete.
1. Field Experience Method - When field experience method is used to select concrete proportions, establish procedures as specified in ACI 301 and ACI 318. When proportioning by field experience method, furnish mix design and independent testing facility proof of standard deviation using materials, mix and products facility proposed.
2. Laboratory Trial Method - When laboratory trial batches are used to select concrete proportions, prepare test specimens in accordance with ASTM C-39, as specified in ACI 301.
a) When proportioning by the trial batch method, furnish compressive strength developed at 7 days and 28 days, from not less than 2 test cylinders cast for each 7 and 28 day test, and for each design mix.
b) Establish a curve showing relationship between water cement ratio (or cement content) and compressive strength, with at least 3 points representing batches which produce strengths above and below that required. Use not less than 2 specimens tested at 28 days, or an earlier age when acceptable to the Architect/Engineer, to establish each point on the curve.

D. Submit Testing Service reports to the Architect-Engineer of each proposed mix for each type of concrete at least 15 days prior to start of work. Do not begin concrete production until mix data have been reviewed by the Architect/Engineer.

E. Admixtures:
1. Use air-entraining admixture in all concrete, unless other-wise indicated. Add air-entraining admixture at the manufacturer's prescribed rate to result

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in concrete at the point of placement having 4-1/2 percent entrained air with tolerance in either direction from this optimum of 1-1/2 percent.

2. Use amounts of admixtures as recommended by the manufacturer for climatic conditions prevailing at the time of placing. Adjust quantities and types of admixtures as required to maintain quality control.

F. Adjustment to Concrete Mixes: Mix design adjustment may be requested by the Contractor when characteristics of material, job conditions, weather, test results, or other circumstances warrant; at no additional cost to the Owner and as accepted by the Architect/Engineer before using in the work.

G. Bending Bars - Standard bends for bars shall be of diameters and lengths specified in “Manual of Standard Practice for Detailing Reinforced Concrete Structures” ACI-315.

H. Tie Wire - All reinforcing steel shall be firmly tied in place with not less than No. 18 Gauge wire.

3.0 EXECUTION

3.01 Forms:

A. Design of formwork for structural stability and sufficiency is the Contractor's responsibility.

B. Design, erect, support, brace, and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by the concrete structure. Construct the form work so concrete members and structures are of correct size, shape, alignment, elevation, and position.

C. Construct forms complying with ACI 347, to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up joints to prevent leakage of cement paste.

D. Fabricate forms for easy removal without hammering or prying against the concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, and recesses to prevent swelling and for easy removal.

E. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

F. Chamfer exposed corners and edges 3/4 inches, unless other wise noted, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

G. Form Ties - Factory-fabricated, adjustable-length, removable, or snap-off metal form ties, designed to prevent for deflection, and to prevent Spalding concrete surfaces upon removal.

1. Unless otherwise shown, provide ties so portion remaining within concrete after removal is at least 1-1/2" inside concrete.

2. Unless otherwise shown, provide form ties which will not leave holes larger than 1" diameter in concrete surface.

H. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings,

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recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

I. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Re- tighten forms after concrete placement if required to eliminate mortar leaks.

3.02 Placing Reinforcement:

A. Comply with the specified codes and standards, and Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.

C. Accurately position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.

D. Place reinforcement to obtain at least the minimum coverage for concrete protection. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces. Do not place reinforcing bars more than 2" beyond the last leg of continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.

E. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

F. Splice:

1. Provide standard reinforcement splices by lapping ends, placing bars in contact, and tightly wire tying. Comply with requirements of ACI 318 for minimum lap of spliced bars. Comply with the requirements of AWS D1.4 for field welding. Prior to field welding, determine the weldability of reinforcing bars by a laboratory chemical analysis of steel. Only steel conforming to the chemical requirements specified in AWS D1.4 may be welded.
2. Mechanical butt splicing using exothermic welding processes and high-strength steel sleeves which develop the same values of strength shall be used for size no. 11 bars in columns. Comply with manufacturer's directions of preparation of bars and installation procedures. All other size column bars may be lap sliced.

3.03 Joints:

A. Construction Joints - Locate and install construction joints, which are not shown on the drawings, so as not to impair the strength and appearance of the structure, as acceptable to the Architect/Engineer.

B. Provide keyways at least 1-1/2" deep in all construction joints in walls, slabs and between walls and footings; accepted bulk heads designed for this purpose may be used for slabs.

C. Place construction joints perpendicular to the main reinforcement. Continue all reinforcement across construction joints unless shown or noted otherwise.

D. Waterstops - Provide waterstops in construction joints as shown on the drawings. Install waterstops to form a continuous diaphragm in each joint. Make provisions to support and protect waterstops during the progress of the work. Fabricate field

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joints in waterstops in accordance with manufacturer's printed instructions. Protect waterstop material from damage where it protrudes from any point.

E. Isolation Joints in Slabs-on-Ground - Construct isolation joints in slabs on ground at all points of contact between slabs on ground and vertical surfaces, such as column pedestals, foundation walls, grade beams and elsewhere as indicated.

F. Control Joints in Slabs-on-Ground: Construct control joints in slabs-on-ground to form panels of patterns as shown. Use inserts 1/4" wide x 1/5 to 1/4 of the slab depth, unless otherwise shown. Form control joints by inserting a pre-molded hardboard or fiber board strip into the fresh concrete until the top surface of the strip is flush with the slab surface. After the concrete has cured, remove inserts and clean groove of loose debris. Joint sealant material is specified in Division 7. Sawn joints are permitted.

3.04 Installation of Embedded Items:

A. Set and build into the work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instruction, and directions provided by suppliers of the items to be attached.

B. Edge Forms and Screed Strips for Slabs - Set edge forms or bulk heads and intermediate screed strips for slabs to obtain the required elevations and contours in the finished slab surface. Provide and secure units sufficiently strong to support the types of screed strips by the use of strike-off templates or accepted compacting type screeds.

3.05 Preparation of Form Surfaces:

A. Coat the contact surfaces of forms with a form-coating compound before reinforcement is placed.

B. Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of the form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in the forms or to come into contact with concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

C. Coat steel forms with a non-staining, rust-preventative form oil or otherwise protect against rusting. Rust stained steel form work is not acceptable.

3.06 Concrete Mixing:

A. General: Mix materials in an acceptable drum type batch machine mixer. For mixers of one cu. yd., or smaller capacity, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after all ingredients are in the mixer, before any part of the batch is released. For mixers of capacity larger than one cu. yd., increase the min. 1-1/2 minutes of mixing time by 15 seconds for each additional cu. yd., or fraction thereof. Provide a batch ticket for each batch discharged and used in the work, indicating the project identification name and number, date, mix type, mix time, quantity, and amount of water introduced.

B. Ready-Mix Concrete: Comply with the requirements of ASTM C 94, and as herein specified.

1. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required. When the air temperature is between 85 degrees Fahrenheit and 90 degrees Fahrenheit, reduce the mixing and delivery time from 1-1/2 hours

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to 75 minutes. When the air temperature is above 90 degrees Fahrenheit, reduce the mixing and delivery time to 60 minutes.

2. No additional water shall be added to concrete without the approval of the Architect/Engineer. Should additional water be required to obtain a slump as specified in this section for the type of concrete, the Contractor shall perform slump tests in accordance with ASTM C 143 to determine the actual slump of the concrete in the mixer. The Contractor may then add water, but in no case shall the additional water exceed 3 percent of the mix-design water content, nor shall the slump of the mix exceed the maximum slump specified for the type concrete. Slump tests and the addition of water to the mixer shall be completed within 15 minutes of the arrival of the mixer at the site. Additional water shall not be added to the mix after the mixer has been on the site longer than 15 minutes.
3. A delivery ticket showing truck number, date, and time that mixing was started shall be given to the Contractor's superintendent at the job site before placing the concrete from the truck mixer. At the job site the Contractor's Superintendent shall note on the delivery ticket the time of completion of the concrete placement from the truck and the general area of the structure in which the concrete was placed. A complete file of all delivery tickets shall be maintained and kept available at the job site until completion of the project.

3.07 Concrete Placement:

A. Comply with ACI 304, and as herein specified.

B. Pre-placement Inspection - Before placing concrete, inspect and complete the formwork installation, reinforcing steel, and items to be embedded or cast-in. Thoroughly wet wood forms immediately before placing concrete where form coatings are not used. Coordinate the installation of joint materials and moisture barriers with placement of forms and reinforcing steel.

C. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weak ness within the section. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation due to re-handling or flowing. Maintain reinforcing in the proper position during concrete placement operations. Concreting shall be carried on at such a rate that the concrete is at all times plastic and flow steadily into spaces between reinforcing.

D. Placing Concrete in Forms - Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where replacement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with the recommended practices of ACI 309, to suite the type of concrete and project conditions.
2. Do not use vibrators to transport concrete inside of forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than the visible effectiveness of the machine. Place vibrators to rapidly penetrate the placed layer of concrete and at least 6" into the preceding layer. At each

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insertion limit the duration of vibration to the time necessary to consolidate the concrete and complete embedment of reinforcement and other embedded items without causing segregation of the mix.

3. All concrete shall be thoroughly consolidated by suitable means during placement and shall be worked around reinforcement and embedded fixtures and into corners of forms. Minimum concrete wet cure time to be seven (7) days at 50 degrees minimum temperature. ACI 318-95 Section 5.11.1 / SBC Section 1906.5.1.

E. Placing Concrete Slabs - Deposit and consolidate concrete slabs in a continuous operation, within the limits of construction joints, until the placing of a panel or section is completed.

F. Bring slab surfaces to the correct level with a straightedge and strikeoff. Use bull floats or darbies to smooth the surface, leaving it free of humps or hollows. Do not sprinkle water on the plastic surface. Do no disturb the slab surfaces prior to beginning finishing operations.

G. Do not place concrete in an inundated excavation.

H. Cold Weather Placing - Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as here in specified. When air temperature has fallen to or is expected to fall below 40° F, uniformly heat all water and aggregates before mixing as required to obtain a concrete mixture temperature of 50° F at point of placement.

I. Hot Weather Placing:

1. When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.
2. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90° F (32°C). Mixing water may be chilled, or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing.
3. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
4. Wet forms thoroughly before placing concrete.
5. Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

J. The following concrete is prohibited:

1. Partially hardened concrete.
2. Contaminated concrete.
3. Re-tempered concrete.
4. Concrete that has been re-mixed after it has taken its initial set.

3.08 Finish of Formed Surfaces:

A. Rough Form Finish - For formed concrete surfaces not exposed to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes, and defective areas repaired and patched, and fins and other projections exceeding 1/4" in height rubbed down or chipped off.

B. Smooth Form Finish - For formed concrete surfaces exposed to view, or to be covered with a coating material applied directly to concrete, or a covering material

applied directly to concrete, such as waterproofing, damp proofing, painting or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.

C. Smooth Rubbed Finish:
   1. Provide smooth rubbed finish to scheduled concrete surfaces, which have received smooth form finish treatment, not later than one day after form removal.
   2. Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.

D. Related Uniformed Surfaces: At tops of walls, horizontal off sets surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.09 Monolithic Slab Finishes:

A. Scratch Finish:
   1. Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, Portland cement terrazzo, and other bonded applied cementitious finish flooring material, and as otherwise indicated.
   2. After placing slabs, plane surface to a tolerance not exceeding 1/2" in 10' when tested with a 10' straightedge. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set, with stiff brushes, brooms, or rakes.

B. Float Finish:
   1. Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified.
   2. After screening, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats or by handfloating if area is small or inaccessible to power units. Check and level surface plane to a tolerance not exceeding 1/4" in 10' when tested with a 10' straightedge. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

C. Trowel Finish:
   1. Apply trowel finish to monolithic slab surfaces to be covered with resilient flooring, paint or other thin film finish coating system.
   2. After floating begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with a surface plane tolerance not exceeding 1/8" in 10' when tested with a 10' straightedge. Grind smooth surface defects which would telegraph through applied floor covering system.

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D. Non-Slip Broom Finish:
   1. Apply non-slip broom finish to exterior concrete platforms, steps and ramps, and elsewhere as indicated.
   2. Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

E. Non-Slip Aggregate Finish: Apply non-slip aggregate finish where indicated.
   1. After completion of float finishing, and before starting trowel finish, uniformly spread 25 lbs. of dampened non-slip aggregate per 100 sq. ft. of surface. Tamp aggregate flush with surface using a steel trowel, but do not force below surface. After broadcasting and tamping, apply trowel finishing as herein specified.
   2. After curing, lightly work surface with a steel wire brush, or an abrasive stone, and water to expose non-slip aggregate.

3.10 Concrete Curing and Protection:

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
   1. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting; keep continuously moist for not less than 7 days.
   2. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

B. Curing Methods: Perform curing of concrete by moist curing, by moisture-retaining cover curing, by curing compound, and by combination thereof, as herein specified.
   1. Provide moisture curing by following methods.
      a) Keep concrete surface continuously wet by covering with water.
      b) Continuous water-fog spray.
      c) Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping
   2. Provide moisture-cover curing as follows: Cover concrete surfaces with moisture- retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
   3. Provide curing compound to slabs as follows:
      a) Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
      b) Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, damp- proofing, membrane roofing, flooring, painting, and other coatings and finish materials, unless otherwise acceptable to Architect.

C. Curing Formed Surfaces - Cure formed concrete surfaces, including undersides of beams, supported slabs and other similar surfaces by moist curing with forms in

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place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

D. Curing Unformed Surfaces:
   1. Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing compound.
   2. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.

3.11 Removal of Forms:

A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50° F. (10° C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

B. Formwork supporting weight of concrete, such as beam soffits, joints, slabs and other structural elements, may not be removed in less than 14 days and until concrete has attained design minimum compressive strength at 28 days. Determine potential compressive strength of in place concrete by testing field-cured specimens representative of concrete location or members.

C. Form facing material may be removed 4 days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

3.12 Re-Use of Forms:

A. Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated, or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new form work.

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Architect.

3.13 Miscellaneous Concrete Items:

A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

B. Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.

3.14 Concrete Surface Repairs:

A. Patching Defective Areas:
   1. Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect.

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2. Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

B. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at in- conspicuous location to verify mixture and color match be- fore proceeding with patching. Compact mortar in place, and strike-off slightly higher than the surrounding surface.

C. Repair of Formed Surfaces - Remove and replace concrete having defective surfaces if defects cannot be repaired to satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections that cannot be re- moved by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.

D. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

E. Repair of Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope.

F. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects, as such, include crazing, cracks in excess of 0.01" wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets, and other objectionable conditions.

G. Correct high areas in unformed surfaces by grinding, after concrete has cured at least 14 days.

H. Correct low areas in unformed surfaces during, or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish re paired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect. Repair defective areas, except random cracks and single holes not exceeding in diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as ori9inal concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

I. Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of duct, dirt and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part Portland cement to 2-1/2 parts fine aggregate passing a no. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has

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dried. Compact dry-pack mixture in place, and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

J. Use epoxy-based mortar for structural repairs, where directed by Architect.

K. Repair methods not specified above may be used, subject to acceptance of Architect.

3.15 Quality Control Testing During Construction:

A. The Contractor shall employ a testing laboratory approved by Architect/Engineer to perform other tests and to submit test reports. Sampling and testing for quality control during placement of concrete shall include the following, as directed by Architect.

Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.

1. Slump - ASTM C 143; one test for each concrete load at point of discharge; and one test for each set of compressive strength test specimens.
2. Concrete Temperature - Test hourly when air temperature is 40°F (4°C) and below, and when 80°F (27°C) and above; and each time a set of compression test specimens made.
3. Compression Test Specimen: ASTM C-31; one set of 4 standard cylinders for each compressive strength test, unless other wise directed. Mold and store cylinders for laboratory cured test specimens except when field cure test specimens are required.
4. Compressive Strength Tests: ASTM C-39; one set for each 50 cu. yds. or fraction thereof, of each concrete class placed in any one day or for each 5,000 sq. ft. of surface area placed; 1 specimen tested at 7 days, 2 specimens tested at 28 days, and 1 specimen retained in reserve for later testing if required.
    a) When strength of field-cured cylinders is less than 85% of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
    b) Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength, and no individual strength test result falls below specified compressive by more than 500 psi.

B. Test results will be reported in writing to Architect and Contractor on same day that tests are made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials compressive breaking strength and type of break for both 7 day tests and 28 day tests.

C. Additional Tests - The testing service will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed. Contractor shall pay for such tests conducted, and any other additional testing as may be required, when unacceptable concrete is verified.

(END OF SECTION 03010)

SECTION 04100 - MASONRY, MORTAR AND ACCESSORIES

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including General Supplementary Conditions and General Requirements, apply to the work specified in this Section.

1.02 Description of Work: Provide all labor, material, and equipment necessary for the complete masonry work as shown on the Drawings and herein specified.

1.03 Standards:

A.	ASTM -	American Society for Testing Materials
B.	SCPI -	Structural Clay Products Institute
C.	FCPA -	Florida Concrete and Products Association
D.	ACI 530 -	American Concrete Institute

1.04 Codes:

A.	MASONRY CEMENT	ASTM C-91-88
B.	PORTLAND CEMENT	ASTM C-150-68
C.	SAND	ASTM C-144 Use clean, sharp white mortar sand.
D.	BLOCK, REGULAR WT.	ASTM C-129 with Aggregate ASTM C-33
E.	BLOCK, LIGHT WT	ASTM C-90 with 100% ASTM C-331 Aggregate

2.0 MATERIALS

2.01 Mortar Material: Deliver masonry cement and Portland cement in unopened packages, identified by Manufacturer's names. Store and protect materials from moisture and contamination. Open only those packages necessary for the immediate scheduled unit of work.

2.02 Accessories: Deliver accessories packaged or bundled and identified by Manufacturer's numbers and names. Store off of the ground. Protect from damage.

2.03 Concrete Block: Deliver concrete block on pallets. Unload on pallets by mechanical means. Store above ground. Protect against wetting. Handle and transport to the work in a manner to minimize chipping and spilling. Compression strength of 1900 psi.

2.04 Masonry Cement: Masonry Cement shall conform to Specifications for Masonry Cement, ASTM C-91-68. Color to match existing adjacent building.

2.05 Portland Cement: Portland cement shall conform to Specifications for Portland Cement, ASTM C-150-68, Types I or II.

2.06 Mortar: Mortar shall conform to Specifications for Mortar for Unit Masonry, ASTM C-270-68, Types shall be as follows:

A. Type M: 1-part Portland Cement, 1-part Type II Masonry Cement, 4-parts sand by volume.

B. Type S: 2-part Portland Cement, 1-part Type II Masonry Cement, 4 2 parts sand by volume.

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2.07 Wall Reinforcement: Use ladder pattern, cold-drawn steel wire, ASTM A-82-66; hot-dipped galvanized after fabrication, ASTM A-153, Class B-2, #9 side rods, and #9 cross ties. Ladder type. At door and window openings, provide reinforcing at first and second block coursing above and below opening. Carry beyond opening 24" into adjoining wall assembly. Provide pre-fabricated corner.

2.08 Corrugated Metal Ties: 1" x 10" x 10 ga. **Galvanized. Use only where shown or called for on Drawings and Details.**

2.09 Precast Lintels: 8" Bearing minimum. Provide color match to block used for wall assembly.

2.10 Brick Veneer: Brick veneer traditional red brick tumbled (rough edges). Contractor to obtain brick samples within three days of bid for approval and ordering within 24 hours of the Notice to Proceed.

2.11 Filled Cells: Provide minimum 2500 psi grout fill conforming to ASTM C476 in all vertical reinforced masonry cells. (Contractor may elect to grout solid in strict conformance with ASTM C476 (ACI 530-95, Table 3.1.2 footnote #1.)

2.12 Split-Face CMU: Coastal / Old Castle, size to be 8x8x16 wide with intermediate vertical score. Mortar match split-face units.

3.0 EXECUTION

3.01 General: Work shall be performed by skilled personnel, experienced in the use of the specified materials to the best advantage and appearance when judged according to the accepted practice of the trade. No masonry shall be laid when the temperature is below 40 degrees Fahrenheit at the point of work. General Contractor and his superintendent are to monitor workmanship daily and advise mason of any and all work that is not acceptable prior to Owner and Architect having work removed and reinstalled.

3.02 Bonding and Coursing: Horizontal coursing shall be level; and vertical lines, joints and surfaces shall be plumb. Use running bond with 8" +/- coursing vertically. Use concave joint at all exposed block locations. All joints to be equally spaced with full head and bed joint of consistent width.

3.03 Mortar Bedding and Joints: Use Type M Portland Cement below-grade and Type S gray Portland Cement above grade.

3.04 Time and Temperature Limits: Place mortar in final position within 1-1/2 hours after mixing when the air temperature is 80 degrees Fahrenheit or higher; and within the 2-1/2 hours when the air temperature is less than 80 degrees Fahrenheit.

3.05 Retempering: Retemper mortars that have stiffened within the allowable time limit because of moisture evaporation, by adding water as frequently as needed to produce the proper workability.

3.06 Joint Reinforcement: Install joint reinforcement continuous at 16" o.c. vertically in concrete block walls. Use Masonry interlock of 50% at all wall intersections. Use galvanized truss type Dur-A-Wall or approved equal. Provide fabricated “L” and “T” sections at corners and

intersections as detailed.

3.07 Practices to be Avoided: Avoid high leads, excessive toothing, excessive racking back, mortar left to harden on surfaces and the laying of damaged or defective units.

3.08 Protection: Protect masonry from inclement weather during storage and construction; and protect complete work from damage. Cover all masonry with polyethylene film whenever concrete is to be poured adjacent to the masonry work.

3.09 Pointing and Cleaning: Point-up exterior masonry and wire brush at the end of each day. Allow the mortar to cure before cleaning. Contractor is to ensure Mason is responsible for cleaning of masonry and is responsible for inspection of workmanship on a daily basis.

3.10 Concrete Block Brick Veneer or Split-Face Block: Clean with water and stiff fiber brushes at the end of each day as a minimum practice. Use a rubbing stone only where necessary to remove stubborn fins or droppings. Wire brushes are prohibited.

4.0 INSTALLATION

4.01 Workmanship shall be of the highest quality.
Masonry laid horizontal and vertical joints and faces plumb and true. Head joints must be vertical full height of wall. Work with “Story Pole” limit “toothing” and “racking.” No masonry leads higher than the run of the wall at the end of the day.

4.02 Cover all masonry walls at the end of the work day during inclement weather, with waterproof material 12" wider than the wall.

4.03 Cutting of block is required.

4.04 Coordinate with the Electric/Mechanical/Plumbing, Roofing, and other trades for installation of their work.

4.05 Build in door, window frames, and grout solid.

4.06 Build in steel angle lintel and other miscellaneous metals.

4.07 Furnish and set precast lintel in full bed of mortar. 8" minimum bearing.

4.08 No admixture is permitted.

4.09 Masons will be responsible for the cleaning of all masonry which is to be executed at the end of each workday.

5.0 WORK INSTALLED BUT FURNISHED UNDER OTHER SECTIONS:

5.01 Precast entablature, caps and trim to be tinted precast concrete size and profile as noted or implied on drawings.

5.02 Steel angles and miscellaneous metals.

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5.04 Flashings, riglets

6.0 PLACING AND BONDING:

6.01 Masonry shall be stacked with suitable covering to protect them from weather: Laid in full bed of mortar: bonded at each corner and intersection of walls.

6.02 Block masonry work shall incorporate reinforcing bars as shown on drawings. Each bar shall be tied to the adjacent member with a minimum 48 bar diameter lap prior to being poured solid from footing to beam, run wall horizontal reinforcement through cells to be poured.

6.03 Horizontal joint reinforcing laid 12" end lap.

6.04 Control Joint in Walls: neoprene rods one and one half size of joint surface caulked with silicone. Locate ± 25'-0" o.c. coordinate with Architect prior to installation to allow coordination with wall penetrations and/or decorative wall patterns.

6.05 Build in weep hole using aluminum or galvanized steel tubes. Locate at bottom of brick at finish grade and sidewalks or at foundations.

6.06 Build in cavity vents at 4'0" o.c. at tie beam.

7.0 COURSING

7.01 Lay block running bond, face to line, with tooled horizontal and vertical joints.

7.02 Use masonry interlock of 50% at all wall intersections.

7.03 Use inspection and clean out holes at bottom of wall if over 5 foot grout lift is used.

8.0 TOLERANCE

8.01 Plumb = 1/4" wall height. Level coursing = 1/8" in 4'0", 1/4" full wall. Joint thickness = 1/8" max. Plane of wall = 1/4" max. Thickness of wall = 1/4" max.

9.0 CONTROL JOINTS

9.01 Control joints are required and not to exceed 25'-0" max. Form control joint by the use of sheet of felt bond breaker. Stop wall reinforcing. Pack vertical joint with rod and caulk. Color to match masonry.

10.0 WATERPROOFING

10.01 Waterproofing of brick shall be as specified under Painting Section 09900.

(END OF SECTION 04100)

SECTION 04200 - CONCRETE UNIT MASONRY

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 unit masonry assemblies consisting of the following:
1. Concrete masonry units (CMU).
2. Mortar and grout.
3. Reinforcing steel.
4. Masonry joint reinforcement.
5. Miscellaneous masonry accessories.

B. Related Sections include the following:
1. Section 03010: Cast-In-Place Concrete
2. Section 04200: Concrete Unit Masonry
3. Section 07920: Sealants and Caulking

1.3 STANDARDS & CODES

Standards:
ASTM - American Society for Testing Materials
SCPI - Structural Clay Products Institute
FCPA - Florida Concrete and Products Association

Codes:
MASONRY CEMENT ASTM C-91
PORTLAND CEMENT ASTM C0150 SAND M
SAND 210 ASTM - Use clean, sharp white mortar sand
BLOCK, REGULAR WT.ASTM C-129 with Aggregate ATM C-33
BLOCK, LIGHT WT. ASTM C-90 with 100% ASTM C-331 Aggregate

1.4 PERFORMANCE REQUIREMENTS

A. Provide unit masonry that develops indicated net-area compressive strengths (f'_m) at 28 days.

B. Determine net-area compressive strength (f'_m) 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.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For the following:
1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."

C. Qualification Data: For testing agency.

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D. Material Certificates: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. Provide for each type and size of the following:
   1. Masonry units.
      a. Include material test reports substantiating compliance with requirements.
      b. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
   2. Cementitious materials. Include brand, type, and name of manufacturer.
   3. Grout mixes. Include description of type and proportions of ingredients.
   4. Reinforcing bars.
   5. Joint reinforcement.
   6. Anchors, ties, and metal accessories.

E. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
   1. Include test reports, per ASTM C 780, for mortar mixes required to comply with property specification.
   2. Include test reports, per ASTM C 1019, for grout mixes required to comply with compressive strength requirement.

F. 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.

G. Cold-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with cold-weather requirements.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1093 for testing indicated, as documented according to ASTM E 548.

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, through one source from a 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 a single manufacturer for each cementitious component and from one source or producer for each aggregate.

D. Fire-Resistance Ratings: Where indicated, provide materials and construction identical to those of assemblies with fire-resistance ratings determined per ASTM E 119 by a testing and inspecting agency, by equivalent concrete masonry thickness, or by other means, as acceptable to authorities having jurisdiction.

E. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "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.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

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C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
D. 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 and hold cover securely in place.
B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.
C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
1. Protect base of walls from rain-splashed mud and from mortar splatter by 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.
1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.
E. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6.
F. No admixture is permitted

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
1. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
2. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.2 MASONRY UNITS, GENERAL
A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to exceed tolerances and to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not uses units where such defects, including dimensions that vary from specified dimensions by more than

SECTION 04200 - CONCRETE UNIT MASONRY

stated tolerances, will be exposed in the completed Work or will impair the quality of completed masonry.

2.3 CONCRETE MASONRY UNITS (CMU)

A. Shapes: Provide shapes indicated and as follows:
   1. Provide special shapes for lintels, corners, jambs, sashes, movement joints, headers, bonding, and other special conditions.
   2. Provide radiused/rounded edged units for outside corners, unless otherwise indicated.

B. Concrete Masonry Units: ASTM C 90.
   1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 1500 psi .
   2. Weight Classification: Normal weight, unless otherwise indicated.
   3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.
   4. Chipped and damaged or deformed units to be culled and removed from the jobsite unless other arrangements have been agreed to by Owner and Architect

2.4 CONCRETE AND MASONRY LINTELS

A. General: Provide either concrete or masonry lintels as indicated on the structural drawings.

B. Concrete Lintels: Precast units made from concrete matching concrete masonry units in color, texture, and compressive strength and with reinforcing bars indicated or required to support loads indicated. Cure precast lintels by same method used for concrete masonry units.

C. Concrete Lintels: Precast or formed-in-place concrete lintels complying with requirements in Division 3 Section "Cast-in-Place Concrete."

D. Masonry Lintels: Built-in-place masonry lintels made from bond beam concrete masonry units with reinforcing bars placed as indicated and filled with coarse grout. Temporarily support built-in-place lintels until cured.

2.5 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of Portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207, Type S.

D. Masonry Cement: ASTM C 91.
   1. Products:
      a. Capital Materials Corporation; Flamingo Color Masonry Cement.
      b. Essroc Italcementi Group
      c. Holcim (US) Inc.
      d. Lafarge North America Inc.
      e. Lehigh Cement Company.
      f. National Cement Company, Inc.; Coosa Masonry Cement.

E. Mortar Cement: ASTM C 1329.
   1. Products:
      a. Lafarge North America Inc.;

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F. Aggregate for Mortar: ASTM C 144.
G. Aggregate for Grout: ASTM C 404.
H. Cold-Weather Admixture: Non-chloride, noncorrosive, accelerating admixture complying with ASTM C 494/C 494M, Type C, and recommended by manufacturer for use in masonry mortar of composition indicated.
   1. Products:
      a. Addiment Incorporated; Mortar Kick.
      b. Euclid Chemical Company (The); Accelguard 80.
      c. Grace Construction Products, a unit of W. R. Grace & Co. - Conn.; Morset.
      d. Sonneborn, Div. of ChemRex; Trimix-NCA.
I. Water: Potable.

2.6 REINFORCEMENT
A. Uncoated Steel Reinforcing Bars: ASTM A 615, Grade 60.
B. Masonry Joint Reinforcement, General: ASTM A 951.
   1. Interior Walls: Galvanized, carbon steel.
   2. Exterior Walls: Galvanized, carbon steel.
   3. Wire Size for Side Rods: #9.
   4. Wire Size for Cross Rods: #9.
   5. Spacing of Cross Rods, Tabs, and Cross Ties: Not more than 16 inches o.c.
   6. Provide in lengths of not less than 10 feet**,** with prefabricated corner and tee units.
C. Masonry Joint Reinforcement for Single-Wythe Masonry: Ladder type with single pair of side rods.

2.7 TIES AND ANCHORS(Where applicable)
A. Materials: Provide ties and anchors specified in subsequent paragraphs that are made from materials that comply with subparagraphs below, unless otherwise indicated.
   1. Mill-Galvanized, Carbon-Steel Wire: ASTM A 82; with ASTM A 641, Class 1 coating.
   2. Hot-Dip Galvanized, Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.
   3. Stainless-Steel Wire: ASTM A 580, Type 304.
   4. Galvanized Steel Sheet: ASTM A 653, Commercial Steel, G60 zinc coating.
   5. Steel Sheet, Galvanized after Fabrication: ASTM A 1008, Commercial Steel, hot-dip galvanized after fabrication to comply with ASTM A 153.
   6. Stainless-Steel Sheet: ASTM A 666, Type 304.
   7. Steel Plates, Shapes, and Bars: ASTM A 36.
B. Corrugated Metal Ties: Metal strips not less than 7/8 inch wide with corrugations having a wavelength of 0.3 to 0.5 inch and an amplitude of 0.06 to 0.10 inch made from steel sheet, galvanized after fabrication not less than 0.043 inch thick.
C. Adjustable Anchors for Connecting to Structure: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.
   1. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch-diameter, galvanized steel wire.
   2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.188-inch**-**diameter, galvanized steel wire.

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3. Connector Section for Concrete: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from 0.053-inch-thick, steel sheet, galvanized after fabrication.
4. Tie Section for Concrete: Corrugated metal ties with dovetail tabs for inserting into dovetail slots in concrete and sized to extend to within 1 inch of masonry face.

2.8 MISCELLANEOUS ANCHORS

A. Unit Type Inserts in Concrete: Cast-iron or malleable-iron wedge-type inserts.

B. Dovetail Slots in Concrete: Furnish dovetail slots with filler strips, of slot size indicated, fabricated from 0.034-inch, galvanized steel sheet.

C. Anchor Bolts: L-shaped steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of dimensions indicated.

D. Post-installed Anchors: Provide chemical anchors, with capability to sustain, without failure, a load equal to six times the load imposed when installed in solid or grouted unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
   1. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (5 microns) for Class SC 1 service condition (mild).

2.9 MISCELLANEOUS MASONRY ACCESSORIES

A. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells. Units are formed from 0.142-inch steel wire, hot-dip galvanized after fabrication. Provide units with either two loops or four loops as needed for number of bars indicated.
   1. Products:
      a. Dayton Superior Corporation, Dur-O-Wal Division; D/A 810, D/A 812 or D/A 817.
      b. Heckmann Building Products Inc.; No. 376 Rebar Positioner.
      c. Hohmann & Barnard, Inc.; #RB or #RB-Twin Rebar Positioner.
      d. Wire-Bond; O-Ring or Double O-Ring Rebar Positioner.

2.10 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.

2.11 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.

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1. Do not use calcium chloride in mortar or grout.
2. Limit cementitious materials in mortar for exterior and reinforced masonry to Portland cement and lime.

B. Grout for Unit Masonry: Comply with ASTM C 476.
1. Use grout of type indicated or, if not otherwise indicated, of type (fine, or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6 for dimensions of grout spaces and pour height.
2. Provide grout with a slump of 8 to 11 inches as measured according to ASTM C 143.

C. Epoxy Pointing Mortar: Mix epoxy pointing mortar to comply with mortar manufacturer's written instructions.

2.12 SOURCE QUALITY CONTROL

A. Owner will engage a qualified independent testing agency to perform source quality-control testing as indicated below:

B. Concrete Masonry Unit Test: For each type of unit furnished, per ASTM C 140.

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 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 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, un-chipped 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. Comply with construction tolerances in ACI 530.1/ASCE 6.

3.3 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.

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B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in bond pattern indicated on Drawings; 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, unless otherwise indicated.

F. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.

G. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.
   1. Install compressible filler in joint between top of partition and underside of structure above.
   2. Fasten partition to structure above.
   3. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Division 7 Section "Fire-Resistive Joint Systems."
   4. Cutting of block is required. Excessive cuts to accommodate wall penetrations will be rejected.

3.4 MORTAR BEDDING AND JOINTING

A. Lay concrete masonry units as follows:
   1. With face shells fully bedded in mortar and with head joints of depth equal to bed joints.
   2. With webs fully bedded in mortar in all courses of piers, columns, and pilasters.
   3. With webs fully bedded in mortar in grouted masonry, including starting course on footings.

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.

C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

3.5 MASONRY JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.
   1. Space reinforcement not more than 16 inches o.c.
   2. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings.

B. Interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units.

E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

SECTION 04200 - CONCRETE UNIT MASONRY

3.6 ANCHORING MASONRY TO STRUCTURAL MEMBERS

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:
   1. Anchor masonry to structural members with anchors embedded in masonry joints and attached to structure.
   2. Space anchors as indicated, but not more than 24 inches o.c. vertically and 36 inches o.c. horizontally.

3.7 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. Fit bond-breaker strips into hollow contour in ends of concrete masonry units on one side of control joint. Fill resultant core with grout and rake out joints in exposed faces for application of sealant.
   2. Install preformed control-joint gaskets designed to fit standard sash block.
   3. Install interlocking units designed for control joints. Install bond-breaker strips at joint. Keep head joints free and clear of mortar or rake out joint for application of sealant.
   4. Install temporary foam-plastic filler in head joints and remove filler when unit masonry is complete for application of sealant.
   5. Neoprene rods one and one half size of joint surface caulked with silicone. Locate ±25'-0" to 50'-0" o.c. coordinate with Architect prior to installation to allow for coordination with wall penetrations or decorative wall patterns.

3.8 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 temporary loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements in ACI 530.1/ASCE 6.

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 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.

3.9 FIELD QUALITY CONTROL

A. Inspectors: Owner will engage qualified independent inspectors to perform inspections and prepare reports. Allow inspectors access to scaffolding and work areas, as needed to perform inspections.
   1. Place grout only after inspectors have verified compliance of grout spaces and grades, sizes, and locations of reinforcement.

SECTION 04200 - CONCRETE UNIT MASONRY

B. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections indicated below and prepare test reports.
C. Testing Frequency: One set of tests for each 5000 sq. ft. of wall area or portion thereof.
D. Concrete Masonry Unit Test: For each type of unit provided, per ASTM C 140.
E. Mortar Test (Property Specification): For each mix provided, per ASTM C 780.
F. Grout Test (Compressive Strength): For each mix provided, per ASTM C 1019.
G. Prism Test: For each type of construction provided, per ASTM C 1314 at 7 days and at 28 days.
H. Tolerance:
- Plumb = ¼" wall height. Level coursing = 1/8" in 4'0", ¼" full wall. Joint thickness = 1/8" max. Plane of wall = ¼" max. Thickness of wall = ¼" max.
- Concrete Masonry units with chips and cosmetic blemishing are only to be used in electrical, mechanical and service closets.

I. Control Joints are required and not to exceed 25'-0" max. Form control joint by the use of sheet of felt bond breaker. Stop wall reinforcing. Pack vertical joint with rod and caulk. Color to match masonry.

3.10 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 daily 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. Use a rubbing stone only where necessary and wire brushes are prohibited.
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. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
4. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces. Contractor to inspect the masons work daily and point out workmanship concerns and issues that need to be corrected before additional work is restarted.

(END OF SECTION 04200)

SECTION 05500 - MISCELLANEOUS METALS

1.0 SCOPE

1.01 This Section of the Specifications is intended to cover the furnishing of all labor, materials, equipment and incidentals necessary to the completion of all requirements of the drawings, notes, schedules and these specifications as relates to interior and exterior miscellaneous aluminum and steel items as required for the building completion.

1.02 Intent of this specification is that where a particular item of metal work is called for under any other division, it shall be furnished under that Division, and that all other metal items not so covered shall be furnished under this Section. This is specifically not intended to relieve General Contractor of the responsibility of furnishing and installing all items of metal work called for on the drawings and specifications as a whole.

1.03 Verify the extent of all items to be furnished, their required shapes and sizes, and the sequence with which these items are to be furnished and installed. Furnish to job site sorted, tagged, and grouped according to usage.

1.04 Furnish to appropriate trades all anchors, sleeves or fastenings required to be built into their work as their work progresses.

1.05 Various metal items, in conjunction with other trades are not included here, but are specified elsewhere in those appropriate trade sections. This includes such items as anchor bolts, sheet metal work, and sleeves and hangers for mechanical and electrical work.

1.06 Related Work Specified and Performed Under Other Sections:
A. Section 09900 - Painting

1.07 References:
A. ASTM Standards and Test Procedures as referenced herein.
B. AWS D1.1 - Structural Welding Code.
C. Military Specifications (MIL) as referenced herein.

2.0 SHOP DRAWINGS and SAMPLES

2.01 Complete and detailed Shop Drawings indicating profile, locations, size, material, finish and details of installation of each fabricated item, and lists of all unfabricated items, shall be submitted for approval. No fabrication shall be done until approval of Shop Drawings is obtained.

2.02 Samples of materials shall be submitted where called for.

3.0 MATERIALS

3.01 Materials shall conform to the latest edition of the standard specifications listed below. Standard manufactured items of a different construction or type from that shown on the Drawings, but substantially meeting the requirements specified may be acceptable provided written approval of the Architect is obtained prior to purchase.

3.02 Verify all measurements and take all field measurements necessary to ensure accurate fitting of the work.

SECTION 05500 - MISCELLANEOUS METALS

3.03 Standard Specifications:
- A. Structural Steel Shapes, Plates, and Bars: ASTM Designation A-36.
- B. Rivet Steel: ASTM Designation A-141
- C. Steel Pipe: ASTM Designation A-53 Types E or S Grade B.
- D. Pipe Sleeves: ASTM Designation A-120.
- E. Steel Tube: ASTM Designation A-500 Grade B.
- F. Galvanizing of Plates, Bars, and Fabricated Assemblies: ASTM Designation A-123.
- G. Cast Iron: ASTM Designation A-48 for grey iron castings; and A-47 for malleable iron castings.
- H. Aluminum: US alloy 6063.

4.0 MISCELLANEOUS METAL ITEMS

4.01 Loose Lintels and Shelf Angles: Furnish loose lintels and shelf angles as indicated on drawings for openings which do not receive precast concrete or masonry lintels. Shop paint according to the requirements of these Specifications. Set to course with masonry. Provide all bolts, nuts, and anchors as indicated on drawings.

4.02 Equipment and Accessory Support Angles: Furnish loose angles, channels, etc., at all exhaust fan roof curb openings, roof drain supports, or any other framing required around roof openings, whether specifically shown on drawings or not.

5.0 MISCELLANEOUS STEEL ITEMS

5.01 Anchor Bolts shall be furnished wherever necessary for anchoring steel to concrete or masonry, and wood to steel.

5.02 Steel Anchor Plates shall be furnished and installed where called for on the drawings.

5.03 Steel Angles shall be provided where indicated, but not limited to the drawings to insure the secure support of new equipment or building systems.

5.04 Steel Angle Support Frames shall be provided for all miscellaneous items.

(END OF SECTION 05500)

SECTION 05700 – ORNAMENTAL RAILINGS, VEGETATION PANELS AND GRILLES

SCOPE

1.01 This Section of the Specifications is intended to cover the furnishing of all labor, materials, equipment, and/or incidentals necessary to the completion of all requirements of the drawings, notes, schedules, and these specifications concerning ornamental fencing, gates and grilles including all posts, brackets, and accessories and the installation thereof.

1.0 SHOP DRAWINGS and SAMPLES

2.01 Complete and detailed Shop Drawings indicating profile, locations, size, material, finish, and details of installation of all handrails and accessories shall be submitted for approval. No fabrication shall be done until approval of Shop Drawings is obtained.

2.0 DESIGN CRITERIA

3.01 All fencing and gates shall be designed, manufactured and installed to carry 200 pounds per linear foot downward force at top rail, 50 pounds per linear foot horizontal force applied at the top rail and 25 pounds per square foot at center panel sections.

4.0 RAILS, PANELS, and GRILLES

4.01 Furnish and install fence, vegetation panels, and grilles of sizes as shown on the drawings. Ornamental panels and / or grilles are elevated on the associated drawings. Products and grilles by other manufacturers or fabricators meeting these specifications will be acceptable. Rails, Vegetation panels and grilles shall be manufactured from galvanized steel or heavy-duty aluminum, load specifications as per the above specified with a baked on polyester resin coating. Color to be selected by Architect. All connections will be either welded or riveted where appropriate and provide anchoring systems to accommodate the field connection.

4.02 Components: Rails, panels and grilles shall be Liston model or equal with vertical elements of cold pre-bent tubular steel 3/4" diameter gauge 0.060 inches. Horizontal elements one tubular steel diameter 1-1/8” gauge 0.060 unless specified otherwise.

4.03 Vegetation Panels: panels to be 3’-0” x 7’-0” high (9 panels ganged together as shown on drawings).

5.0 PRODUCTS

5.01 Sundance Architectural Products, Orlando, Florida (407) 927-1337 or approved equal refer to section 01100 Alternates & Substitutes.

6.0 INSTALLATION and WORKMANSHIP

6.01 All work shall be of the finest quality and shall be fabricated in a shop whose principal business is the manufacture of the highest-grade ornamental metal work.

6.02 Panels, gates, and grilles shall be shipped completely pre-finished with all necessary accessories, ready for installation.

SECTION 05700 – ORNAMENTAL RAILINGS, VEGETATION PANELS AND GRILLES

6.03 The panels, gates and grilles shall be rigidly and securely installed in a first-class manner by mechanics experienced in the erection of ornamental metal. All fasteners, screws, and fittings shall be drawn tightly.

6.04 Joints shall be accurately machined to be sharp and true and free from discolorations, Welds to be ground smoother prior to receiving protective coatings.

6.05 Caulk all joints and gapes of dissimilar materials the metal will penetrate to achieve its intended anchoring surfaces to insure a watertight installation.

(END OF SECTION 05700)

SECTION 06100 - ROUGH CARPENTRY

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 Description of Work: This Section of the Specifications is intended to cover the furnishing of all labor, materials, and/or incidentals necessary to the completion of all requirements of the Drawings and Specifications concerning Rough Carpentry.

1.03 Codes and Standards:

A.	MIL-L-1914-C	Lumber and Plywood Fire Retardant
B.	MIL-V-13518G(1)	Wood Preservative
C.	P.S. 51	Hardwood and Decorative Plywood
D.	P.S. 58	Basic Hardwood
E.	NFPA	National Design Specification for Wood Construction
F.	P.S. 20	American Soft Wood Lumber Standard
G.	APA	American Plywood Association
H.	SPA	Southern Pine Association
I.	SPIB	Southern pine Inspection Bureau (grading rules)
J.	SPR	Simplified Practice Regulations, U. S. Department of Commerce
K.	NLMA	National Lumber Manufacturers Association
L.	AWPA	American Wood Preservers Association
M.	FS	Federal Specifications, General Services Administration
N.	UL	Underwriters' Laboratories, Inc.
O.	ASTM	American Society for Testing and Materials
P.	NPA	National Particleboard Association

2.0 MATERIALS

2.01 Wood framing is not permitted. Wood decking is permitted only if a metal roof deck is installed to create a barrier between the wood sheathing and the building itself.

2.02 Blocking nailers, etc., shall be #2 common or better Yellow Pine S4S, as graded by the Southern Pine Inspection Bureau. Provide #2 common or better Yellow Pine, pressure treated S4S for all eave boards. Any wood in contact with masonry or concrete shall be pressure-treated.

2.03 Rough Carpentry: All framing lumber shall be pressure-treated, including ledgers, stripping, blocking, furring and other nailers. Treatment for termites and fungi shall be done by a member plant of AWPA, according to FS TT-W-571g for Treating Lumber in Use Not in Contact with Earth or in Water, by the full cell process, to a net dry retention of:

A. 0.35 lbs./cu. ft. for chromated copper arsenate
B. 0.50 lbs./cu. ft. for chromated zinc arsenate
C. 0.50 lbs./cu. ft. for acid chromate

2.04 Any framing lumber, nailers, or blocking with excessive twist, bow or other defect that will cause the finish applied over it to be unsightly will be rejected and shall not be incorporated into the work.

SECTION 06100 - ROUGH CARPENTRY

2.05 All material shall be delivered in a dried condition and shall be kept covered and dry until set in place in the building.

2.06 The Architect reserves the right under this Specification to reject any individual pieces of lumber which, because of the location of knots or defects, might render them structurally unsound for the particular place in which they are intended for use.

3.0 CONSTRUCTION

3.01 Plates and other blocking, in contact with concrete, shall be fastened at 4'-0" center with heavy powder driven studs, unless otherwise noted. Sole plates shall be single, and top plates double.

3.02 Furring to be metal.

4.0 ROUGH HARDWARE AND CARPENTER'S IRONWORK

4.01 Furnish and install all nails, screws, bolts, anchors, etc., as may be required for fastening all woodwork, or securing all blocking, furring, or rough finish woodwork to other materials.

4.02 Bolts shall be of size and spacing as called for on the Drawings. In no instance shall bolts be less than 3/8" in diameter.

4.03 All framing, except as otherwise noted, shall be fastened with common nails whose length shall be twice the thickness of the piece to be nailed plus 1". All nails driven through shall be clinched. Stagger where applicable.

4.04 Rough galvanized nails of appropriate type, size and length as needed shall be used in all exterior permanent framing where resistance to pressures on the nails are considered critical (built-up beams, columns, etc.). Smooth galvanized nails of appropriate type, size and length may be used in all interior framing and other temporary work.

4.05 All fastening shall be as required by the Florida Building Code 8th Edition as a minimum.

(END OF SECTION 06100)

SECTION 06200 - FINISH CARPENTRY

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 Description of Work: This Section of the Specifications is intended to cover the furnishing of all labor, materials and/or incidentals necessary to the completion of all requirements of the Drawings, notes, schedules, and these Specifications concerning finish carpentry and other finish materials of similar nature usually part of the carpentry trade.

1.03 Any variation from the work, as detailed, must be submitted as Shop Drawings and written approval secured before starting work. Failure to do this will be considered sufficient cause for rejection. In all cases, shapes and dimensions shall be followed where shown.

1.04 Field measurements of all features which may be affected by construction of the building shall be checked by the Contractor and shall govern his fabrication. He shall report any serious discrepancies before proceeding with the work.

2.0 PERFORMANCE EXPECTED

2.01 All carpentry and millwork shall be done in accordance with the requirements of the Drawings and in such a manner as to ensure the following.

2.02 All wood materials shall be sufficiently seasoned to prevent unsightly shrinkage, warpage or twisting after being installed.

2.03 All wood finishing shall be free of machine or tool marks when finally placed, and shall be as free of natural defects, such as knots, checks, wane, etc., as might be normally expected of the grade specified when judged by generally accepted standards of wood grading.

2.04 Milling and finish joinery shall be such as to present smooth finish surfaces and close tight-fitting joints.

2.05 Hardware shall be so installed as to provide for the smooth workable operation of all moveable parts.

2.06 All carpentry and millwork shall be plumb and square, with all lines horizontal and true rigidly secured in place.

3.0 MATERIALS

3.01 All finish woods shall be selected from well-seasoned and kiln dried stock, with a moisture content of not more than 15 percent. Wood shall be worked to conform to details.

3.02 Where no mention of grades is made, finishes shall be clear, the best of their respective kinds. This material will be finished natural so that care must be taken in selecting each individual piece.

3.03 Interior standing trim, unless otherwise called for, shall be clear, "B" or better Fir or Larch.

SECTION 06200 - FINISH CARPENTRY

Trim at special areas shall be of the same species of wood as the base material being trimmed out.

4.0 INSTALLATION OF WOOD DOORS

4.01 Wood doors are specified under *Section 08200 - Wood Composition and Wood Doors* of this Project Manual but shall be installed under work of this Section.

4.02 Doors in general shall be hung with equal margins and shall, when closed, bear equally on all stops. Entire assemble shall swing freely and latch easily.

5.0 APPLICATION OF FINISH HARDWARE

5.01 Finish hardware is specified under *Section 08700 - Finish Hardware* of this Project Manual but shall be installed by skilled mechanics under work of this Section.

5.02 Application of finish hardware shall be made in accordance with the Manufacturer's directions and templates and executed in a neat and first-class workmanlike manner.

6.0 WORKMANSHIP

6.01 Where possible, all finish carpentry shall be mill-made, and shall be performed by skilled workmen.

6.02 Trim shall be protected from moisture and shall be stored and handled in such a manner as to be protected from scratching or marking.

6.03 Trim shall be sanded before delivery and shall be hand sanded and smoothed on the job.

6.04 Door frames and similar trim shall be delivered to the job knocked down.

6.05 All trim shall be according to detail, or in the absence of details, according to the best-recognized millwork practice.

6.06 Running trim shall not be spliced unless the length of the member is over 12'. The shortest part of any spliced trim shall not be less than 3'.

6.07 All square-edged trim shall have tight butt joints, and molded trim shall have mitered joints.

6.08 All joints exposed to weather and all wood trim set against masonry shall be painted with a priming coat on all surfaces.

6.09 All joints shall be glued and screwed, or nailed as conditions permit.

6.10 Furnish and install all nails, screws, etc., as may be required to fastening all woodwork to other material. All nails shall be set.

(END OF SECTION 06200)

SECTION 07115 – BITUMINOUS DAMPPROOFING

1.0 GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

A. This Section includes cold-applied, cut-back and cold-applied, emulsified-asphalt dampproofing applied to the following surfaces:
   1. Exterior, below-grade surfaces of concrete and masonry foundation walls
   2. Exterior face of the inner wythe of the exterior masonry cavity walls
   3. Interior face of exterior masonry walls, above grade

1.03 SUBMITTALS

A. Product Data: For each type of product indicated. Include recommendations for method of application, primer, number of coats, coverage or thickness, and protection course.

1.04 QUALITY ASSURANCE

A. Source Limitations: Obtain primary dampproofing materials and primers through one source from a single manufacturer. Provide secondary materials recommended by manufacturer of primary materials.

B. Installer Qualifications: Engage an experienced Installer who has completed bituminous dampproofing similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

C. Contractor shall ensure that dampproofing materials, where shown to be in contact, are compatible with the cavity wall insulation specified under Section 04200 - UNIT MASONRY.

1.05 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt dampproofing to be performed according to manufacturers' written instructions.

B. Substrate: Proceed with dampproofing only after substrate construction and penetrating work have been completed.

C. Ventilation: Provide adequate ventilation during application of dampproofing in enclosed spaces. Maintain ventilation until dampproofing has thoroughly cured.

2.0 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Karnak Corporation.
   2. Lambert Corporation.
   3. Meadows, W. R., Inc.
   4. Sonneborn, Div. of BASF, Inc.

2.02 BITUMINOUS DAMPPROOFING

SECTION 07115 – BITUMINOUS DAMPPROOFING

A. Cold-Applied, Emulsified-Asphalt Dampproofing:
   1. Brush (Semi mastic) Coats: ASTM D 1227, Type II or Type III, Class 1.
B. Spray application is not permitted for this Project.

2.03 MISCELLANEOUS MATERIALS
A. Emulsified-Asphalt Primer: ASTM D 1227, Type III, Class 1, except diluted with water as recommended by manufacturer.
B. Asphalt-Coated Glass Fabric: ASTM D 1668, Type I.

3.0 EXECUTION

3.01 EXAMINATION
A. Examine substrates, with Applicator present, for compliance with requirements for surface smoothness and other conditions affecting performance of work.
   1. Begin dampproofing application only after substrate construction and penetrating work have been completed and unsatisfactory conditions have been corrected.

3.02 PREPARATION
A. Protection of Other Work: Mask or otherwise protect adjoining exposed surfaces from being stained, spotted, or coated with dampproofing. Prevent dampproofing materials from entering and clogging weep holes and drains.
B. Clean substrates of projections and substances detrimental to work; fill voids, seal joints, and apply bond breakers if any, as recommended by prime material manufacturer.

3.03 APPLICATION, GENERAL
A. Comply with manufacturer's written recommendations unless more stringent requirements are indicated or required by Project conditions to ensure satisfactory performance of dampproofing.
   1. Apply additional coats if recommended by manufacturer or required to achieve coverages indicated.
   2. Allow each coat of dampproofing to cure 24 hours before applying subsequent coats.
B. Apply dampproofing to footings and foundation walls where opposite side of wall faces building interior whether indicated or not.
   1. Apply from finished-grade line to top of footing extend over top of footing, and down a minimum of 6 inches over outside face of footing.
   2. Extend 12 inches onto intersecting walls and footings, but do not extend onto surfaces exposed to view when Project is completed.
   3. Install flashings and corner protection stripping at internal and external corners, changes in plane, construction joints, cracks, and where shown as "reinforced," by embedding an 8-inch-wide strip of asphalt-coated glass fabric in a heavy coat of dampproofing. Dampproofing coat required for embedding fabric is in addition to other coats required.
C. Apply dampproofing to provide continuous plane of protection on exterior face of inner Wythe of exterior masonry cavity walls.
   1. Lap the dampproofing at least 1/4 inch onto flashing, masonry reinforcement, veneer ties, and other items that penetrate inner wythe.

SECTION 07115 – BITUMINOUS DAMPPROOFING

2. Extend dampproofing over outer face of structural members and concrete slabs that interrupt inner wythe, and lap dampproofing at least 1/4 inch onto shelf angles supporting veneer.

D. Apply dampproofing to provide continuous plane of protection on interior face of above grade, exterior single-wythe masonry walls unless walls are indicated to receive direct application of paint.
1. Continue dampproofing through intersecting walls by keeping vertical mortar joints at intersection temporarily open or by delaying construction of intersecting walls until dampproofing is applied.

E. Provide cold-applied, cut-back asphalt dampproofing at below grade applications and cold-applied, emulsified-asphalt dampproofing at above grade applications, unless otherwise indicated.

3.04 COLD-APPLIED, EMULSIFIED-ASPHALT DAMPPROOFING

A. Semimastic Grade: Brush apply a coat of asphalt emulsion dampproofing at a rate of 5 gal./100 sq. ft., to produce a uniform, dry-film thickness of not less than 30 mils.

3.05 PROTECTION AND CLEANING

A. Protect exterior, below-grade dampproofing membrane from damage until backfill is completed. Remove dampproofing materials from surfaces not intended to receive dampproofing.

(END OF SECTION 07115)

SECTION 07410 – METAL COMPOSITE MATERIAL WALL PANELS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section includes metal composite material wall panels.

1. Rout and Return Wet Seal.
2. Subgirts.
3. Miscellaneous Materials.

B. Related Sections:

1. Section 05120 “Structural Steel Framing”.
2. Section 09260 “Gypsum Drywall Finishing System” for exterior sheathing.
3. Section 07920 “Sealants and Caulking”
4. Section 07621 “Flashing and Sheet Metal”
5. Section 07050 “Membrane Dampproofing & Waterproofing Systems”

1.03 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Meet with Owner, Architect, Owner's insurer if applicable, metal composite material panel Installer, structural-support Installer, and installers whose work interfaces with or affects metal composite material 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 composite material panel installation, including manufacturer'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 affect metal composite material panels.
6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
7. Review temporary protection requirements for metal composite material panel assembly during and after installation.

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8. Review procedures for repair of panels damaged after installation.
9. Document proceedings, including corrective measures and actions required, and furnish a copy of the record to each participant.

1.04 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal composite material panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment assembly, trim, flashings, closures, and accessories; and special details.
2. Accessories: Include details of the flashing, trim and anchorage, at a scale of not less than 1-1/2 inches per 12 inches.

C. Samples for Initial Selection: For each type of metal composite material panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Metal Composite Material Panels: 12 inches long by actual panel width. Include fasteners, closures, and other metal composite material panel accessories.

E. Delegated-Design Submittal: For metal composite material wall panels attachment assembly system including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.05 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Test Reports: For each product, tests are performed by a qualified testing agency.

C. Field quality-control reports.

D. Sample Warranties: For special warranties.

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1.06 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal composite material panels to be included in maintenance manuals.

1.07 QUALITY ASSURANCE

A. Fabricator / Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by the manufacturer.

B. 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 metal composite material panel assembly, including corner, soffits, supports, attachments, and accessories.

a. Include four-way joint for metal faced composite wall panels.

2. Water-Spray Test: Conduct water-spray test of mockup of metal composite material panel assembly, testing for water penetration according to AAMA 501.2.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal composite material panels, and other manufactured items so as not to be damaged or deformed. Package metal composite material panels for protection during transportation and handling.

B. Unload, store, and erect metal composite material panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal composite material panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal composite material panels to ensure dryness, with positive slope for drainage of water. Do not store metal composite material panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal composite material panels during installation.

SECTION 07410 – METAL COMPOSITE MATERIAL WALL PANELS

1.09 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal composite material panels to be performed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements: To ensure accurate size, shape, joint alignment and proper fit of each individual panel, digital scanning shall be employed as the primary means of field-measuring the structure and substrate, before fabrication of the Metal Composite Material Panels may occur.

1.10 COORDINATION

A. Coordinate metal composite material panel installation with rain drainage work, flashing, trim, construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.11 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal composite material panel systems which 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 and other materials beyond normal weathering.

2. Warranty Period: 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 composite material panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

c. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
d. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
e. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion. Composite material manufacturer liability under this warranty or otherwise will be limited to refinishing, repairing or replacing at the manufacturer’s sole option, the defective material. The warranty on any refinished, replaced or repaired metal shall be for

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the remainder of the warranty. Applicable to the originally coated metal. All warranty work will be performed by a company selected by the ACM manufacturer.

2.0 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design attachment assembly system.

B. Structural Performance: Provide metal composite material panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 330:

1. Wind Loads: As indicated on Structural Drawings.
2. Other Design Loads: As indicated on Structural Drawings.
3. Deflection Limits: For wind loads, no greater than 1/175 of the span.

C. Air Infiltration: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 283 at the following test-pressure difference:

1. Test-Pressure Difference: 1.57 lbf/sq. ft.

D. Water Penetration under Static Pressure: No water penetration when tested according to ASTM E 331 at the following test-pressure difference:

1. Test-Pressure Difference: 6.24 lbf/sq. ft.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

F. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings from an applicable testing agency.

1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2. ACM to be produced through the continuous bonding of two thin skins of aluminum under tension to either side of a thermoplastics core, with a minimum density of 20lbs/ft3 as required by the international code council evaluation service acceptance criteria 25.

SECTION 07410 – METAL COMPOSITE MATERIAL WALL PANELS

2.02 METAL COMPOSITE MATERIAL WALL PANELS

A. Metal Composite Material Wall Panel Systems: Provide factory-formed and -assembled, metal composite material wall panels fabricated from two metal facings that are bonded to a solid, extruded thermoplastic core; formed into profile for installation method indicated. Include attachment assembly components, panel stiffeners, and accessories required for weathertight system.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Parallel Architectural wall panel system composite metal panels or comparable product by one of the following:
   a. ALPOLIC Composite Metal Panel; Mitsubishi Chemical America, Inc.
   b. CENTRIA Architectural Systems; FormaBond Wall System
   c. Firestone Metal Products, LLC; UNA-FAB Series 1000; Series 1500.

B. Aluminum-Faced Composite Wall Panels: Formed with 0.020-inch- thick, coil-coated aluminum sheet facings.
1. Panel Size: 8” and 12” widths.
2. Panel Thickness: 0.157 inch.
3. Exterior Finish: FEVE fluoropolymer paint finish or Kynar PVDF paint finish that meets or exceeds values expressed in AAMA 2605 where relevant to coil coatings.

   a. Colors: As selected by Architect from manufacturer's full range.

C. Attachment Assembly Components: Formed from extruded aluminum.

2.03 MISCELLANEOUS MATERIALS

A. Miscellaneous Metal Subframing, Subgirts and Furring: ASTM C 645, cold-formed, metallic-coated steel sheet ASTM A 653/A 653M, G90 coating designation or ASTM A 792/A 792M, Class AZ50 aluminum-zinc-alloy coating designation unless otherwise indicated. Provide manufacturer's standard sections as required for support and alignment of metal composite material panel system.

B. Panel Accessories: Provide components required for a complete, weathertight panel system including trim, copings, fascia, mullions, sills, corner units, clips, flashings, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal composite material panels unless otherwise indicated.

C. Flashing and Trim: Provide flashing and trim formed from same material as metal composite material panels as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, end walls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal composite material panels.

D. Panel Fasteners: Self-tapping screws designed to withstand design loads. Provide exposed fasteners with heads matching color of metal composite material panels by

means of plastic caps or factory-applied coating. Provide EPDM or PVC sealing washers for exposed fasteners.

E. Panel Sealants: ASTM C 920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal composite material panels and remain weathertight; and as recommended in writing by metal composite material panel manufacturer.

2.04 FABRICATION

A. General: Fabricate and finish metal composite material panels and accessories at the factory, by manufacturer'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.

B. Fabricate metal composite material panel joints with factory-installed captive gaskets or separator strips that provide a weathertight seal and prevent metal-to-metal contact, and that minimize noise from movements.

C Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's recommendations and recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated.

1. 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.
2. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.
3. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
4. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate sealant and to comply with SMACNA standards.
5. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
6. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended in writing by metal panel manufacturer.

    a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.05 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

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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 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. Aluminum Panels and Accessories:

1. FEVE fluoropolymer paint finish or Kynar PVDF paint finish that meets or exceeds values expressed in AAMA 2605 where relevant to coil coatings.

3.0 EXECUTION

3.01 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal composite material panel supports, and other conditions affecting performance of the Work.

1. Examine 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 composite material wall panel manufacturer.
2. Examine wall sheathing to verify that sheathing joints are supported by framing or blocking, and that installation is within flatness tolerances required by metal composite material wall panel manufacturer.

a. Verify that air- or water-resistive barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Examine roughing-in for components and assemblies penetrating metal composite material panels to verify actual locations of penetrations relative to seam locations of metal composite material panels before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Miscellaneous Supports: Install sub framing, furring, and other miscellaneous panel support members and anchorages according to ASTM C 754 and metal composite material panel manufacturer's written recommendations.

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B. Adjacent Surfaces Protection: Protect adjacent work areas and finish surfaces from damage during product installation.

3.03 METAL COMPOSITE MATERIAL PANEL INSTALLATION

A. General: Install metal composite material panels according to manufacturer's written instructions in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to supports unless otherwise indicated. Anchor metal composite material panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Shim or otherwise plumb substrates receiving metal composite material panels.
2. Flash and seal metal composite material panels at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until air- or water-resistive barriers and flashings that will be concealed by metal composite material panels are installed.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install flashing and trim as metal composite material panel work proceeds.
6. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
7. Align bottoms of metal composite material panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
8. Provide weathertight escutcheons for pipe- and conduit-penetrating panels.

B. Fasteners:

1. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal composite material panel manufacturer.

D. Attachment Assembly, General: Install attachment assembly required to support metal composite material wall panels and to provide a complete weathertight wall system, including subgirts, perimeter extrusions, tracks, drainage channels, panel clips, and anchor channels.

1. Include attachment to supports, panel-to-panel joinery, panel-to-dissimilar-material joinery, and panel-system joint seals.

E. Installation: Attach metal composite material wall panels to supports at locations, spacings, and with fasteners recommended by manufacturer to achieve performance requirements specified.

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1. Wet Seal Systems: Seal horizontal and vertical joints between adjacent metal composite material wall panels with sealant backing and sealant. Install sealant backing and sealant according to requirements specified in Section 079200 "Joint Sealants."

F. Clip Installation: Attach panel clips to supports at locations, spacings, and with fasteners recommended by manufacturer. Attach routed-and-returned flanges of wall panels to panel clips with manufacturer's standard fasteners.

1. Seal horizontal and vertical joints between adjacent panels with sealant backing and sealant. Install sealant backing and sealant according to requirements specified in Section 079200 "Joint Sealants."
2. Seal horizontal and vertical joints between adjacent metal composite material wall panels with manufacturer's standard gaskets.

G. Accessory Installation: Install accessories with positive anchorage to building and weathertight mounting and provide for thermal expansion. Coordinate installation with flashings and other components.

1. Install components required for a complete metal composite material panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items. Provide types indicated by metal composite material panel manufacturer; or, if not indicated, provide types recommended in writing by metal composite material panel manufacturer.

H. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible and set units true to line and level as indicated. Install work with laps, joints, and seams that are permanently watertight.

1. Install exposed flashing and trim that is without buckling and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof performance.
2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection. Where lapped expansion provisions cannot be used or would not be sufficiently waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

3.04 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal composite material wall panel units within installed tolerance of 1/4 inch in 20 feet, non-accumulative, on level, plumb, and location lines as indicated, and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

SECTION 07410 – METAL COMPOSITE MATERIAL WALL PANELS

3.05 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing agency to perform field tests and inspections.

B. Water-Spray Test: After installation, test area of assembly as directed by Architect for water penetration according to AAMA 501.2.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect completed metal composite material wall panel installation, including accessories.

D. Metal composite material wall panels will be considered defective if they do not pass tests and inspections.

E. Additional tests and inspections, at Contractor's expense, are performed to determine compliance of replaced or additional work with specified requirements.

F. Prepare test and inspection reports.

3.06 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal composite material panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal composite material panel installation, clean finished surfaces as recommended by metal composite material panel manufacturer. Maintain panels in a clean condition during construction.

B. After metal composite material panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal composite material panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

(**END OF SECTION 07410)**

SECTION 07411 – METAL ROOF PANELS (Base Bid)

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General Conditions, Supplementary Conditions and Special Conditions (if any), along with the General Requirements, apply to the work specified in this Section.

1.02 Scope: This Section includes all work and supplementary items required to complete the proper installation of manufactured metal roof panel assemblies 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.

A. This section includes the following:
   1. Metal roof panels (Double Lock / Snap Lock).
   2. Gutters and downspouts.
   3. Flashing and Sheet metal flashing contiguously with roof panels.
   4. Soffit panels.

1.03 Related Sections: The following Sections are related to work in this Section:

A. Section 06100 – ROUGH CARPENTRY
B. Section07621 – FLASHING AND SHEET METAL, for flashing not part of roofing and other sheet metal work.
C. Section 07920 – CAULKING AND SEALANTS for field-applied sealants.

1.04 Codes and Standards:

A. The work described in this Section, unless otherwise noted on the drawings, or herein specified, shall be governed by the latest edition of the following codes and specifications.
   1. AAMA (American Architectural Manufacturers Association)
   2. ASTM (American Society for Testing and Materials)
   3. FBC (Florida Building Code)
   4. FM (Factory Mutual Research Corporation)
   5. UL (Underwriters' Laboratories, Inc.)
   6. SMACNA (Sheet Metal & Air Conditioning National Association)

1.05 Submittals:

A. General Requirements: Submit in exact accordance with Section 01300, Submittals, all required Shop Drawings, Calculations, Test Reports, Product Data, and Samples as specified below.

B. Bidding Submittal: All bidders are required to submit the following for evaluation. Any product which has not been submitted, or which has not submitted all the required and listed information below, will not be approved.
   1. Certifications: Submit complete, exact, and specific design data for each specified item as follows:

SECTION 07411 – METAL ROOF PANELS (Base Bid)

a. Weather-tightness: Submit manufacturer's certification that, when tested in accord with the principles of AAMA 501.1, the roof system without sealant in the ribs shall show no leakage when exposed to dynamic rain and wind velocity up to 70 mph for five minutes.
b. Structural Performance: Uniform load capacity shall be determined by testing in accord with the principles of ASTM E-1592. Calculations showing compliance with project loads shall be stamped by a professional engineer registered in the State of Florida. Calculations shall be based on data obtained from the ASTM E-1592 testing.
c. Walking Loads: Roof panels shall be able to support walking loads without excessive distortion or telegraphing of the structural supports. For the maximum span used on the project, panels shall withstand a 250-pound concentrated load applied to a four-square inch pad located at the center of the panel without buckling of the rib or noticeable permanent distortion of the panel.
d. Panels and Flashings: Attachments shall be designed to accommodate the thermal expansion and contraction of exterior metal through a 180ºF temperature change.
e. Wind Loads:
   (1) Roof System must meet all wind load requirements without the use of through bolts or other external devices on the surface of the panel.
   (2) Wind loads shall be designed per the Structural Drawings and the latest version of the Florida Building Code. Wind criteria, unless otherwise noted in the Structural Drawings.
   (3) All roofing material shall be Class “A” by a nationally recognized testing laboratory.

C. Construction Submittal:
1. All information required in the Bidding Submittal shall be included in the construction submittal in the form and quantities established in Section 01300, Submittals.
2. Manufacturer's component data shall be clearly and specifically marked to indicate each component's use for all components intended for approval. Data submitted unmarked or unclear as to its exact intended use shall be returned un-reviewed to the submitter.
3. Shop Drawings: Shop drawings, including erection sequences, procedures, fastener requirements, schedules and complete details, shall be submitted to the Architect for approval. Any fabrication of material prior to the approval of drawings shall be at the risk of the Contractor. All shop drawings and calculations shall be manually signed, dated and impression-sealed by a professional engineer registered in the state of Florida.

   a. Fasteners: The Manufacturer shall provide an engineer-recommended fastener and spacing requirements for the connections of the product to the receiving members specific to this project. This plan shall be manually signed, dated and impression-sealed by a Professional Engineer licensed in the state of Florida.
   b. Submit with the Shop Drawings copies of independent laboratory tests, mill certifications, and calculations manually signed, dated and impression-sealed by a Professional Engineer registered in the State of Florida

SECTION 07411 – METAL ROOF PANELS (Base Bid)

certifying structural performance data of the panels, anchor clips, and fasteners to meet the structural testing and performance and material requirements of this Specification. Manufacturer's certification letters will not be accepted in lieu of the specified independent laboratory test, mill certificates, and calculations by a registered Professional Engineer.

5. Submit material samples as follows:
   a. Panels: One-piece full width and minimum of 12" long of each type to be used
   b. Accessories: One each of each anchor clip, rolled-formed part, or press formed, or molded closure. A flat sample 6" x 6" of material for fabrication of any custom formed profile such as hip, ridge, and rake cap.
   c. Fasteners: Two samples of each type to be used identified as to use.
   d. Sealant and seal tape: One sample at least 8 oz. with descriptive data.
6. Owner's Manual: Upon completion of the work described in this section, the Manufacturer shall provide to the owner's representative an owner's manual describing the specified integral roof assembly installed on the project. The manual shall include cross-sectional drawings and details illustrating the construction of the roof deck assembly installed as well as recommendations for maintenance, repair, and re-roofing operations. Comply fully with the requirements in Section 01300, Submittals.

1.06 Quality Assurance:

A. Manufacturer:
   1. Panels shall be fabricated in full lengths without end-laps.
   2. The Manufacturer shall have had at least ten (10) years' experience using structural metal roof panels in architectural applications, and the roof panel itself shall have been in use for at least ten (10) years.
   3. The Manufacturer ***and Certified Installation Contractor*** shall demonstrate past experience with a list of five (5) projects in Florida similar in size and scope completed in the past five (5) years. Projects must consist of at least 50,000 SF of metal roofing. Submit complete description of each project including product utilized, name, and phone numbers of representatives of the Owner, Architect, Installer, and Contractor to the Architect for approval.
   4. Roofing manufacturer is to provide a list of projects where warranty issues have occurred and explain how they were resolved**.**

B. No "approved equal" material or equipment will be considered unless written request has been submitted to the Architect for approval at the latest fourteen (14) days prior to date for receipt of bids.

C. Each manufacturer desiring to be approved shall submit a list of certified installers qualified to bid their products. Manufacturer shall show for each requested installer the following information:
   1. Proof of manufacturer training
   2. A list of five (5) projects successfully completed in Florida in the past ten (10) years of similar size and scope with manufacturer's product. The list shall contain the same information as the manufacturer's list of projects unless otherwise instructed by the Architect of Record.

D. Installer:
   1. Shall be certified by the panel manufacturer, and the actual work shall be supervised by personnel trained by the manufacturer in the proper application of the product.

SECTION 07411 – METAL ROOF PANELS (Base Bid)

2. Installer must execute 100% of metal roofing system installation with installer's own forces.
3. Installer of the roof panel shall provide a payment and performance bond equal to 100% of the subcontract amount.

E. Manufacturer and Installer shall submit the notice of intent to issue roof warranty (form attached to this specification) with request for approval to bid.

F. The General Contractor shall provide a final "statement of compliance" which states that the finished roof membrane complies with the approved contractual documents which is to be included as part of the closeout submission with the manufacturer's final inspection performed by their certified field inspector. The roof manufacturer and installer shall attend an 11½ month post occupancy warranty inspection of the roof with the Contractor, Architect, and Owner's representative.

1.07 Delivery, Storage, and Handling:

A. Deliver, store, handle, and stack panels in strict accord with manufacturer's instructions to avoid damage that would void the warranty.

1.08 Warranty:

A. The warranty period for paint finish, corrosion, weather tightness and structural integrity shall be for twenty (20) years.

B. The Manufacturer's Warranty shall include ***defects*** in materials and workmanship by the Manufacturer's certified, approved installer.

2.0 PRODUCTS

2.01 Materials:

A. Material Characteristics:

1.	Aluminum Sheet:	ASTM B209, Alloy 3004-H274
2.	Surface:	Smooth
3.	Thickness:	0.040 min. (gauge as required to meet loads)
4.	Rib Spacing:	16" max. (width as required to meet loads)
5.	Finish:	Kynar 500
6.	Galvalume:	Galvalume will be an acceptable substitution to aluminum providing all other criteria within the specification are met or exceeded; confirmation and support documentation is to be included with submission.

2.02 Roof Panel Assemblies:

A. Standing-Seam Roof Panels:

1. 1-1/2" high x 16" max wide standing seam roof panel assembly designed for concealed mechanical attachment of panels to the proposed peel & stick ice & water shield over ½" DensDeck substrate over metal roof deck (rigid insulation) is a deductive alternate. Refer to Section 01100 of this project manual..
2. The ribs shall have a continuous groove capillary break and the pan shall have 2 intermediate stiffener ribs 3/8" high.

B. Clips:

1. Anchor clips shall be same as clip used in all testing efforts, non-magnetic stainless to minimize wear from thermal movement. Base piece may be galvanized.

SECTION 07411 – METAL ROOF PANELS (Base Bid)

2. Clips shall be designed to design loads and allow for thermal movement throughout the temperature range called for in this specification.

C. Fasteners:
1. Fasteners shall be designed for loading conditions specified.
2. Fasteners shall be either cadmium-plated stainless steel or aluminum.
3. Exposed fasteners should be kept to a minimum and shall match the color of the panel.
4. For weather tightness, screws shall have separate washers with hot-bonded neoprene faces, and pop rivets shall be set in wet sealant.
5. Exposed fasteners shall be a minimum #14 sized screw or 3/16" diameter rivet.

D. Foam Closures:
1. Precut foam profile closures shall be black, closed cell foam meeting specification ASTM D-1056 grade SCE-41 Black EPT.
2. Field-fabricated hip closures shall be foam PVC, supported and protected from weathering by a metal channel matching the finish of the metal roof.

E. Sealant:
1. Sealant used with the roofing shall be applied between surfaces during assembly with a minimum amount exposed on the completed installation.
2. Concealed sealant may be a non-curing, non-skinning butyl, polyisobutylene or polybutene tape of sufficient thickness to make full contact with both surfaces.
3. Exposed sealant shall be a curing type with excellent weather and sunlight resistance. The Architect shall select color. Apply in accordance with sealant manufacturer's recommendations.

F. Flashing and Trim:
1. Flashing and trim shall be the same material, finish, and color as the metal roof panels; however, temper may be reduced to facilitate forming.
2. All flashing shown as curved on the drawings shall be fabricated curved, not segmented.
3. *NO LEAD SHALL BE USED ON THIS PROJECT.*

G. Plumbing Vents and Misc. Roof Penetrations: Penetration flashing boots (Dek-Tite or approved equal) shall be furnished and installed by the roofing subcontractor and located by the plumber or other subcontractor requesting the penetration.

H. Storm Collars: *All* neoprene and other UV-degradable flashing are to have metal storm collars attached to the penetrating objects, including lightning protection aerials. Collars are to cover the flashing and are to be painted to match the roofing color, preferably with a baked-on finish similar to the roofing.

I. Soffit Panels: Soffit panels shall be sunken batten type with coverage of 12" to 16", a 3/4" batten depth, and three (3) battens per panel.

J. Downspouts: Gutters shall be fabricated from minimum 0.040 aluminum and downspouts shall be fabricated from minimum 0.032 aluminum. Finish shall be manufacturer's standard two-coat fluoropolymer (Kynar); color to be selected by Architect.

2.03 Underlayment Materials:

A. Underlayment material to be 40 mil minimum peel and stick / ice and water shield.

2.04 Miscellaneous Materials:

A. Gutters shall be fabricated from materials and gauges shown on the design documents, and if not shown the material is to be same gauge and finish as the metal roof panels unless otherwise noted during Shop Drawing review.

SECTION 07411 – METAL ROOF PANELS (Base Bid)

2.05 Fabrication:

A. General: Fabricate and finish panels and accessories at the factory to the greatest extent possible. Fulfill indicated performance requirements demonstrated by laboratory testing

B. Minimum inside bend radius on flashing shall be 3T and all edges shall have open hem for stiffness.

C. Insofar as possible, attachment screws shall be eliminated in favor of concealed cleats or clips

3.0 PRODUCTS / SYSTEMS

3.01 Approved Tested Assemblies and Certified Installers

A. Pac-Clad - Peterson Aluminum – 1-800-272-4482 / 407-399-3402

B. Berridge Manufacturing Inc. – 1-800-756-9358

C. Englert, Inc. – 1-800-683-0905 / 813-248-2296

D. Hickman Metal Roofing, Inc. – 1-800-683-0221

D. Or approved equal: refer to Section 01100 – Alternates and Substitutions

3.02 Panel System (Architect to select from the following panel profiles)

A. Cee-lock

B. Batten System

C. Tee Panel

D. Zee-lock

E. Snap-on Panel / Snap-clad

F. Or Approved Equal

4.0 EXECUTION

4.01 Examination:

A. Prior to the start of metal roof installation the manufacturer's technical representative shall visit the site and report on acceptability of the substrate for applying the metal roof.

B. During the roofing installation the manufacture's technical representative shall visit the site a minimum of two (2) times as directed by the Architect and file a report as to the status of the installation

C. Final visit of the manufacturer's technical representative shall be at the substantial completion of the metal roofing.

D. Reports: After each visit the manufacturer's technical representative shall render a report on the status of the installation, and file copies with the Architect, the General Contractor, the Owner, and the Installer.

4.02 Preparation:

A. Coordinate metal panel roofing with rain drainage work, flashing, trim, and construction of decks, parapet walls, windows, and other adjoining work to provide a leak proof, secure noncorrosive installation.

B. Promptly remove protective film, if any, from exposed surfaces of metal panels.

4.03 Panel Installation:

SECTION 07411 – METAL ROOF PANELS (Base Bid)

A. General: Comply with panel manufacturer's written recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the work in place, with provisions for thermal and structural movement.

B. Storage and Handling: Protection shall be provided during shipment, storage, and erection. During shipment, finished surfaces shall be protected from abrasion by a removable plastic film between areas of contact. Job site storage shall be in a clean dry area out of direct contact with the ground, under cover or sloped for drainage, protected from abuse by traffic and from contamination by corrosive or staining materials.

C. Stored materials and unfinished work shall be protected against wind damage. Installed panels shall be protected from abuse by other trades.

D. Before installation, this contractor shall verify that the structure is ready to receive his work. He shall check field dimensions and alignment of structural members to assure that the roof panels and flashings will be straight and true. The Architect shall be notified on unresolved conditions, which may adversely affect the performance, or appearance of the installed roof, and the work on that location will not proceed until approved by the Architect

E. All work shall be installed in accord with the approved shop details under direct supervision of an experienced sheet metal craftsman. Attachments and joints shall allow for expansion and contraction from temperature changes without distortion or elongation of fastener holes. Flashing shall be installed in strict accord with the recommended practice in the AA, NRCA, and SMACNA architectural sheet metal manuals: without fasteners in end laps and isolated from dissimilar materials.

4.04 Cleaning and Protecting:

A. Completed work shall be plumb and true, free of scrapes and dents. Panel ribs shall be on the module indicated in the contract drawings within the tolerance allowed by actual construction dimension. Excess sealant shall be removed and touch up paint applied to any areas where paint scrapes occurred. Any panels, which are badly damaged and in the judgment of the Architect cannot be repaired shall be removed and replaced.

B. Cleaning: Upon completion of the panel installation, clean finish surfaces as recommended by the panel manufacturer.

(END OF SECTION 07411 (Additive Alternate)

SECTION 07500 – SINGLE PLY ROOFING MEMBRANE (Deductive Alternate)

1.0 GENERAL

1.01 Summary: It is the intent of this section to provide for the furnishing, installing, and warranting of the roofing and all associated work and accessories described herein or necessary for a complete, installation for the roof assembly for the new fire station building, the installation is to include all required miscellaneous incidentals necessary for the complete installation of work detailed, described, or implied within these bid documents. Roof system is to comply with ICC-500 missile impact assembly. Roof Assembly is based on a single ply PVC KEE fleece back membrane system equal to Siplast Parasolo over a DensGlass recovery board on a deductive alternate 5" thick (Min R-25) over a 1 1/2" deep 22ga. Type "B" metal deck on lt. ga. Pre-engineered truss member system.

1.02 Work Included:

A. Work included is a convenient listing of the significant items described within this section and shall not be construed as the only work applicable or related to this section.

B. Work includes, but is not limited to:

1) Flashing
2) Roofing membrane
3) Expansion joints
4) Temporary roofing
5) Roof vents
6) Roof drains
7) Pitch pans
8) Roof hatch & related raised curb

1.03 Related Work Specified Elsewhere:

A. Section 07621 - Flashing and Sheet Metal
B. Section 07920 - Sealants and Caulking

1.04 Quality Assurance:

A. Manufacturer Qualifications:

1. Actively engaged in the manufacture of roofing products for not less than five (5) years.
2. Roofing manufactured in accordance with requirements and standards of the Factory Mutual, National Roofing Contractors Association (NRCA) and Underwriter's Laboratories, Inc.

B. Applicator Qualifications:

1. Actively engaged in the application of and thoroughly familiar and experienced with roofing membrane Manufacturer's products and certified by roofing Manufacturer for application and installation.
2. Provide a field supervisor who shall be completely familiar with, and experienced in, the application of specified roof membranes, and who shall be responsible for application and installation and who shall direct all field operations at all times.
3. Such field supervisor shall be readily available and completely accessible by the owner's Field Representative and Architect.

SECTION 07500 – SINGLE PLY ROOFING MEMBRANE (Deductive Alternate)

C. Source Quality Control - All roofing materials, to include, but not limited to, roofing membrane and accessories shall be manufactured and produced by and under the control of a single Manufacturer.

D. Other Products - All other roofing materials and related products necessary for a complete, secure installation shall be acceptable by the roofing membrane Manufacturer as being compatible and suitable for roof warranty.

1.05 References: All work as specified in this section shall be governed by, and in accordance with, the following codes and standards:

A. 8th Edition Florida Building Code
B. Factory Mutual Approval Guide for Class I-90
C. American Society for Testing of Materials (ASTM)
D. National Roofing Contractors Association (NRCA), Roofing and Waterproofing Manual
E. OSHA – Occupational Safety and Health Administration

1.06 Submittals:

A. Submit the following shop drawings, product data and certificates in accordance with Section 1300 - Submittals
   1. Roofing Manufacturer's product data
   2. Certification of U.L. "Class A" fire rating
   3. Certification of Factory Manual I-90 uplift requirements
   4. Shop Drawings - Flashing details
   5. Roofing warranty - Five (5) year Contractor's workmanship warranty; fifteen (15) year NDL manufacturer's warranty.
   6. Manufacturer's Specifications Data Sheets

B. Submit, if applicable, all pertinent data for product substitutions proposed and a letter stating cause and effect of such substitutions for Owner's and Architect's consideration and approval.

C. Samples - Submit samples of each ply proposed for use on roof for Owner's and Architect's approval.

D. Submit, if applicable, all proposed changes in materials and methods of construction, construction sequences and construction techniques for Owner's and Architect's consideration and approval.

1.07 Tests:

A. Testing Laboratory Service - Acceptable to Owner and currently certified and qualified by the following:
   1. "Recommended Requirements for Independent Laboratory Qualification," latest edition, by the American Council of Independent Laboratories
   2. Testing equipment calibrated at maximum 12-month intervals.

B. Testing Costs shall be borne by Contractor except as specifically stated in Section 00810, Article 1.06

C. Test Reports:
   1. Submit of testing laboratory letterhead and test tabulations sheets, to include, but not limited to:
      a. Statement by testing laboratory as to whether test results meet specification requirements.
      b. Date of field tests and locations.

SECTION 07500 – SINGLE PLY ROOFING MEMBRANE (Deductive Alternate)

2. Submit test results to Architect within seven (7) days following field tests.
3. Submit test results in triplicate.

D. Field Tests:
1. Field tests shall be arranged for and scheduled by Contractor.
2. Owner and Architect shall be notified not less than 24 hours in advance of scheduled tests so that they may be present during testing operations.
3. Test locations will be field determined or approved by Owner or Architect.
4. Testing conducted without the presence of the Owner or Architect, unless approved prior to the time of testing, may be disregarded by Owner and Architect as invalid and subject to retesting at Contractor's cost.

E. Tests to be Performed:
1. Water Test:
a. Test roofing membrane integrity at completion of application of the base sheet and interply and prior to application of cap membrane.
b. Test for water runoff and proper drainage to include, but not limited to:
1) Roof projections
2) Roof slope
c. Architectural and/or Owner's Representative to be present for testing.

1.08 Field Samples:
A. Field samples are defined as physical examples illustrating finishes and finish materials as well as methods and techniques of construction.
B. Field samples may be required and requested by Owner or Architect at such times that materials being applied are suspected to be inadequate to meet Specifications as to materials and products or methods and techniques of application/installation.
1. Tests that may be required to determine the characteristics and properties of a material or product shall be at Contractor's cost if tested materials or products fail.
2. Costs of tests for those materials or products passing successfully will be borne by Owner.

1.09 Product Handling:
A. Delivery - Deliver roofing materials and accessories in Manufacturer's original, unopened, standard containers and packaging with labels and seals intact, and stored on the ground. Minimal quantities of roofing materials and accessories are to be stockpiled and/or stored on the roof deck.
B. Protection - Store all materials in a safe, dry area. Protect from damage due to moisture, before, during and after installation.
C. Replacements - Be responsible for and make all repairs and replacements of damaged or defective materials or work at no additional cost to Owner.

1.10 Job Conditions (Weather Conditions):
A. Proceed with work only when weather conditions permit installation of materials without harm or damage.
B. Provide temporary protection for all materials stored, or installed, and all openings in the event of rain or other unsuitable weather conditions.
C. Be responsible for repairing and replacing materials, stored, or installed, damaged by rain or other unsuitable weather conditions.

SECTION 07500 – SINGLE PLY ROOFING MEMBRANE (Deductive Alternate)

1.11 Warranty: Provide a fifteen (15) year written warranty (NDL single source) from the roof membrane Manufacturer to include, but not limited to, roof membrane and accessories:

A. Roof membrane deterioration due to ordinary wear and tear and effect thereof.
B. Flashing membrane deterioration due to wear and tear and effects thereof.
C. Improper workmanship and installation by roofing contractor of roof membrane or flashing membrane.
D. Blisters, buckles, wrinkles, or ridges in roof membrane
E. Splits in roofing or flashing membrane
F. Temperature fluctuations or thermal shock
G. Roofing and flashing membrane slippage
H. Vent stacks, new or retrofit, drains and scuppers, if required, a pitch pans and roof projections.

2.0 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A. Basis for Design – Siplast Parosolo PVC KEE Fleece back membrane system set in adhesive or approved equal PVC product.
B. Products specified are Performance Specifications and shall be used herein as a standard and basis for all specified roofing and related products.
C. Interested material vendors to refer to Section 01100 of this project manual to obtain prior approval consideration. Provide all support documentation to allow a complete evaluation of products.
D. Similar products may be furnished in lieu of those listed providing that all products listed shall meet Specifications and subject to approval and acceptance by the Owner and Architect. Approved manufacturers as listed below:
   - Siplast Parosolo PVC KEE Fleece-Back membrane system is Basis of Design
   - 60 mil Fiber Tite – SM Fleece-Back roof system by Seaman Corp.
   - 60 mil Tremply KEE Fleece-Back roof system by Tremco Roofing
   - Fiber Tite KEE single ply Fleece-Back membrane system
   - Or approved equal.

2.02 DESCRIPTION OF WORK:

The basic work descriptions required in this specification are referenced below.

Project Type:	New Construction
Deck:	Metal; Slope: 1” per foot slope
Insulation (bottom layer):	Paratherm rigid insulation providing for an R-value (average R-28) as allowed by code with above metal deck thermal insulation or as called out on the drawings, mechanically fastened. Note: Rigid insulation is a deductive alternate.
Roof System:	60 mil Parasolo KEE Fleece back Roof Membrane, applied in Parafast T adhesive.
Flashing System:	60 mil Parasolo KEE detailing membrane applied in bonding adhesive.
Supplemental Flashing System:	Parapro 123 Flashing System

SECTION 07500 – SINGLE PLY ROOFING MEMBRANE (Deductive Alternate)

2.03 SUBMITTALS:

All submittals that do not conform to the following requirements will be rejected.

A. Submittal of Equals: Submit primary roof systems to be considered as equals to the specified roof system no less than 10 days prior to bid date. Primary roof systems which have been reviewed and accepted as equals to the specified roof system will be listed in an addendum prior to bid date; only then will equals be accepted at bidding. Submittals shall include the following:

1. Two 3-inch x 5-inch samples of the primary roofing and flashing sheets.

2. Latest edition of the roofing system manufacturer's specifications and installation instructions.

3. Evidence that the manufacturer of the proposed roofing system utilizes a quality management system that is ISO 9001 certified. Documentation of ISO 9001 certification of foreign subsidiaries without domestic certification will not be accepted.

4. Evidence and description of manufacturer's quality control/quality assurance program for the primary roofing products supplied. The quality assurance program description shall include all methods of testing for physical and mechanical property values. Provide confirmation of manufacturer's certificate of analysis (COA) for reporting the tested values of the actual material being supplied for the project prior to issuance of the specified guarantee.

5. Descriptive list of the materials proposed for use.

6. Evidence of Underwriters' Laboratories Class A acceptance of the proposed roofing system (including mopping asphalt or cold adhesive) without additional requirements for gravel or coatings. No other testing agency approvals will be accepted.

7. Evidence that the roof configuration (including fastening of insulation) has been tested by an accredited independent testing agency to meet the design wind load pressure indicated in Part 1.07 C2.

8. The roof membrane configuration shall be approved by FM for Class 1-SH (severe hail) exposure.

9. Complete list of material physical and mechanical properties for each sheet including weights and thicknesses.

10. Sample copy of the proposed guarantee.

B. Submittals Prior to Contract Award:

1. Letter from the proposed primary roofing manufacturer confirming that the bidder is an acceptable Contractor authorized to install the proposed system.

2. Letter from the primary roofing manufacturer stating that the proposed application will comply with the manufacturer's requirements in order to qualify the project for the specified guarantee.

C. Submittals Prior to Project Close-out:

SECTION 07500 – SINGLE PLY ROOFING MEMBRANE (Deductive Alternate)

1. Manufacturer's printed recommendations for proper maintenance of the specified roof system including inspection frequencies, penetration addition policies, temporary repairs, and leak call procedures.

2.04 QUALITY ASSURANCE

A. Acceptable Products: Primary roofing products, including each type of sheet, all manufactured in the United States, shall be supplied by a single manufacturer which has been successfully producing the specified types of primary products for not less than 10 years. The primary roofing products shall have maintained a consistent composition for a minimum of five years.

B. Product Quality Assurance Program: Primary roofing materials shall be manufactured under a quality management system that is monitored regularly by a third-party auditor under the ISO 9001 audit process. A certificate of analysis (COA) for reporting/confirming the tested values of the actual material being supplied for the project will be required prior to project close-out.

C. Agency Approvals: The proposed roof system shall conform to the following requirements. No other testing agency approvals will be accepted.

1. Evidence by an accredited independent testing agency or agencies that the roof configuration meets a design wind load pressure of – 67.5 psf or greater. Roof assembly to comply with ICC-500 code and testing.

D. Acceptable Contractor: Contractor shall have a minimum of two (2) years of experience in successfully installing the same or similar roofing materials and be certified in writing by the roofing materials manufacturer to install the primary roofing products.

E. Scope of Work: The work to be performed under this specification shall include but is not limited to the following: Attend necessary job meetings and furnish competent and full-time supervision, experienced roof mechanics, all materials, tools, and equipment necessary to complete, in an acceptable manner, the roof installation in accordance with this specification. Comply with the latest written application instructions of the manufacturer of the primary roofing products. In addition, application practice shall comply with requirements and recommendations contained in the latest edition of the National Roofing Contractors Association (NRCA) Roofing Manual as published by the National Roofing Contractors Association.

F. Local Regulations: Conform to regulations of public agencies, including any specific requirements of the city and/or state of jurisdiction.

G. Manufacturer Requirements: Ensure that the primary roofing materials manufacturer provides direct trained company personnel to attend necessary job meetings, perform periodic inspections as necessary, and conducts a final inspection upon successful completion of the project.

2.05 PRODUCT DELIVERY STORAGE AND HANDLING:

A. Delivery: Deliver materials in the manufacturer's original sealed and labeled containers and in quantities required to allow continuity of application.

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B. Storage: Refer to the manufacturer's published literature for storage guidelines.

C. Handling: Handle all materials in such a manner as to preclude damage and contamination with moisture or foreign matter. Handle rolled goods to prevent damage to edges or ends.

D. Damaged Material: Any materials that are found to be damaged or stored in any manner other than stated above will be automatically rejected, removed and replaced at the Contractor's expense.

2.06 PROJECT/SITE CONDITIONS

A. Requirements Prior to Job Start

1. Notification: Give a minimum of five (5) days' notice to the Owner and manufacturer prior to commencing any work and notify both parties on a daily basis of any change in work schedule.

2. Permits: Obtain all permits required by local agencies and pay all fees which may be required for the performance of the work.

3. Safety: Familiarize every member of the application crew with all fire and safety regulations recommended by OSHA, NRCA and other industry or local governmental groups.

B. Environmental Requirements

1. Precipitation: Do not apply roofing materials during precipitation or in the event there is a probability of precipitation during application. Take adequate precautions to ensure that materials, applied roofing, and building interiors are protected from possible moisture damage or contamination.

2. Temperature Restrictions - adhesive: Refer to the manufacturer's published guidelines for temperature restrictions for adhesive applications.

C. Protection Requirements

1. Membrane Protection: Provide protection against staining and mechanical damage for newly applied roofing and adjacent surfaces throughout this project.

2. Limited Access: Prevent access by the public to materials, tools and equipment during the course of the project.

3. Debris Removal: Remove all debris daily from the project site and take it to a legal dumping area authorized to receive such materials.

4. Site Condition: Complete, to the owner's satisfaction, all job site clean-up including building interior, exterior and landscaping, where affected by the construction.

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2.07 GUARANTEE / WARRANTY

A. Roof Membrane Guarantee: Upon successful completion of the project, and after all post installation procedures have been completed, furnish the Owner with the manufacturer's 20-year labor and materials membrane guarantee. The guarantee shall be a term type, without deductibles or limitations on coverage amount, and shall be issued at no additional cost to the Owner.

- Siplast 20-year Parasolo Roof Membrane Guarantee

PART 3 PRODUCTS

3.01 ROOFING SYSTEM ASSEMBLY/PRODUCTS

A. Rigid Roof Insulation: Roof insulation shall be UL and FM approved. Insulation shall be approved in writing by the insulation manufacturer for intended use and for use with the specified roof assembly. Maintain a maximum panel size of 4 feet by 8 feet where deductive alternate polyisocyanurate insulation is specified to be installed in insulation adhesive.

1. Polyisocyanurate (Deductive Alternate): A closed cell, rigid polyisocyanurate foam core material, integrally laminated between glass fiber reinforced organic facers, in full compliance with ASTM C 1289, Type II, Class 1, Grade 2 (20 psi). Panels shall have a nominal thickness TBD on drawings. Acceptable types are as follows:

- Paratherm by Siplast; Irving, TX

3.02 DESCRIPTION OF SYSTEMS

A. Roof Membrane Ply (fleece-back): A roof membrane consisting of one ply of a prefabricated, polyester scrim-reinforced, polyvinyl chloride (PVC) membrane formulated with an Elvaloy® Ketone Ethylene Ester (KEE) copolymer, applied over a prepared substrate. The roof membrane shall have a factory-adhered polyester fleece backing on the bottom side. The roof membrane shall meet or exceed the minimum criteria established by ASTM D4434 Standard Specification for Poly(Vinyl Chloride) Sheet Roofing (Type III). The minimum thickness of the roof membrane shall be 60 mils (1.52 mm), as established by ASTM D751 Standard Test Method for Coated Fabrics. The minimum thickness of the roof membrane over the reinforcement scrim shall be 27 mils (0.685 mm), as established by ASTM D7635 Standard Test Method for Measurement of Thickness of Coatings Over Fabric Reinforcement.

- Siplast Parasolo PVC KEE Fleeceback roof system – 60 mil

B. Flashing Ply (fleece-back): A roof membrane consisting of one ply of a prefabricated, polyester scrim-reinforced, polyvinyl chloride (PVC) membrane formulated with an Elvaloy® Ketone Ethylene Ester (KEE) copolymer, applied over a prepared substrate. The flashing membrane

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shall have a factory-adhered polyester fleece backing on the bottom side. The flashing system shall meet or exceed the minimum criteria established by ASTM D4434 Standard Specification for Poly (Vinyl Chloride) Sheet Roofing (Type III). The minimum thickness of the flashing membrane shall be 60 mils (1.52 mm) as established by ASTM D751 Standard Test Method for Coated Fabrics. The minimum thickness of the flashing membrane over the reinforcement scrim shall be 27 mils (0.685 mm) as established by ASTM D7635 Standard Test Method for Measurement of Thickness of Coatings Over Fabric Reinforcement.

- Siplast Parasolo PVC KEE smooth detailing membrane – 60 mil

C. Catalyzed Acrylic Resin Flashing System: A specialty flashing system consisting of a liquid-applied, fully reinforced, multi-component acrylic membrane installed over a prepared or primed substrate. The flashing system consists of a catalyzed acrylic resin primer, basecoat, and topcoat, combined with a non-woven polyester fleece. The resin and catalyst are pre-mixed immediately prior to installation. The use of the specialty flashing system shall be specifically approved in advance by the membrane manufacturer for each application.

- Parapro 123 Flashing System by Siplast; Irving, TX

* *NOTE: Unistrut supports are not a suitable substrate for the Parapro 123 Flashing System. Any unistrut type penetration that is required to be incorporated into the roofing system should be replaced b*y a solid square or angle iron penetration with a fully welded plate.

D. Substitute Systems: The following substitute systems shall be considered in lieu of the specified basis of design.

- 60 mil FiberTite-SM roof system by Seaman Corp., Wooster, OH
- 60 mil TremPly KEE roof system by Tremco Roofing and Building Maintenance, Beachwood, OH

3.03 ROOFING ACCESSORIES

A. Roofing Membrane Adhesives

1. Fleeceback PVC Membrane Adhesive: A two-part low-rise polyurethane foam adhesive designed for bonding fleece-backed PVC single-ply roofing membranes to various roofing substrates.

- Parafast T Adhesive by Siplast; Irving, TX

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B. Sealant: A solvent-based, UV resistant synthetic elastomeric sealant for the completion of details.

- Parasolo Flexseal Caulk Grade by Siplast; Irving, TX

C. Water Block: A single component butyl-based high viscosity sealant for sealing the flashing membrane to the substrate behind exposed termination bars, flashing boots, drain flanges.

- Parasolo Water Block by Siplast; Irving, TX

D. Membrane Conditioner/Cleaner: A solvent-based agent used to clean exposed or contaminated seams prior to heat welding to remove any residue that may compromise lap welding.

- Parasolo Membrane Conditioner by Siplast; Irving, TX

E. Membrane Flashing Accessories

1. Cover Patches at T-Joints: A molded PVC membrane used to reinforce the T-joints of the specified PVC membrane system.

- Parasolo KEE T-Joint Cover Patch by Siplast; Irving, TX

2. Pre-formed Boots: A molded PVC membrane used to flash pipe and conduit penetrations having a diameter of 1 to 6 inches (25 to 152 mm). The pre-formed boots shall be hot air welded directly to the PVC roof membrane.

- Parafast KEE Conical Pipe Boot by Siplast; Irving, TX

3. Outside Corner Flashing: A molded PVC membrane designed to accommodate outside corners of base and curb flashing details. The molded flashing component shall be hot air welded directly to the specified PVC membrane.

- Parasolo KEE Outside Corner by Siplast; Irving, TX

4. Inside Corner Flashing: A molded PVC membrane designed to accommodate inside corners of base and curb flashing details. The molded flashing component shall be hot air welded directly to the specified PVC membrane.

- Parasolo KEE Inside Corner by Siplast; Irving, TX

5. Fluted Corner Flashing: A molded PVC membrane designed to accommodate corners of base and curb flashing details having dimensions that cannot be addressed using standard pre-formed PVC inside or outside corner flashing components. The molded flashing component shall be hot-air welded directly to the specified PVC membrane.

- Parasolo KEE Fluted Corner by Siplast; Irving, TX

6. Flashing Strip: An 8-inch-wide molded PVC membrane strip designed for general repairs, end laps, and to strip-in PVC coated metal flanges.

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- Parasolo KEE Flashing Strip by Siplast; Irving, TX

7. Termination Bar with Receiver: An extruded aluminum termination bar with rounded edges and an angled sealant receiver and lower leg bulb stiffener, having factory-punched, slotted holes spaced on 6-inch (152 mm) centers.

   - Parafast Lip Termination Bar 6 inch On Center by Siplast; Irving, TX

8. Termination Bar with Receiver: An extruded aluminum termination bar with rounded edges and an angled sealant receiver and lower leg bulb stiffener, having factory-punched, slotted holes spaced on 8-inch (203 mm) centers.

   - Parafast Lip Termination Bar 8 inch On Center by Siplast; Irving, TX

9. Flat Termination Bar: A flat, extruded aluminum termination bar with rounded edges, having factory-punched, slotted holes spaced on 6-inch (152 mm) centers.

   - Parafast Flat Termination Bar 6 inch On Center by Siplast; Irving, TX

10. Flat Termination Bar: A flat, extruded aluminum termination bar with rounded edges, having factory-punched, slotted holes spaced on 8-inch (203 mm) centers.

    - Parafast Flat Termination Bar 8 inch On Center by Siplast; Irving, TX

11. PVC Coated Metal: 4-foot by 10-foot sheets of [24-gauge galvanized steel] [stainless steel] [0.040 aluminum] having a factory-laminated PVC coating, used for fabrication into metal gravel stop/drip edge components, base flashings, sealant pans, and scupper sleeves.

    - Parafast PVC Coated Metal by Siplast; Irving, TX

F. Fasteners

1. Insulation Fasteners: Insulation fasteners and plates shall be FM Approved, and/or approved by the manufacturer of the primary roofing products. The insulation fasteners shall provide attachment required to meet the specified uplift performance and to restrain the insulation panels against the potential for ridging. The fastening pattern for each insulation panel to be used shall be as recommended by the insulation manufacturer and approved by the manufacturer of the primary roofing products. Acceptable insulation fastener manufacturers for specific deck types are listed below.

   A) Metal Decks: Insulation mechanical fasteners for metal decks shall be factory coated for corrosion resistance. The fastener shall conform meet or exceed Factory Mutual Standard 4470 and when subjected to 30 Kesternich cycles, show less than 15% red rust. Acceptable insulation fastener types for metal will be acceptable.

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PART 4 EXECUTION

4.01 PREPARATION

A. General: Sweep or vacuum all surfaces, removing all loose aggregate and foreign substances prior to commencement of roofing.

B. Remove All Existing:

- Surface gravel
- Roof membrane
- Insulation
- Base flashings
- Edge metal
- Flanged metal flashings
- Cants, wood blocking
- Walkways
- Nonfunctional penetrations/curbs
- Drain assemblies
- Vapor retarder
- Metal trim, counterflashing

4.02 SUBSTRATE PREPARATION

A. Insulation: Install insulation panels with end joints offset; edges of the panels shall be in moderate contact without forcing applied in strict accordance with the insulation manufacturer's requirements and the following instructions.

1. Insulation - single layer: Mechanically attach the insulation panels, using the specified fasteners, at a rate of 1 fastener for every 1.78 square feet of panel area. Increase the fastening frequency by 50% at the perimeter of the roof and mechanically attach the corners at the rate of 1 fastener per 1 square foot (32 fasteners per 4-foot by 8-foot panel).

4.03 ROOF MEMBRANE INSTALLATION

A. Membrane Application: Apply roofing in accordance with roofing system manufacturer's instructions and the following requirements. Application of roofing membrane components shall immediately follow application of base sheet and/or insulation as a continuous operation.

B. Aesthetic Considerations: Construction of an aesthetically pleasing overall appearance of the finished roof application is a standard requirement for this project. Make necessary preparations, utilize recommended application techniques, apply the specified materials, and exercise care in ensuring that the finished application is acceptable to the Owner.

C. Membrane Adhesive Application: Membrane adhesive can be applied by roller. Apply cold adhesive in a smooth, even, continuous layer without breaks or voids. Utilize an application rate as published by the roof membrane manufacturer.

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D. Roofing Application: Apply roofing to be free of wrinkles, creases, or fish mouths. Use a blower and/or broom to remove any dirt or debris from the substrate surface.

1. Unroll the specified fleece-back PVC sheets in place and fold back sheets in the long dimension to allow adhering of membrane, one half of sheet at a time. Alternatively, align a full roll of membrane with the factory-applied lap line on the previously installed sheet. Roll out the roll approximately 20 feet (6.1 m) checking to see that the edge of the new roll is straight with the line. Pick up the tail end of the previously rolled-out membrane and pull back over top of the roll of membrane.

2. Apply the specified low-rise foam adhesive in a “spatter pattern” over the substrate to yield a heavily textured, even coating of approximately 1/4- inch (6.2 mm) to 1/2 inch (12 mm) nominal thickness height on the peaks of the spattered adhesive. Allow the adhesive to rise and apply the roof membrane before the adhesive begins to “skin” over.

3. Lay half of the membrane into the wet adhesive and roll into place with a 150 lb. (68 kg) roller. Repeat the process for the other half of sheet. If following the alternative method, pull the sheet back to its original position, and roll into place. Make sure that the lap line is followed when re-installing the sheet.

4. Where the substrate angle changes in excess of 5 degrees (i.e., 1-inch slope), mechanically attach the membrane into the structural deck on [6-inch, 12-inch] centers, keeping the fasteners 1/4 to 3/4 inches from the angle change. At curbs and walls where the angle changes in excess of 10 degrees (i.e., 2-inch slope), mechanically attach the membrane into the structural deck on [6-inch, 12-inch] centers, keeping the fasteners 1/2 inch from the membrane edge. Alternatively, at walls/curbs extend the membrane a minimum of 3 inches up the vertical flashing substrate and mechanically attach the specified lipped termination bar, inverted, at the top edge of the membrane. The termination bar must be installed within 1.5 to 2 inches (38 to 51 mm) of the horizontal plane of the roof, with a minimum of 1-inch (25 mm) of membrane extending above the termination bar. Prior to mechanical attachment of the termination bar, apply the specified water block sealant on the flashing substrate where the membrane will terminate. Apply the specified sealant at the top of the termination bar if left exposed.

5. Install a minimum of 4 fasteners evenly spaced around all round, square, “L”-beam or “H”-beam penetrations, keeping the fasteners 1/4 to 3/4 inches from the penetration. At penetrations having a larger diameter, install fasteners around the penetration on 12-inch centers.

6. Clean the laps of membrane that have become dirty or contaminated using the specified conditioner. Heat weld all side and end laps of the membrane during each day’s application. All welds must be continuous, without voids, and free of burns and scorch marks. Weld shall be a minimum width of 1.5 inches (38 mm) for automatic machine welding and 2 inches (51 mm) for hand welding. Contact the manufacturer of the heat-welding equipment for specific guidelines on operating the equipment. Hand-roll the side laps and head laps of the membrane behind the heat welder.

SECTION 07500 – SINGLE PLY ROOFING MEMBRANE (Deductive Alternate)

E. Flashing Application - General: Locate all penetrations at least 24 inches from curbs, walls, and edges to provide access for proper application of the specified flashing materials. Reinforce all coated metal and membrane flashing corners using preformed corners or non-reinforced membrane. Hot-air weld all flashing membranes, accessories, and coated metal to have a minimum 2-inch (51 mm) hand-welded or minimum 1.5-inch (38 mm) automatic machine-welded lap. Reference the manufacturer's standard details for all flashing conditions.

F. Flashing Application - Coated Metal Flashings: Form coated metal flashings in accordance with the manufacturer's published specifications. Reference the manufacturer's standard details for all flashing conditions. Gap joints of coated metal edge, and flashing sections by a 1/4-inch (6 mm) to allow for expansion and contraction. Apply 2-inch (51 mm) aluminum tape over the joint as a bond-breaker, to prevent welding in this area. Hot-air weld a 6-inch (152 mm) unsupported membrane flashing strip to both sides of the joint, with approximately 1-inch (25 mm) on either side of the joint left un-welded to allow for expansion and contraction. Lap all joints of coated metal sealant pans, scupper inserts, corners of roof edging and base flashing, or pop-rivet a separate metal piece to create a continuous flange condition. Hot-air weld a 6-inch (152 mm) strip of reinforced membrane flashing over all seams that will not be sealed during subsequent flashing installation.

G. Reinforced Fleece back Flashing Application - Adhered Membrane Flashing: Apply the specified low-rise foam adhesive to the substrate at the minimum rate published by the roof membrane manufacturer. Allow the adhesive to rise before application of the flashing membrane.

H. Reinforced Flashing Application - Dry-hung Membrane Flashing (horizontal lap orientation): Prior to installation, heat-weld the laps of the reinforced flashing sheet. Starting with the lowest lap of the flashing sheet, install the flashing membrane with the side laps running horizontally. mechanically attach the flashing membrane through the unadhered selvage into the flashing substrate using the specified fasteners on 12-inch centers. Mechanically attach subsequent side laps up the full height of the flashing condition using the same method. Terminate the top of the flashing membrane in accordance with the manufacturer's standard details.

* *NOTE: For dry hung flashing with a horizontal lap orientation, install the flashing sheet in maximum sheet heights of 24 inches.*

I. Reinforced Flashing Application – Dry-hung Membrane Flashing (vertical lap orientation): Install the flashing membrane with the side laps running vertically. When using 10-foot-wide sheets, maintain a maximum distance of 10-feet from the ends and corners of walls for the first course of flashing membrane, and a maximum distance of 20-feet from vertical laps across the remaining breadth of the wall. Mechanically attach each course of the flashing membrane through the selvage into the flashing substrate using the specified fasteners on 12-inch centers. Heat weld the laps over the fasteners and terminate the top of the flashing membrane in accordance with the manufacturer's standard details.

* *NOTE: For vertical lap orientation, walls having a height greater than 9-feet must have the flashing membrane adhered in lieu of dry hung.*

SECTION 07500 – SINGLE PLY ROOFING MEMBRANE (Deductive Alternate)

J. Reinforced Smooth Flashing Application - Adhered Membrane Flashing (solvent based adhesive): Apply the solvent-based bonding adhesive to both the underside of the membrane and the substrate at the minimum rate published by the manufacturer. Allow the bonding adhesive to dry until tacky to the touch before application of the flashing membrane.

* *NOTE: For adhered flashing with a horizontal lap orientation, apply the flashing sheet in maximum sheet widths of 54 inches.*

K. Catalyzed Acrylic Resin Flashing System: Install the liquid-applied primer and flashing system in accordance with the membrane system manufacturer's printed installer's guidelines and other applicable written recommendations as provided by the manufacturer.

L. Water Cut-Off: At end of day's work, or when precipitation is imminent, construct a water cut-off at all open edges. Cut-offs can be built using asphalt or plastic cement and roofing felts, constructed to withstand protracted periods of service. Cut-offs must be completely removed prior to the resumption of roofing.

4.05 ROOF SYSTEM INTERFACE WITH RELATED COMPONENTS

A. Termination Bars: Prior to mechanical attachment of the termination bar, apply the specified water block sealant on the flashing substrate where the membrane will terminate. Mechanically attach termination bars using the specified fasteners. Apply a continuous bead of the specified sealant at the top of termination bars that are fabricated with a sealant receiver lip.

4.06 FIELD QUALITY CONTROL AND INSPECTIONS

A. Site Condition: Leave all areas around job site free of debris, roofing materials, equipment, and related items after completion of job.

B. Notification of Completion: Notify the manufacturer by means of manufacturer's printed Notification of Completion form of job completion in order to schedule a final inspection date.

C. Final Inspection

1. Post-Installation Meeting: Hold a meeting at the completion of the project, attended by all parties that were present at the pre-job conference. A punch list of items required for completion shall be compiled by the Contractor and the manufacturer's representative. Complete, sign, and mail the punch list form to the manufacturer's headquarters.

D. Issuance of the Guarantee: Complete all post installation procedures and meet the manufacturer's final endorsement for issuance of the specified guarantee.

(END OF SECTION 07500)

SECTION 07621 – FLASHING AND SHEET METAL

1.0 GENERAL

1.01 Summary: It is the intent of this section to provide for the furnishing, fabricating, and installing of manufactured flashing products as described herein and necessary for a complete, secure installation acceptable for roof warranty.

1.02 Work Included:

A. Work included is a convenient listing of the significant items described within this section and shall not be construed as the only work applicable or related to this section.

B. Work includes, but is not limited to:

1. Expansion joints
2. Exposed flashing units
3. All components, fasteners, parts and other items necessary for a complete, secure installation and acceptable for roof warranty.

1.03 Related Work Specified Elsewhere: Section 07920 - Sealants and Caulking

1.04 References:

A. ASTM A526-86 “Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hop-Dip Process, Commercial Quality.”

B. ASTM A527-85 “Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by Hot-Dip Process, Lock-Forming Quality.”

C. ASTM B32-87 “Standard Specification for Solder Metal.”

D. ASTM B209-86 “Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.”

E. ASTM D2822-75 (1982) “Standard Specification for Asphalt Roof Cement.”

F. NRCA “Roofing and Waterproofing Manual,” Fourth Edition, 1987.

G. SMACNA “Architectural Sheet Metal Manual,” Fourth Edition, 1987.

1.05 Submittals:

A. Shop Fabricated Products

1. Submit large-scale details of all roofing sheet metal work.
   a. Drawing scale - minimum 1 - 2" = 1'0"
   b. Show anchorage of each component
   c. Show metal type and gauges for each component
   d Show configurations and profiles of each component
2. Samples
   a. Submit minimum 16" square samples of each component composed of specified metal and gauge with specified or selected finish, style, and color.
   b. Submit sample kit of standard color array for specified finishes for selection by Owner and Architect.
3. Submit three (3) copies of Manufacturer’s Specification Data Sheet.

B. Manufactured Products

1. Submit Manufacturer’s literature and product data along with installation instructions for all patented and manufactured products. Show details of construction and recommended anchorage.
2. Samples

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a. Submit minimum 16" square samples of each component composed of specified metal and gauge with specified or selected finish, style, and color.
b. Submit sample kit of standard color array for specified finishes for selection by Owner and Architect.

3. Submit three (3) copies of Manufacturer's Specification Data Sheet.

1.06 Product Handling:

A. Delivery of Manufactured Products - Deliver all sheet metal components in Manufacturer's original, unopened, standard containers, and packaging with all labels and seals intact.

B. Delivery of Shop Fabricated Products - Deliver all sheet metal components in longest length suitable and practicable for intended use and installation. Wrap and bundle in protective covering or packaging.

C. Protection - Store and protect all sheet metal products from damage or abuse prior to installation.

D. Repairs and Replacement - Be responsible for and make all repairs and replacements of damaged, abused, or defective products at no additional cost to Owner.

1. Whether a product is to be repaired or replaced will be the Architect's decision.
2. Obtain Architect's approval prior to making repairs or replacements.

1.07 Job Conditions (Weather Conditions):

A. Proceed with work only when weather conditions will permit installation of materials without harm or damage.

B. Provide temporary protection of all materials, stored, or installed and all openings in event of rain or other unsuitable weather conditions.

C. Be responsible for repairing and replacing materials, stored, or installed damaged by rain or other unsuitable weather conditions.

1.08 Warranty:

A. Provide a 20-year Manufacturer's or fabricator's written umbrella warranty to include, but not limited not to, material deterioration, leakage, or blow-off. Carry FM I-90 written approval.

B. Provide a 20-year Manufacturer's written warranty to include, but not limited to color retention and stability and finish deterioration.

C. Carry a 20-year written warranty (NDL single source) from roofing membrane manufacturer as outlined in Section07411. Warranty is to recognize the mph uplift design criteria identified on the structural drawings. Wind speed as recorded at the Naval Air Station located in Jacksonville, Florida.

2.0 PRODUCTS

2.01 Sheet Metal Materials: Aluminum and aluminum-alloy sheet and plate: ASTM B209, alloy and temper pursuant to fabricator's published instructions.

2.02 Acceptable Manufacturers:

A. Manufactured expansion joint units; any marketed product of listed Manufacturers in accordance with the following:

SECTION 07621 – FLASHING AND SHEET METAL

1. Flexible units designed for installation on wood curbs/cants and fabricated in sections or roll lengths with flat and formed metal flanges.
   a. Flange metal - 0.032 in. Formed aluminum
   b. Finish - none; mill finish, as fabricated
2. Applications. Conditions - shown on Drawings, roof-to-roof, and roof-to-wall.

B. Manufactured exposed flashing units; any marketed product of listed Manufacturers in accordance with following:

C. Manufactured fascia, roof edge trim, system; any marketed product of listed Manufacturers pursuant to the following:
1. Type - Provide complete systems as standard systems
2. Metal - 0-050 in. Formed aluminum
3. Finish - Manufacturer's standard fluoropolymer finish with 70% Kynar resin.
4. Accessories - Furnish fascia system complete with accessories required for watertight installation; include ledge/wall caps, and mitered corners.

2.04 Shop and/or Field Fabricated Items:

A. Fabricate pursuant to SMACNA "Architectural Sheet Metal Manual."

B. Expansion joint units - Provide formed metal expansion joint units designed for installation on 14 gage formed metal curb pursuant to SMACNA "Architectural Sheet Metal Manual," Plates 85 through 90 as applicable.
1. Metal - 22 gauge galvanized steel
2. Finish - none; mill finish, as fabricated.
3. Applications/conditions - roof-to-roof and roof-to-wall

C. Exposed flashing units; including drop edges, and surface reglets.
1. Metal - 0.040 in. formed aluminum
2. Finish - Fluoropolymer finish with 70% Kynar resin

D. Fascia (roof edge time) system:
1. Metal - 0.050 in. formed aluminum
2. Finish - Fluoropolymer, finish with 70% Kynar resin
3. Dam height - match existing
4. Face height - match existing (6")
5. Accessories - Furnish gravel stop/fascia system complete with accessories required for watertight installation, to include conductor heads, ledge/wall caps, and mitered corners.

2.05 Color:

A. To be selected by Architect from full color array for finishes specified.

B. Factory Applied Coating - Color to be selected by Architect from both standard and custom color options.

3.0 EXECUTION

3.01 Inspection:

A. Surface conditions - Verify that substrate surface is suitable for installation.

B. Do not start work until all conditions are satisfactory and suitable.

C. Beginning of installation shall signify acceptable of substrate and other conditions as suitable for installation.

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3.02 Installation: Install gravel stop watertight, with lines and angles sharp and true, without wavers, warps, buckles, fastening stresses or distortion, allowing for expansion and contraction.

A. Provide and install spice joints concealed in accordance with Manufacturer's instructions.

B. Install prefabricated corners.

3.03 Adjusting and Cleaning:

A. Remove bent, crimped, scratched, or otherwise damaged or marred gravel stop pieces. Check for tightness and cover to prevent leaks.

B. Remove cuttings and debris from site. Leave work clean and free from stains.

(END OF SECTION 07621)

SECTION 07920 - SEALANTS AND CAULKING

1.0 GENERAL

1.01 Summary: It is the intent of this section to provide for the furnishing and installing of sealants and caulking as described herein or as is necessary to provide a complete, water-tight building or a complete, finished appearance.

1.02 Related Work Specified Elsewhere:
- A. Section 01710 – Cleaning
- B. Section 07621 – Flashing and Sheet Metal

1.03 Submittals:
- A. Samples:
  1. Submit one cartridge of each type and color sealant to be used.
  2. Submit three (3) pieces of backing material, minimum 6" long, of each size required
- B. Product Data:
  1. Submit three (3) copies of product Manufacturer's specifications, recommendations, and installation instructions for sealant, backing, and associated materials.
  2. Submit two (2) copies of Manufacturer's color chart for sealant selection.
- C. Provide minimum three (3) copies of Manufacturer's Specification Data Sheets for each product specified.

1.04 Product Handling:
- A. Deliver materials in original, tightly sealed containers or unopened packages with Manufacturer's name, label, product identification, and lot numbers, where appropriate, intact.
- B. Store materials out of weather as recommended by Manufacturer.
- C. Protect materials from damage before, during, and after installation.

1.05 Job Conditions:
- A. Environmental Requirements:
  1. Apply only when temperatures shall be a minimum of 50 degrees F and when rain is not forecast for 24 hours.
  2. Observe Manufacturer's recommendations for safe handling and ventilation.
- B. Protection:
  1. Adjacent Surfaces - Protect work of other trades from damage by sealant with masking tape or other means necessary.
  2. Damaged Work - Clean, repair or replace damaged work, to include, but not limited to, work of other trades, at no additional cost.

1.06 Warranty:
- A. Provide Manufacturer's written warranty of twenty (20) year period (NDL) against material failure.
- B. Provide Manufacturer's written warranty of twenty-five (25) year period for fungus resistant shingles (NDL) against material failure.
- C. Provide a warranty for workmanship against leakage for two (2) year period.

SECTION 07920 - SEALANTS AND CAULKING

2.0 PRODUCTS

2.01 Sealants:
- A. Vertical Exterior Joints - Vulkem No. 227 as manufactured by Mameco Corp. (Optional - Vulkem No. 116)
- B. Horizontal Exterior Joints - Vulkem No. 245 (Optional - Vulkem No. 116)

2.02 Backer Rod:
- A. Material - Open cell compressible, resilient, non-waxing, polyurethane foam, compatible with sealant.
- B. Size and Shape - Variable to control depth of sealant and provide 20% to 50% compression upon insertion.

2.03 Primer: Non-staining type approved by sealant Manufacturer.

2.04 Bond Breaker: Pressure sensitive adhesive polyethylene tape approved by sealant Manufacturer.

2.05 Masking Tape: Pressure sensitive adhesive paper tape.

2.06 Joint Cleaner: Xylol.

3.0 EXECUTION

3.01 Inspection:
- A. Examine surfaces to be caulked to assure that they are sound, smooth, clean, dry and free of visible contamination, suitable and ready for sealant application.
- B. Assure that surfaces requiring curing have been properly cured and ready for sealant application.
- C. Do not start work until surface conditions to be caulked are satisfactory, and defects have been corrected.

3.02 Preparation:
- A. Cleaning - Clean joint surfaces, using joint cleaner as necessary, to be free of dust, dirt, oil, grease, rust, lacquers, moisture or other contaminants and matter which may adversely affect proper adhesion of sealant.
- B. Masking - Mask area adjacent to joints.
- C. Primer - After cleaning joints, apply primer, if recommended by sealant Manufacturer, to dry surfaces.
- D. Joint Backer - Where joint depth exceeds required depth of sealant, install joint backing to provide backing and uniform depth of sealant.
- E. Bond Breaker - Where joint backing is not required or cannot be installed, install bond breaker tape smoothly at back of joint.

3.03 Installation/Application:
- A. Sealant Application:
  1. Apply sealant in accordance with Manufacturer’s application instructions.
  2. Use handguns or air-pressure equipment, with proper nozzle size, with sufficient pressure to drive and force sealant into and completely fill joints.

SECTION 07920 - SEALANTS AND CAULKING

B. Tooling:
   1. Tool joints to form smooth, uniform beads with slightly concave surfaces.
   2. Finish joints to be straight, uniform, smooth, and neatly finished.
   3. All caulking and sealants are to be installed by a trained field mechanic, and are to be neat and clean with straight, consistent edges.

3.04 Cleaning:
   A. Clean off excess compound or smears with cleaning agent recommended by sealant Manufacturer.
   B. Take care not to damage adjacent work with cleaning agent, to include, but not limited to, defacing or marring finished surfaces.
   C. Follow the cleaning procedures as specified in Section 01710.
   D. Protect finished sealant work as required to prevent damage until acceptance of work.

3.05 Schedule:
   A. Where different materials meet, adjoin, or abut.
   B. Where sealant is required to prevent moisture intrusion into building.
   C. At aluminum transition bars at vertical surfaces.

(END OF SECTION 07920)

SECTION 08100 - HOLLOW METAL DOORS AND FRAMES

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 Description of Work: This Section covers the work necessary to furnish and install, complete, the following:
- A. Non-rated and fire rated rolled steel doors and frames.
- B. Interior window frames.
- C. Door louvers

1.03 Related work specified elsewhere:
- A. *Section 04100 - Masonry, Mortar, and Accessories*
- B. *Section 08200 - Wood Composition and Wood Doors*
- C. *Section 08400 – Aluminum Storefront System*
- d. *Section 08800 - Glass and Glazing*
- D. *Section 09900 - Painting*

1.04 References:
- A. UL 10B-93, Fire Tests of Door Assemblies
- B. ASTM-A366-95A - Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
- C. ASTM -A568-95 - Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled
- D. ASTM-A 569-91A - Specification for Steel, Carbon, (0.15 Maximum Percent), Hot-Rolled Sheet and Strip Commercial Quality.
- E. ASTM-A924-95 - General Requirements for Steel Sheet, Metallic Coated by the Hot-Dip Process
- F. ASTM-A620 - Specifications for Steel, Sheet, Carbon, Drawing Quality, Special Killed, Cold Rolled (for embossed panels)
- G. ANSI/SDI-100-91 - Recommended specifications for standard steel doors and frames.
- H. SDI-105-91 - Recommended Erection Instructions for Steel Frames
- I. SDI-107-78 - Hardware on Steel Doors (reinforcement-application)
- J. NFPA-80-1995 - Standard for Fire Doors and Windows
- K. NFPA-101-1994 - Life Safety Code
- L. ANSI-A250.4-1994 Test Procedure and acceptance criteria for physical endurance
- M. ANSI-A224.1-1980 - Test Procedure and acceptance criteria for prime painted steel surfaces for steel doors and frames
- N. ADA, the Americans with Disabilities Act - Title III - Public Accommodations
- O. ANSI-A117.1-1986 - American National Standards Institute - Accessible and Usable Buildings and Facilities
- P. U. L. - Underwriter's Laboratories
- Q. WHO - Warnock Hersey International. Division of Inchcape Testing Services
- R. State and Local codes including Authority Having Jurisdiction

1.05 Submittals:
- A. Shop Drawings: Indicate door and frame elevations and sections, materials, gages and finishes, fabrication and erection details, locations of finish hardware by

SECTION 08100 - HOLLOW METAL DOORS AND FRAMES

dimension and locations/details of all openings and louvers - submit six (6) copies each to Contractor-Architect for approval. Do not proceed with any fabrication until all details are approved.

B. Certification of Compliance: Submit any information necessary to indicate compliance to any or all of these Specifications as requested.

C. Submit any samples necessary as required by Architect.

1.06 Quality Assurance:

A. Provide labels on all fire rated doors and frames where required (see Door Schedule).

B. Certification of label construction - For components exceeding Underwriters Laboratories, Inc. (UL) - furnish inspection certificate stating that component construction conforms to UL rating requirements only if Architect is aware of such a limitation and has allowed the non-labeled unit.

C. Hollow metal supplier shall be a qualified direct distributor of products to be furnished. In addition, the distributor shall have in their regular employment an A.H.C./C.D.C. or person of equivalent experience who shall be made available at reasonable times to consult with the Architect/Contract and/or Owner regarding any matters affecting the door and frame openings.

1.07 Delivery, Storage, and Handling:

A. Deliver doors and frames cardboard wrapped, crated, palatted, or otherwise protected during transit and site storage.

B. Contractor to inspect doors and frames upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptance to the Architect; otherwise remove and replace damaged items as directed.

C. Store doors and frames at the building site in a dry secure place.

1. Place units on minimum 4" high wood blocking.
2. Avoid use of non-vented plastic or canvas shelters which could create a humidity chamber.
3. If cardboard wrapper on door becomes wet, remove carton immediately.
4. Provide 3 inch spaces between stacked doors to promote air circulation.

1.08 Sequencing and Scheduling: Deliver all doors and frames to the job site in a timely manner so as not to delay progress of other trades. Contractor to let purchase orders to frame, door, and hardware suppliers early so as not to interfere with normal quoted delivery of materials.

1.09 Warranty: All hollow metal doors and frames shall be supplied with a one (1) year warranty against defects in materials and workmanship, commencing with the date of Substantial Completion.

2.0 PRODUCTS

2.01 Acceptable Manufacturers (providing the products supplied comply with this specification):

A. Ceco Corp., Oakbrook, Illinois

B. Curries Co., Mason City, Iowa

C. Steelcraft Manufacturing Co., Cincinnati, Ohio

SECTION 08100 - HOLLOW METAL DOORS AND FRAMES

2.02 Materials:

A. Steel requirements, all doors and frames to be manufactured of commercial quality, stretcher leveled flatness, cold rolled steel per ASTM A-366 and A-568 general requirements or galvanized to A-60 minimum coating weight standard. Internal reinforcing may be manufactured of hot rolled pickled and oiled steel per ASTM A-569.

B. Coating materials: Primer - Use Manufacturer's standard rust inhibiting primer conforming to A.N.S.I. A-224.1 - 1980.

C. Core materials

1. Non-labeled doors or labeled doors, polystyrene foam core - self extinguishing, non-toxic in case of fire.
2. Fire labeled doors with temperature rise rating shall have a mineral fiber core sufficient to obtain s 250EF temperature rating.

D. Glass lights shall be fabricated of not less than 18 ga. galvanized steel with attachment screws allowed only on the non-secure side, not visible when viewing door light frame face.

2.03 Fabrication:

A. General

1. Fabricate all doors and frames in accordance with SDI - 100-1991 except where more stringent requirements are specified.
2. Prepare doors to receive finish hardware per approved schedule. Include all through-bolting holes as required per hardware template. Do not include unnecessary cut outs in doors not required by hardware template.
3. Supply only doors and frames manufactured by one (1) of the acceptable Manufacturers listed in this specification. All products supplied shall be from one Manufacturer only.

B. Doors:

1. Classification: SDI - Interior Grade II Mode 2 - seamless design/Exterior - SDI Grade III Model 2 seamless design
2. Face sheets: Minimum of 18 ga. cold-rolled steel for interior and 16 ga. at exterior
3. Vertical lock edges; square edge *(ADD. #2)* - seamless construction by welding and filling at the factory only.
4. Top and bottom channels are to be not less than 16 ga. - flush or inverted; welded to the face sheets. Close tops of out swinging exterior doors flush by the addition of steel top channel fillers if necessary.
5. Astragals: Where called for shall be flat security type or 'Z' as called for in the Drawings or Specifications.
6. All doors must conform to A.N.S.I. - A-151.1 Level 'A' criteria and be tested to 1,000,000 operating cycles. Certification of Level 'A' doors is to be submitted with approval Drawings by the distributor. Do not bid or supply any type or gauge of door not having been tested or passed this criterion.

C. Frames:

1. Construction: 16 ga. cold rolled steel at interior locations, 16 ga. galvanized at exterior installation.
2. All frames are to be face welded and ground smooth, and re-primed unless otherwise noted. Provide temporary shipping bars to help protect from damage during transit and handling. Temporary spreaders are to be

SECTION 08100 - HOLLOW METAL DOORS AND FRAMES

removed before setting frames. All welds on frames, transoms, and/or side lites are to be flush with neatly mitered or butted material cuts.

3. Frames for masonry walls shall be standard frames. Frames for drywall shall have 2" returns, note the use of 4" deep frames at door heads where indicated.

D. Frame Anchors:

1. Wall anchors for frame attachment to masonry construction: All anchors built into exterior or masonry walls are to be galvanized. Masonry anchors, adjustable, flat, corrugated or perforated 'T' shaped anchors with leg not less than 2" wide by 10" long or masonry "wire" type not less than 3/16" diameter.
2. Wall anchors for attachment to drywall partitions: Manufacturers adjustable type compression anchors where knocked down frames (K.D.) are indicated. Use steel or wood stud anchors sized to accommodate frame jamb depth and face dimension on all welded frames.
3. All frame jamb anchors are to be provide; one each jamb per 2' - 6" of frame height or fraction thereof.
4. Floor anchors; Angle clip type - 16 ga. minimum, to receive 2 fasteners per jamb, welded to the bottom of each jamb.
5. Head struts; for frames not anchored to masonry or concrete construction provide ceiling struts spot welded to jambs each side extending to building structure where called for on schedule.
6. In place masonry or concrete - 3/8" countersink flathead stove built and expansion shields. Weld pipe spacers or other type spacers per manufacturer standard design in back of frame soffit to protect frame profile during tightening of bolt and anchors.

E. Preparation for Hardware:

1. Reinforcement: Reinforce components for hardware installation in accord with SDI-107. All lock and closer reinforcements shall be "box" type. All hinge reinforcing on doors is to be channel type, continuous from top to bottom of door welded to face sheets.
2. Punch single leaf frames to receive three (3) silencers; double leaf frames to receive one silencer per leaf at head.
3. Factory prepared hardware locations shall be in accord with "Recommended locations for builders' hardware for standard steel doors and frames", as adopted by The Steel Door Institute.
4. Supply welded in mortar guards at all hardware cutouts in frames built into masonry or to be grouted in full.
5. The use of "S.N.B." does not relieve the use of proper lock, closer and exit device reinforcements.

2.04 Accessories:

A. Manufacturer's standard anchors, fasteners, etc.

B. Louvers: Roll formed steel material, slat blade, minimum 30 percent free area; factory installed; size as noted on Drawings. Provide exterior doors with aluminum 18 by 14 mesh, 0.0123 diameter, 5056 clad insect screen with frame to match louver.

C. Silencers: As specified in *Section 08700 - Finish Hardware*.

D. Glazing Stops: Rolled steel channel shape, prepared for countersink style screws. Glazing stops shall accommodate glass of the type and thickness indicated on the Drawings and as specified in *Section 08800 - Glass and Glass*.

SECTION 08100 - HOLLOW METAL DOORS AND FRAMES

E. Provide door Manufacturer's overlapping astragals for ACTIVE LEAF on all exterior double doors, unless specified otherwise in *Section 08710 - Finish Hardware*.

3.0 EXECUTION

3.01 Setting Frames:

A. Set all frames in accord with SDI 105-'87.

B. Set welded frames in position prior to beginning partition work. Brace frames until permanent anchors are set.

C. Set anchors for frames as work progresses. Install anchors at hinge and strike levels.

D. Use temporary setting spreaders at all locations and use of intermediate spreaders to assure of proper door clearances and header braces for grouted frames is required.

E. Install frames in prepared openings in concrete and masonry walls using countersunk bolts and expansion shields.

F. Install all fire rated frames in accord with requirements of NFPA-80-1990.

3.02 Door Installation:

A. Install hollow metal doors in frames using hardware specified in Section 08710 Finish Hardware.

B. Clearances at edge of doors:

1. Between door and frame at head and jambs: 1/8"
2. At meeting edges pairs of doors and at mullions: 1/8"
3. At transom panels, without transom bars: 1/8"
4. At sills without thresholds: 3/4" maximum above finish floor
5. At sills with thresholds: 1/8" above threshold

3.03 Adjustment and Cleaning:

A. Remove dirt and excess sealants, mortar, or glazing compounds from exposed surfaces.

B. Adjust moving parts for smooth operation. Use shims if necessary to allow for proper closing.

C. Fill all dents, holes, etc. with metal filler and sand smooth and flush with adjacent surfaces - Paint to match finish.

(END OF SECTION 08100)

SECTION 08710 - DOOR HARDWARE

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 references specification sections relating to commercial door hardware for the following:

1. Swinging doors.
2. Sliding Doors.
3. Other doors to the extent indicated.

B. Commercial door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical and access control door hardware.
3. Electromechanical and access control door hardware power supplies, back-ups and surge protection.
4. Automatic operators.
5. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Hollow Metal Doors and Frames”.
2. Division 08 Sections “Flush and Clad Wood Doors”.
3. Division 08 Section “Door Hardware”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: Reference Related Sections for requirements regarding compliance with applicable industry standards.

SECTION 08710 - DOOR HARDWARE

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

a. Type, style, function, size, label, hand, and finish of each door hardware item.
b. Manufacturer of each item.
c. Fastenings and other pertinent information.
d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
e. Explanation of abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for door hardware.
g. Door and frame sizes and materials.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

D. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service

SECTION 08710 - DOOR HARDWARE

representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

F. Warranties and Maintenance: Special warranties and maintenance agreements specified in the Related Sections.

1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum [5] years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum [3] years documented experience installing both standard and electrified builders' hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum [5] years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor in good standing by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

D. Source Limitations: Obtain each type and variety of Door Hardware specified in the Related Sections from a single source, qualified supplier unless otherwise indicated.

E. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the applicable model building code.

F. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

SECTION 08710 - DOOR HARDWARE

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

A. Templates: Obtain and distribute to the parties' involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Division 08 Sections (Steel, Aluminum and Wood) doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

1.8 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Refer to "PART 3 – EXECUTION" for required specification sections.

PART 3 - EXECUTION

3.1 DOOR HARDWARE SETS

A. The door hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in

SECTION 08710 - DOOR HARDWARE

a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

B. The supplier is responsible for handing and sizing all products as listed in the door hardware sets. Quantities listed are for each pair of doors, or for each single door.

C. Products listed in the Door Hardware Sets must meet the requirements described in the specification sections noted.

1. Section 08 71 00 – Door Hardware.

D. Manufacturer's Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. RO - Rockwood
4. SA - Sargent
5. RF - Rixson
6. 00 - Other

Hardware Schedule

HARDWARE GROUP NO. 01
Provide SGL door(s) with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	630	IVE
1	EA	STOREROOM LOCK	ND80HD RHO	626	SCH
1	EA	SFIC EVEREST CORE	80-037	626	SCH
1	EA	LOCK GUARD	LG127	626	IVE
1	EA	SURFACE CLOSER	4040XP SCUSH TBSRT	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	188SBK PSA	BK	ZER
1	EA	THRESHOLD	65A-223	A	ZER

(END OF SECTION 08710)

SECTION 08800 - GLASS AND GLAZING

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 Codes and Standards:
- A. FS - Federal Specifications
- B. ASTM - American Society for Testing and Materials

1.03 Related Work: Section 08200-Wood Composition and Wood Doors

1.04 Product, Storage, and Handling: Deliver just prior to installation, bearing Manufacturer's label identifying quality, type and thickness of glass. Stored glass to be cartoned or crated and protected from damage.

1.05 Acceptable Manufacturers: PPG (PPG Industries, Inc.), LOF (Libbey-Owens-Ford Company), CE Glass

2.0 PRODUCTS

2.01 Glass: Provide and install the following types of interior and exterior glass, as scheduled on Drawings. All glass and glazing to be by one Manufacturer (except wire glass). Glazing installer to provide tempered glass at all areas as required to be in compliance with codes.
- A. 3/4" Dual Glazed Tinted/Clear Tempered (1/4 each) (Exterior)

2.02 Glazing Materials:
- A. Glazing materials to comply with combined recommendation glass Manufacturer, and Manufacturer of sealants.
- B. One Component Silicone Rubber Sealant (1 SRS) - Silicone rubber-based, one-part elastomeric sealant, complying with FS TT-S001543, Class A non-acid type.
- C. Butyl Rubber Sealant Type (BRST) - Partially-vulcanized, self-adhesive, non-staining, elastomeric butyl rubber type, recommended by Manufacturer for waterproof construction when compressed 35% in dynamically-moving joints: not less than 98% solids; no deterioration for 3,000 hour test in Atlas Weatherometer.
- D. Cellular Neoprene Glazing Gaskets (CNGG) - Closed-cell neoprene gaskets with integral skin; extruded or molded to the profiles shown or, if not shown, as required by glazing system with ASTM C-509, Grade 4, black.

3.0 EXECUTION

3.01 Weather Conditions: Do not proceed with installation of liquid sealants under adverse weather conditions or when temperatures are below or above Manufacturer's recommended limitations for installation. Proceed with glazing only when forecasted weather conditions are favorable to proper cure and development of high early bond strength.

3.02 Installation: Comply with combined recommendations of glass Manufacturer and Manufacturer of sealants and other materials used in glazing, except where more stringent

SECTION 08800 - GLASS AND GLAZING

requirements are shown of specified and except where Manufacturers' technical representatives direct otherwise. Cut and install colored (tinted) and heat-absorbing glass as recommended in "Technical Services Report No. 104D" by PPG. Comply with "Glazing Manual" by Flat Glass Marketing Association, except as shown and specified otherwise and except as specifically recommended otherwise by Manufacturers of glass and glazing materials. Unify the appearance of each series of lights by setting each piece to match others as nearly as possible. INSPECT EACH PIECE AND SET WITH PATTERN, DRAW AND BOW ORIENTED IN SAME DIRECTION AS OTHER PIECES.

3.03 Preparation: Clean glazing channel or other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrate. Remove lacquer from metal surfaces whenever elastomeric sealants are used. Apply primer or sealer to joint surfaces wherever recommended by sealant Manufacturer. Do not attempt to cut, seam, nip, or abrade glass which is tempered, heat-strengthened, or coated. Inspect each piece of glass immediately before installation and eliminate any which have observable edge damage or face imperfections.

3.04 Setting: Provide minimum 1/4" sealant depth. Where required, provide setting blocks of proper size at recommended spacing. Sash corners to be made weathertight by fabricators. Avoid point loading and metal to glass contact. Non-corrosive metal clips with rounded edges to contact cushions only. Force sealants into channel to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces. Tool exposed surfaces of glazing liquids and compounds to provide substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel. To eliminate dirt and moisture pockets.

3.05 Cure and Protection: Cure glazing sealants and compounds in compliance with Manufacturer's instructions and recommendations, to obtain high early bond strength and surface durability. Advise contractor of procedures required for protection of glass and glazing sealants and compounds during construction period so they will be without deterioration or damage (other than normal weathering) at time of Owner's acceptance including specific instructions on precautions and provisions required to prevent glass damage resulting from alkaline wash from green concrete surfaces and similar sources of possible damage. Protect exterior glass from breakage immediately upon installation, by attachment of crossed streamers to framing held away from glass. Do not apply markers of any type to surfaces of glass. Remove and replace glass which is broken, chipped, cracked, abraded, or damaged in any other way during construction period, including natural causes, accidents, and vandalism.

3.06 Clean-Up: Clean glazing and trim excess glazing materials from glass and stops or frames promptly after installation; and eliminate stains and discoloration. Clean both interior and exterior of glazing and remove all stickers and excess sealants.

(END OF SECTION 08800)

SECTION 09111 - METAL STUD FRAMING SYSTEM

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including the General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 Description of Work: This Section of the Specifications is intended to cover the furnishing of all labor, material, equipment and/or incidentals necessary to the completion of all requirements of the Drawings, notes, schedules, or implied concerning the installation of metal studs interior partitions and structural stud framing which include but are not limited to: top and bottom runners, studs, internal bracing, partitioning, and blocking and furring.

1.03 Related Work:
- A. Gypsum board field finished and vinyl covered.
- B: Fire rated gypsum

1.04 Codes and Standards:
- A: ASTM C-645 Non-load bearing steel studs, runners and rigid furring channels.
- B. ASTM C-646 Load bearing steel studs.
- C. ASTM C-754 Installation of steel framing members.
- D. GA-203 Installation screw type framing to secure gypsum board system.

1.05 Quality Assurance: Work shall be performed in conformance with ASTM C-754 and GA-203.

2.0 PRODUCTS

2.01 Materials:
- A. 6" and 3-1/2" wide 20 ga. galvanized channel shaped steel studs at 16" O.C., punched for utility access.
- B. Runners, same material and thickness bent leg retainer, notched to receive studs at 16" O.C.
- C. Joists shall be 8" Channel, 16 ga. blocked at 1/3 points over all ceilings.
- D. Structural studs shall be 6", 16-gauge, 16" O.C. with 14 Gauge track.
- E. Furring and blocking members, same material and thickness. Double where required for furring or boxing of piping.
- F. Fasteners GA 203.
- G. Furnish blocking for all plumbing fixtures, wall cabinets, toilet accessories, toilet partitions, and finish hardware. Blocking shall be P.T. wood or steel channels heavy enough to support intended use.

3.0 ERECTION

3.01 General:
- A. Secure top and bottom runners at 16" O.C. and not more than 2" from abutting construction.
- B. Install studs vertical and not more than 2" from abutting construction.
- C. Brace stud framing and make rigid at 1/3 points max.
- D. Coordinate erection of studs with installation of service utilities.
- E. Coordinate installation of windows, bucks, anchors, blocking
- F. Stud splicing is not permissible.
- G. Maintain clearance under structural members to avoid deflection transfer.

3.02 Tolerances: Install members to provide a surface place with a maximum variation of 1/8" in 10 feet in any direction.

(END OF SECTION 09111)

SECTION 09900 – PAINTING

1.0 GENERAL

1.01 Related Documents: The General Provisions of the Contract, including General and Supplementary General Conditions and General Requirements, apply to the work specified in this Section.

1.02 Description of Work: The extent of painting work is shown on the Drawings and schedules and specified herein. The work includes the painting and finishing of interior and exterior exposed items and surfaces throughout the project, except as otherwise indicated. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, stains, sealers, and fillers: and other applied US26D materials, whether used as prime, intermediate or finish coats.

1.03 Painting Not Included: The following categories of work are not included as part of the field-applied finish work or are included in other sections of these Specifications.

1.04 Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under the various sections for structural steel, miscellaneous metal, hollow metal work and similar items; also, for fabricated components such as architectural woodwork, wood casework and shop-fabricated or factory-built mechanical and electrical equipment or accessories.

1.05 Mechanical and Electrical Work: The painting of certain items of mechanical and electrical work is specified or called for on the drawings. All exposed conduit to be painted.

1.06 Prefinished Items: Unless otherwise indicated, do not include painting when factory-finishing or install-finishing is specified for such items (but not limited to) architectural woodwork and casework, prefinished windows, prefinished aluminum, fascia, rain drainage and trim, finished mechanical and electrical equipment, including light fixtures, switchgear, and distribution cabinets.

1.07 Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.

1.08 Finished Metal Surfaces: Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not required finish painting, unless otherwise indicated.

1.09 Operating Parts and Labels: Moving parts of operating units and mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices and motor and fan shafts, will not require finish painting, unless otherwise indicated. Do not paint over any Code-required labels, such as Underwriters' Laboratories, Inc. and Factory Mutual, or any equipment identifications, performance rating, name plates or nomenclature plates.

1.10 Submittals-Product Data: For information only, submit two copies of the Manufacturer's technical information, including the paint label analysis and application instructions, for each material proposed for use. Transmit a copy of each manufacturer's instructions to the paint applicator.

SECTION 09900 – PAINTING

1.11 Submittals-Samples: Submit three color rings of entire color line to be used for selection of project colors. Architect will select a series of color options that will require three (3) copies of larger 8" x 8" samples to be presented to the Owner for selection of the final colors. Compliance with all other requirements is the exclusive responsibility of the contractor. Provide a listing of the material and application for each coat of each finish sample.

1.12 Delivery and Storage: Deliver all materials to the job site in their original, new, and unopened packages and containers bearing the Manufacturer's names and labels and the following information:

A. Name and title of material
B. Manufacturer's stock number and date of manufacture
C. Manufacturer’s name
D. Contents, by volume, for major pigment and vehicle constituents
E. Thinning instructions
F. Application instructions
G. Color name and number

1.13 Comply with health and fire regulations in the handling and storage of paint materials. Do not store painting materials in the building.

1.14 Environmental Requirements: Apply paints only when the temperature of the surfaces to be painted and the surrounding air temperatures are between 50 degrees F and 90 degrees F., unless otherwise permitted by the paint Manufacturer's printed instructions. Do not apply paint in areas where dust is being generated and where the illumination is inadequate. Do not apply paint in snow, rain, fog, or mist; when the relative humidity exceeds 85%; or to damp or wet surfaces, unless otherwise permitted by the paint Manufacturer's printed instructions or unless the area and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint Manufacturer, during the application and drying periods.

1.15 Training: Prior to Owner taking occupancy of the project, manufacturer to schedule a training session with the Owner, principals, teachers, and the maintenance department personnel to discuss the use of adhesives and maintenance of the various painted wall finishes. This training session is to be videotaped and a copy of the tape included in the closeout material for the project.

1.16 Guarantee: Guarantee all paint products and their application for a period of one year after final acceptance. The guarantee shall cover the replacement of defective material evidences by blistering, spalling, flaking, fading, powdering, or any other undesirable characteristics. Failures caused by extraneous sources, such as water leakage or physical abuse, will not be the responsibility of this subcontractor.

2.0 PRODUCTS

2.01 Colors and Finishes: Paint colors, surface treatments, and finishes are indicated in the SCHEDULES of the contract documents. Prior to beginning the work, the architect will furnish color chips for the surfaces to be painted. Use representative colors when preparing samples for review.

2.02 Color Pigments: Use pure, non-fading, applicable types of color pigments, to suit the substrates and the service indicated.

SECTION 09900 – PAINTING

2.03 Lead Content: **ONLY LEAD FREE PAINT SHALL BE USED.**

2.04 Paint Coordination: Provide finish coats which are compatible with the prime coats used. Review other sections of these Specifications in which prime paints are to be provided, to insure the compatibility of the total coatings system for the various substrates. Upon the request from other trades, furnish information on the characteristics of the finish materials proposed for use, to insure that compatible prime coats are used. Provide barrier coats over incompatible primers; or remove and re-prime as required. Notify the architect, in writing, of any anticipated problems in using the specified coating systems with substrates primed by others.

2.05 Material Quality: Provide the best quality grade of the various types of coatings as regularly manufactured by acceptable paint material Manufacturers. Materials not displaying the Manufacturer's identification as a standard, best-grade product will not be acceptable. Provide an undercoat paint produced by the same Manufacturer as the finish coats. Use only thinners approved by the paint Manufacturer; and use only within the recommended limits. Use paint materials which will withstand normal washing to remove pencil marks, ink, ordinary soiling, etc. without showing discoloration, loss of gloss, staining or other damage.

2.06 Proprietary Names: The proprietary names used to designate colors or materials are not intended to imply that the products of the named Manufacturers are required to the exclusion of equivalent products of other Manufacturers.

2.07 Paint Systems: Use products of the paint Manufacturers listed below, unless substitutions are approved in accordance with Division 1 of these Specifications. The approved equals Manufacturers are referred to as follows:

CW ---------- Color Wheel
G ---------- Glidden Paint Company
P ---------- Pittsburgh/ Porter Paint Company
S-W ---------- Sherwin-Williams Paint Company

EXTERIOR SYSTEMS

FERROUS METAL

Gloss Finish (Water Base)

1st Coat: CW AquaTec Industrial Primer 1640 Series
(1.9 mils dry per coat)
2nd Coat: CW AquaTec Industrial Acrylic Enamel 1600 Series
3rd Coat: CW AquaTec Industrial Acrylic Enamel 1600 Series
(1/6 mils dry per coat)

Gloss System (Solvent Base)

1st Coat: CW Ironize Industrial Primer 640 Series
(2 mils dry per coat)
2nd Coat: CW Ironize Alkyd Enamel 600 Series
3rd Coat: CW Ironize Alkyd Enamel 600 Series
(2 mils dry per coat)

SECTION 09900 – PAINTING

STUCCO & CONCRETE

Flat Finish
1st Coat: CW Flex Lox High Build 1240 Series
(3.6 mils dry per coat)
2nd Coat: CW Flex Lox High Build 1240 Series
(3.6 mils dry per coat)

Satin Finish
1st Coat: CW Flex Lox High Build Satin 1270 Series
(3.6 mils dry per coat)
2nd Coat: CW Flex Lox High Build Satin 1270 Series
(3.6 mils dry per coat)

METAL PIPING (ALKYD)
Gloss System
1st Coat: CW Ironize Industrial Primer 640 Series
(2 mils dry per coat)
2nd Coat: CW Ironize Alkyd Enamel 600 Series
3rd Coat: CW Ironize Alkyd Enamel 600 Series
(2 mils dry per coat)

WOOD- PAINTED FINISH

Flat – 100% Acrylic

1st Coat: CW Optima All Prime 330 Series
(1.6 mils dry per coat)
2nd Coat: CW Optima Super Acrylic Flat 100 Series
3rd Coat: CW Optima Super Acrylic Flat 100 Series
(1.7 mils dry per coat)

Satin – 100% Acrylic

1st Coat: CW Optima All Prime 330 Series
(1.6 mils dry per coat)
2nd Coat: CW Optima Super Acrylic Satin 130 Series
3rd Coat: CW Optima Super Acrylic Satin 130 Series
(1.7 mils dry per coat)

Semi-Gloss – 100% Acrylic

1st Coat: CW Optima All Prime 330 Series
(1.6 mils dry per coat)
2nd Coat: CW Optima Super Acrylic Semi-Gloss 350 Series
3rd Coat: CW Optima Super Acrylic Semi-Gloss 350 Series
(1.7 mils dry per coat)

SECTION 09900 – PAINTING

INTERIOR SYSTEMS

DRYWALL /PLASTER:

Flat –

1st Coat: CW UltraTech C152 Interior Latex Primer -Sealer
2nd Coat: CW UltraTech C115 Interior Latex Flat
3rd Coat: CW UltraTech C115 Interior Latex Flat

Eggshell –

1st Coat: CW UltraTech C152 Interior Latex Primer-Sealer
2nd Coat: CW UltraTech C106 Interior Latex Eggshell
3rd Coat: CW UltraTech C106 Interior Latex Eggshell

Semi-Gloss

1st Coat: CW UltraTech C152 Interior Latex Primer-Sealer
2nd Coat: CW UltraTech C119 Interior Latex Semi-Gloss
3rd Coat: CW UltraTech C119 Interior Latex Semi-Gloss

CONCRETE BLOCK (CMU) Dry Areas

Eggshell –

1st Coat: CW UltraTech C302 Interior/Exterior Block Filler
2nd Coat: CW UltraTech C106 Interior Latex Eggshell
3rd Coat: CW UltraTech C106 Interior Latex Eggshell

Semi-Gloss

1st Coat: CW UltraTech C302 Interior/Exterior Block Filler
2nd Coat: CW UltraTech C119 Interior Latex Semi-Gloss
3rd Coat: CW UltraTech C119 Interior Latex Semi-Gloss

CONCRETE bLOCK (CMU) Wet Areas Kitchen and Bathrooms

Semi-Gloss

1st Coat: CW UltraTech C302 Interior/Exterior Block Filler
2nd Coat: CW Clean Coat Aqua Epoxy 1300 Series
3rd Coat: CW Clean Coat Aqua Epoxy 1300 Series

FERROUS METAL

Gloss Finish (Water Base)
1st Coat: CW AquaTec Industrial Primer 1640 Series
(1.9 mils dry per coat)

SECTION 09900 – PAINTING

2nd Coat: CW AquaTec Industrial Acrylic Enamel 1600 Series
3rd Coat: CW AquaTec Industrial Acrylic Enamel 1600 Series
(1.6 Mils dry per coat)

CONCRETE FLOOR PAINT

Epoxy Finishes:

Shower rooms, Kitchens, and areas subject to high humidity and in periods of contact with water. Not to be used in areas subject to immersion.
SEE NOTE!:

1st Coat: Comex Industrial Coating E-10 High Solid Epoxy
Apply 4.0-6.0 mils DFT.
Brush or squeeze the epoxy into the pours and pin holes to form a pinhole smooth finish.

2nd Coat: Comex Industrial Coating E-10 High Solid Epoxy
Apply 4.0-6.0 mils DFT per coat.

(NOTE: Apply a sample of the primer; allow full curing of primer, top coat the surface to be coated. Check for lifting before proceeding, if lifting of the primer occurs contact your Color Wheel representative)

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- A non-skid texture and Deco Flakes to be added to give a skid resistant finish
- Install in strict conformance with manufacturer's recommendations.

3.0 EXECUTION

3.01 Surface Preparation (Wood): Perform preparation and cleaning procedures in strict accord with the paint Manufacturer's instructions and as herein specified, for each particular substrate condition. Remove all hardware, hardware accessories, machines surfaces, plates, lighting fixtures, and similar items in place and not to be finished-painted; or provide surface-applied protection prior to surface preparation and painting operations. Remove, if necessary, for the complete painting of the items adjacent surfaces. Following completion of the painting of each space or area, reinstall the removed items, the work to be done by workmen skilled in the trades involved. Clean the surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to the mechanical cleaning. Program the cleaning and painting so that contaminants from the cleaning process will not fall onto wet, newly painted surfaces. Spotting-in of rubbed-off places in shop coats shall be done by the trade installing the materials, unless otherwise provided, before any field painting is done; and such spotting-in will not be considered as one of the coats specified or called for on the schedules.

3.02 Surface Preparation (Wood): Clean wood surfaces to be painted of all dirt, oil or other foreign substances, with scrapers, mineral spirits, and sandpaper, as required. Sandpaper smooth those finished surfaces exposed to view; and dust off. Scrape and clean small, dry, seasoned knots; and apply a thin coat of white shellac or other recommended knot sealer, before application of the priming coat. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sandpaper smooth when dried.

SECTION 09900 – PAINTING

3.03 Surface Preparation (Ferrous Metals): Clean ferrous surfaces which are not galvanized or shop-coated of oil, grease, dirt, loose mill scales, and other foreign substances, by solvent or mechanical cleaning.

3.04 Surface Preparation (Cementitious Material): Prepare cementitious and gypsum base surfaces of concrete, concrete block and cement plaster and drywall finish to be painted by removing all efflorescence, chalk, dust, dirt, grease and oils and by roughening as required to remove glaze. Determine the alkalinity and moisture content of the surfaces to be painted by performing the appropriate tests. If the surfaces are found to be sufficiently alkaline to cause blistering, and burning of the finish paint, correct this condition before the application of the paint. Do not paint over surfaces where the moisture content exceeds that permitted by Manufacturer's printed directions. If concrete or concrete masonry contain excessive voids, pits, burrs or uneven surfaces to permit filling with the specified prime or filler coat and to provide a satisfactory finish surface after normal painting trade preparation procedures, then the Contractor shall be notified for corrective work before proceeding with the painting.

3.05 Materials Preparation (General): Mix and prepare painting materials in accordance with the Manufacturer's directions. Store the materials that are not in actual use in tightly covered containers. Maintain the containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue. Stir materials before application to produce a mixture of uniform density; and stir as required during the application of the materials. Do not stir surface film into the material. Remove the film and lumps and, if necessary, strain the material before using.

3.06 Apply in accord with the Manufacturer's directions and with the following directives:

3.07 Use applicators and techniques best suited for the substrate and the type of material being applied.

3.08 Apply additional coats when undercoats, stains or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance. Give special attention to insure that all surfaces, including edges, corners, crevices, welds and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

3.09 Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently-fixed equipment or furniture with a prime coat only, before final installation of the equipment.

3.10 Paint interior surfaces of ducts or plenums, where visible through registers or grilles, with a flat, non-specular black paint.

3.11 Paint the back sides of access panels and removable or hinged covers to match the exposed surfaces.

3.12 Finish all doors on the tops, bottoms and side edges the same as the exterior faces, unless otherwise indicated.

3.13 Sand lightly between each succeeding enamel or varnish coat.

SECTION 09900 – PAINTING

3.14 Metal work to be concealed upon completion, with the exception of open-web steel joists, shall be give one field coat in addition to the shop coats.

3.15 Paint exterior ferrous metal.

3.16 Paint prime-coated mechanical equipment, piping, and access panels exposed in occupied areas.

3.17 Paint equipment room walls and surfaces, unless otherwise scheduled.

3.18 Surfaces shall be smooth and free from raised grain or other defects after painting.

3.19 Each coat of paint and/or enamel shall be evenly worked out and allowed to dry before any subsequent coat is applied or any rubbing is done, with at least 48 hours drying time allowed between coats.

3.20 TINT EACH COAT A DIFFERENT SHADE FROM THAT OF THE PRECEDING COAT. FINISH COATS SHALL BE THE EXACT SHADES SELECTED.

3.21 Edges of paint adjoining other materials or other colors shall be full and clean-cut without overlapping.

3.22 Paint exposed ducts and piping, covered or uncovered, unless otherwise scheduled, the same color as adjacent surfaces.

3.23 Paint over interior exposed caulking with the color to match the trim of the adjacent wall.

3.24 Brush application is required for painting on metal work and for enameling and varnishing of woodwork. Other painting may be applied by spray, rollers, or brushes, at the discretion of the painting subcontractor, as long as all requirements of these Specifications are met.

3.25 On metal work to be concealed after the work is finished, use one field coat of paint after the prime or shop coat is spotted-in where scraped off. Paint for concealed metal shall be the same as for exterior metal work.

3.26 Omit the 1st coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise indicated.

3.27 Scheduling Painting (General): Apply the 1st-coat material to surfaces that have been cleaned, pretreated, or otherwise prepared for painting, as soon as practicable after preparation and before subsequent surface deterioration. Allow a sufficient time between successive coatings to permit proper drying. Do not recoat until the paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat. Repair scratched or rubbed places in final coats before the work is ready for acceptance. Surfaces in areas adjoining special coatings shall be painted after the coating application. Complete painting prior to the installation of the finish flooring.

SECTION 09900 – PAINTING

3.28 Minimum Coating Thickness: Apply each material at not less than the Manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated; or, if not indicated, as recommended by the coating Manufacturer.

3.29 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.

3.30 Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections. Provide satin finish for final coats, unless otherwise indicated.

3.31 Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work that is not incompliance with the specified requirements.

3.32 Clean-Up: During the progress of the work, remove from the site all discarded paint materials, rubbish, cans and rags, at the end of each work day. Upon completion of the painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage the finished surfaces.

3.33 Protection: Protect the work of other trades, whether to be painted or not, against damage by the painting and finishing work. Correct any damage by cleaning, repairing or replacing and repainting, as acceptable to the architect. Provide WET PAINT signs as required to protect newly-painted finished work. Remove temporary protective wrappings provided by others for the protection of their work, after completion of the painting operations. At the completion of the work of other trades, touch up and restore all damaged or defaced painted surfaces.

3.34 Preparation of Surfaces:

A. All surfaces shall be clean-free of dirt, grease and any foreign matter that would adversely affect the adhesion, finished appearance, or protective properties of special coatings.

B. If for any reason the surface cannot be properly prepared, the condition shall be reported to the General Contractor or Architect, who will be responsible for rectifying the unsatisfactory condition.

C. Coatings shall not be applied to surfaces with a temperature of less than 50 °F.

D. Ferrous Metal Surfaces: Remove all rust, mil scale and weld flux by power tool cleaning, (SSPC-SP-3-63) (Steel Structure Painting Council).

1. Remove weld flux spatters and alkali contaminants by washing with water.
2. Shop coated metal shall be washed free of grease, dirt, oil or dust with mineral spirits. Spot prime bare metal specified rust-inhibitive primer prior to painting, and prime with primer/undercoat as recommended by Manufacturer.

All products are to be installed in strict conformance with manufacturer’s recommendations.

(END OF SECTION 09900)

SECTION 13310 – TENSILE MEMBRANE STRUCTURES

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 the work of this section.

1.2 SUMMARY

A. This section includes an exterior architectural tensile membrane roof structure system.

B. The tensile membrane structure contractor (hereafter referred to as “Subcontractor”) shall be responsible for the structural design, detailing, fabrication, supply, and installation of the work specified herein, some or all of which may be contracted by Subcontractor to others meeting the qualification requirements of Section 1.5. The intent of this specification is to establish in the first instance an undivided, single-source responsibility of the Subcontractor for all of the foregoing functions.

C. Subcontractor’s work shall include, but not necessarily be limited to, the structural design, supply, fabrication, shipment, and erection of the following principal items:
   1. The architectural membrane as indicated on the drawings and in these specifications.
   2. Cables and end fittings.
   3. Perimeter, catenary, and sectionalized aluminum clamping system.
   4. Structural steel, including masts, trusses, struts, beams, and / or weldments, as indicated on the drawings.
   5. Fasteners and gasketing.

D. The architectural membrane used in these structures shall be polytetrafluoroethylene (“PTFE”, such as Teflon® coated woven fiberglass or approved equal). All references to “membrane” in this section, without exception, and whether singular, plural, capitalized or not, are to such architectural membrane.

E. Related Sections:
   1. 03010 – Cast-In-Place Concrete.

1.3 REFERENCES

A. General: Except as otherwise shown or noted, all work shall comply with the requirements of the following codes and standards:
   1. American Institute of Steel Construction (AISC).
      a. Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings
      b. Code of Standard Practice for Steel Buildings and Bridges
      c. Specification for Structural Steel Buildings – Allowable Stress Design and Plastic Design
      d. Specification for Allowable Stress Design of Single-Angle Members
      e. Seismic Provisions for Structural Steel Buildings

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2. American Society of Civil Engineers (ASCE)
   a. ASCE 19: Structural Applications of Steel Cables for Buildings
   b. ASCE 7: Minimum Design Loads for Buildings and Other Structures
3. America Society of Testing and Materials (ASTM)
   a. ASTM A 586: Standard Specification for Zinc-Coated Steel Structural Strand
   b. ASTM A 603: Standard Specification for Zinc-Coated Steel Structural Wire Rope
   c. ASTM A 780: Zinc Rich Paint Repairs
   d. ASTM A 153: Hot Dip Galvanizing
   e. ASTM D 4851-88: Standard Test Methods for Coated and Laminated Fabrics for Architectural Use
   f. ASTM A 36: Carbon Steel
   g. ASTM A 307: Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
   h. ASTM E 84:Standard Test Method and Surface Burning Characteristics of Building Materials
   i. ASTM 108: Standard Test Methods for Fire Tests of Roof Coverings
   j. ASTM 136: Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750° C
   k. ASTM C 423: Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
   l. ASTM E 424: Standard Test Method for Solar Energy Transmittance and Reflectance of Sheet Materials
   m. ASTM D 1117: Testing Non-Woven Fabrics
   n. ASTM B 221-08: Standard Aluminum and Aluminum Alloy Extruded Bars
   o. ASTM B 209: Standard Specification for Aluminum Sheet
4. America Welding Society (AWS)
   a. AWS D1.1: Structural Welding Code
   b. AWS 2.4: Symbols for Welding and Nondestructive Testing
5. Aluminum Association
   a. Specifications for Aluminum Structures
6. National Fire Protection Association (NFPA)
   a. NFPA 701: Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
7. Steel Structures Painting Council (SSPC)
   a. Steel Structures Painting Manual, Volumes 1 and 2

1.4 SYSTEM REQUIREMENTS

A. General: Provide a structural tensile membrane system that complies with requirements specified herein by testing the Subcontractor's corresponding membrane system in accordance with the indicated test methods.

B. Building Code Criteria: The tensile membrane structure shall comply with the Florida Building Code, 8th edition.

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As allowed by FBC 8th Edition provide signed & sealed engineered documents by a Florida registered engineer.

- Roof Live Load:
- Basic Wind Speed:
- Wind Load Importance Factor:
- Wind Exposure Category:

  If in a Seismic Zone recognized by Florida Building Code, provide verification of the following.

- Seismic Use Group:
- Seismic Importance Factor:
- Mapped Spectral Response Acceleration at Short Periods, Ss:
- Mapped Spectral Response Acceleration at 1-Second Period, S1:
- Seismic Site Class:
- Damped Spectral Response Coefficient at Short Periods, Sds:
- Seismic Design Category:

C. Life Safety: All tensile membrane structures shall be detailed so that no life safety issue is created in the event of a loss of a part of the membrane. The tensile membrane structure shall not rely on the membrane for structural stability.

D. Design of fabric canopies are to withstand the most critical effects of load factors and load calculations.

E. Fire Performance: Range of characteristics required of membranes:

1.	Burning Characteristics (ASTM E 84)	
	a. Flame Spread	5 max.
	b. Smoke Generation (Tunnel Test)	20 max.
2.	Fire Resistance of Roof Coverings (ASTM E 108)	
	a. Burning Brand	Class A
3.	Incombustibility of Substrates (ASTM E136)	
	a. Substrate Noncombustible	Pass
4.	Flame Resistance (NFPA 701 Small Scale, UL 94)	
	a. Flame Out	1 sec. after
	b. Char Length	0.25-inch max.

1.5 QUALITY ASSURANCE

SECTION 13310 – TENSILE MEMBRANE STRUCTURES

A. Subcontractor Qualifications: Fabrication and erection of the tensile membrane structure is limited to firms with proven experience in fabrication and construction of complex tensile membrane structures. Such firms, through their own experience and/or that of their qualified subcontractors, shall meet the following minimum requirements:
   1. The Subcontractor shall have at least ten (10) years' experience in the successful fabrication and erection of permanent, custom tensile membrane structures.
   2. The Subcontractor shall have fabricated and erected at least ten (10) PTFE-coated woven fiberglass tensile membrane structures, with at least five (5) structures of similar size and complexity as this project.
   3. Demonstrate it has maintained an professional engineering design staff for at least ten (10) years and will provide final engineering drawings that have been prepared by licensed Professional Engineers registered and licensed in the State of Florida.
   4. The Subcontractor shall demonstrate it has a fabrication facility of adequate capacity and a staff experienced in the fabrication of PTFE-Coated woven fiberglass tensile membrane structures that will undertake the fabrication of this project.
   5. The Subcontractor shall submit a Corporate Quality Control Manual describing the company's complete quality assurance program.
   6. All bidders will need to provide a Payment & Performance Bond. The bidder needs to provide proof of a minimum bonding capacity of $1,000,000 by providing a signed letter from their surety company with their bid.
   7. All bidders shall be able to provide proof with their bid of a minimum of $2,000,000 general/public liability insurance, $3,000,000 professional liability (PL) insurance and additional $4,000,000 umbrella/excess liability insurance.
   8. The Subcontractor must demonstrate their company's steel fabrication capability.

1.6 SUBMITTALS

A. Submit under provision of Section 01330 – Submittal Procedures.

B. Must submit a letter that the subcontractor is certified as a design/ engineer, fabricator, installer and post service provider approved by the membrane supplier.

C. General: Not withstanding any provisions of these specifications that may appear to be to the contrary, any and all submittals by the Subcontractor shall be subject to review, approval, and adoption by the Architect/Engineer as part of the overall project design and engineering and shall not create a contractual or other professional design relationship between the Subcontractor and either the Architect/Engineer or the Owner.

D. Product Data: Include manufacturer's specifications for materials, fabrication, installation, and recommendations for maintenance. Include test reports showing compliance with project requirements where test method is indicated.
   Sample: Submit selection and verification samples.

E. Design Drawings: Subcontractor shall submit tensile membrane structure drawings defining the completed structure, anchorage, and connection details, interfaces with building construction and general membrane seam arrangements. Design Drawings are to be signed and sealed by a Professional Engineer in the State of Florida.

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F. Design Calculations: Subcontractor shall submit complete calculations for the tensile membrane structure, as one package with the design drawings, signed and sealed by a Professional Engineer licensed in the State of Florida. Structural calculations shall include all required loading cases and load combinations used in the design and resulting member forces, reactions, deflections and drift. The magnitude of maximum reactions on the supporting structures from all critical load combinations shall be separately tabulated. Critical load conditions used in the final sizing of the members shall be emphasized. The design analysis shall include the name and office phone number of the designer to answer questions during the design drawing review.

G. Quality Assurance Submittals
   1. Test Reports: Provide test reports from a qualified testing laboratory that show compliance of the Subcontractor's PTFE-coated woven fiberglass tensile membrane system with specification requirements, as follows:
      a. Physical test data of the actual fabric roll goods to be used in the project confirming conformance with specifications for the membrane.
   2. Certificates: Product certificates signed by the Subcontractor certifying materials comply with specified characteristics, criteria, and physical requirements.

G. See Section – 1700 – Close-out Procedures: Submit the following items:
   1. Warranty: Project Warranty documents as described herein.
   2. Record Documents: Project record documents for installed materials in accordance with Contract Conditions and Division 1 Submittal Procedures Section.
   3. Maintenance Manual: Submit one (1) copy of a maintenance manual for the tensile membrane structure to the owner. The manual shall include a schedule for routine inspection, and inspection checklist, instructions for emergency repair and use of emergency repair materials, and warranty. During the system erection period, the owner shall provide maintenance personnel to be trained in the se of repair materials.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

A. See Section – 01620 – Product Requirements.

B. Materials shall be packed, loaded, shipped, unloaded, stored and protected in a manner that will avoid abuse, damage, and defacement.

1.8 WARRANTY

A. The Subcontractor shall furnish the Owner with a written warranty, which warrants the membrane, its perimeter attachment system, and the structural support system as supplied by the Subcontractor have been installed in accordance with the project specifications and will be free from defects in materials and workmanship that will impair their normal use of service. The warranty shall start from the date of substantial completion of the tensile membrane structure, which shall be the first date on which the entire tensile membrane structure is subject to design pre-stress conditions and continue for a period of five (5) years thereafter.

B. One (1) year workmanship warranty on installed products
Ten (10) year structural warranty on structural steel and cables

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One (1) year warranty on paint system
Manufacturer's standard pass thru warranty on fabric

PART 2 – MATERIALS

2.1 QUALIFIED CONTRACTOR

A. BASIS FOR DESIGN IS:
FabriTec Structures LLC
1011 Regal Row
Dallas, TX 75247
Tel: 704.280.1719

B. Sundance Architectural Metal Products Orlando, FL, (407) 493-8052 is an approved manufacturer of pre-engineered pavilion structures.

C. Span System Inc as an approved manufacturer of pre-engineered amphitheater structures, (917) 319-2139 / (603) 838-0611.

D. Or approved equal. Substitution requests section 01100 Alternates & Substitutions if not identified in part 2 of this specification must be submitted by a prime bidder a minimum of seven (7) days prior to bid date. Any approved equals shall be issued by addendum only, prior to the bid date.

E. Approved bidders must meet all qualifications in Section 1.5 – Quality Assurance and show written proof for each item listed to become an approved equal.

2.2 ARCHITECTURAL MEMBRANE

A. General: The membrane used in these structures shall be polytetrafluoroethylene ("PTFE", such as Teflon®) coated woven fiberglass or an approved equal by Architect. All references to "membrane" in this section, without exception, and whether singular, plural, or capitalized or not, are to such architectural membrane.

B. The membrane shall meet or equal to the following general requirements:
1. Source Quality Control: The primary materials shall be obtained from a single manufacturer. Secondary materials shall be those recommended by the primary manufacturer.
2. Physical Characteristics: The following indicates a range of physical property types for PTFE architectural membranes. The determination of specific characteristics and selection of a membrane shall be derived from analysis and calculations carried out by the Professional Engineer for this project.
   a. Coated Fabric Weight (oz/sq. yd) (ASTM 4851) — 24-45.5 nom.
   b. Thickness (mils) (ASTM 4851) — 18 – 36 nom.
   c. Strip Tensile (lbs./in.,avg.)

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1) Dry, Warp (ASTM 4851)	520 min. – 975 min. avg.
2) Dry, Fill (ASTM 4851)	380 min. – 900 min. avg.

d. Tensile after Flexfold (lbs/in.., avg.)

1) Dry, Warp (ASTM 4851)	375 min. – 760 min. avg.
2) Dry, Fill (ASTM 4851)	350 min. – 735 min. avg.

e. Trapezoidal Tear (lbs. avg.)

1) Warp (ASTM 4851)	35 min. – 95 min. avg.
2) Fill (ASTM 4851)	35 min. – 120 min. avg.

f. Solar Transmission (%) (ASTM 424) 7 – 22 nom.

g. Solar Reflectance (%) (ASTM 424) 70 – 75 nom.

C. Materials

1. Base Fabric: The yarns used shall be of the highest commercial quality, essentially free of broken fibers and fully suitable for coating. The fabric shall be woven with uniform tension and crimp in the warp and fill yarns and free of defects deleterious to the coating process.
2. Fluorocarbon Coatings: The coating materials shall be fluorocarbon resins formulated specifically for architectural applications. These materials shall be applied to form a weatherized barrier between the fiberglass yarns and the environment. The bulk of the coating shall be formulated dispersions of PTFE fluoropolymer resin and additives to enhance abrasion and tear resistance, impart pigmentation or modify solar transmission. The additives shall not constitute more than 20 percent by weight of the total coating or 25 percent by weight of any individual layer. The surface shall be totally a fluoroethylenepropylene (“FEP”) resin to facilitate heat welding.
3. After weaving, the base fabric shall be cleaned and primed to achieve optimum mechanical properties of the coated membrane. The coating, described above, shall be virtually free of mud cracks and pinholes. The coating shall be applied evenly to both sides of the fabric and the FEP fluorocarbon resin topcoat shall be of sufficient thickness to permit proper heat fusion of joints with the recommended die pressure and temperature.

2.3 CABLE AND END FITTINGS

A. Materials

1. All structural wire rope cables shall conform to the latest revision of ASTM A 603.
2. All structural strand cables shall conform to the latest revision of ASTM A 586.
3. All cables shall be coated to “Class A” zinc coating throughout.
4. All cables in contact with the membrane shall be white PVC coated. All other cables may be galvanized only.

B. Fabrication

1. Cable fabricator shall provide effective quality control over all fabrication activities. Inspection of the place of fabrication may occur at any time to verify proper quality control. This inspection does not relieve the fabricator from meeting the requirements of this specification.

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2. Cables that are designated to be pre-stretched shall be pre-stretched per ASTM A 603 for wire rope and ASTM A 586 for structural strand. Cables of the same type shall have the same modulus of elasticity.
3. All cables shall be manufactured to the following length tolerances at 70° Fahrenheit (23° Celsius):
   a. Length < 70 feet (213 meters) ¼ inch (6.4mm)
   b. Length 70 to 270 feet (32.3 to 82.3 meters) 0.03% of length
   c. Length > 270 feet (82.3 meters) 1 inch (25.4 mm)
4. Cables shall have a continuous longitudinal paint stripe (1/8 inch wide max.) along their top surface unless noted otherwise.
5. Index markings shown shall be a circumferential paint stripe (1/8 inch wide max.).
6. All cables and end fittings shall be delivered clean and dry.
7. All swaged and speltered fittings shall be designed and attached to develop the full breaking strength of the cable. Thimble end fittings shall develop a minimum of 90 percent of the cable breaking strength.
8. Swaged end fittings, pins, nuts, and washers shall be electro-galvanized. Any damage to the zinc coating shall be cleaned and painted with gray zinc-rich paint per ASTM A 780.
9. Speltered end fittings shall be hot dip galvanized per ASTM A 153. Any damage to the zinc coating shall be cleaned and painted with a gray zinc-rich paint per ASTM A 780.

2.4 ALUMINUM CLAMPING SYSTEM

A. Materials
   1. All structural aluminum clamping systems shall be ASTM alloy 6061-T6.
   2. Bent Plates shall be formed from ASTM B 221-08 alloy 6061 and then heat-treated to T6.
   3. All structural “U straps” shall be ASTM B 221-08 Aluminum Alloy 6063, heat-treated to T5.
   4. All structural aluminum clamping shall have the following finish:
      a. Polyester thermosetting powder coating with a tri-glycidyl di-isocyanurate (i.e. TGDI) curing agent/hardener per American Architectural Manufacturers Association (AAMA) 603 to a thickness of 3 mils, whit in color

         OR

      b. Clear anodized per MIL-A 8625C, Type 2, Class 1.
   5. Structural sheet aluminum shall be ASTM B 209 alloy 5052-H32.
   6. Non-structural sheet aluminum shall be ASTM B 209 alloy 1100 series.

B. Fabrication
   1. Aluminum fabricator shall provide effective quality control over all fabrication activities. Inspection of the place of fabrication may occur any time to verify proper quality control. This inspection does not relieve the fabricator from meeting requirements of this specification.
   2. Fabricated aluminum shall have no sharp edges.
   3. Stamp all parts with the appropriate mark number.
   4. All fabricated aluminum shall be free of oil, grease, and machining chips.
   5. Tolerances shall be as follows:
      a. Cross sectional dimensions +/- 10%, 0.03 in. (0.8 mm) max.
      b. Bolt hold locations +/- 1/32 in. (0.8 mm)
      c. Overall length +/- 1/16 in. (1.6 mm)

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6. All welded joints shall conform to AWS D1.2.

2.5 STRUCTURAL STEEL

A. General: The structural steel fabrication shall comply with the latest revision of all applicable codes, standards and regulations including the following:
   1. ASTM (as referenced)
   2. AISC: "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" and "Code of Standard Practice for Steel Buildings and Bridges"
   3. SSPC: "Steel Structures Painting Manual, Volumes 1 and 2"
   4. Research Council on Riveted and Bolted Structural Joints: "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts"
   5. AWS D1.1 and AWS A2.4

B. In the event of conflict between pertinent codes and regulations and the requirements of the references standards or these specifications, the provisions of the more stringent shall govern.

C. Submittals
   1. General: Submit the following under provisions of Section 01330 – Submittal Procedures.
   2. Shop Drawings:
      a. The structural steel fabricator shall submit shop drawings to the Subcontractor for approval.
      b. The drawings shall show all shop and erection details including cuts, copes, connection holes, threaded fasteners, bolts, stands and spacing, etc.
      c. The drawings shall show all welds, both shop and field, by the currently recommended symbols of the AWS.
      d. A welding procedure must be submitted to the Subcontractor for approval of welds that are not pre-qualified.
      e. Shop drawings shall be carefully checked before being submitted for approval and shall be submitted in the order in which they are needed for the executive of the work, well in advance and not all at one time. Submitted drawings shall show all structural steel required for the work, whether or not indicated on the drawings.
      f. The fabricator shall not fabricate any material until after receipt of approved shop drawings.
      g. The fabricator shall immediately make all corrections to his drawings as required by the Subcontractor and shall keep a satisfactory history of all changes by separately numbered and dated revision block on a convenient portion of each drawing affected.
      h. Certification of material conformance that includes chemical and physical properties for all structural elements shall be submitted to the Subcontractor.
      i.

D. Materials
   1. Structural steel for plates and bars shall conform to the requirements of ASTM A 36 or ASTM A 572, Grade 50, unless noted otherwise.
   2. Structural pipe shall conform to ASTM A 53, Types E or S, Grade B.

SECTION 13310 – TENSILE MEMBRANE STRUCTURES

3. Structural tubing shall conform to ASTM A 50, Grade B or C.
4. Structural bolts
   a. High strength bolts: ASTM A 325, unless noted otherwise
   b. Common bolts and nuts: ASTM A 307
   c. Threaded rods: ASTM A 36, unless noted otherwise
5. Other materials: All other materials, not specifically described but required for a complete and proper installation of structural steel, shall be provided and shall be new, free from rust, first quality of their respective kinds, and subject to the approval of the Subcontractor.

E. Accessories
   1. Base Plates and Anchor Bolts
      a. Base plates supported on concrete, whether shop attached or shipped loose, shall be furnished and set on shims or leveling plates. Grouting shall be by the General Contractor.
      b. Anchor bolt locations shall be furnished by the Subcontractor and used by the General Contractor to set the bolts. The General Contractor is to check carefully the setting of the bolts to their proper position prior to pouring of concrete. Anchor bolts, provided by the General Contractor, shall have two (2) nuts and washers. Damaged threads shall be repaired or be cut to permit full tightening of nuts.

F. Fabrication
   1. Workmanship: All members when finished shall be true and free of twists, bends, and open joints between the components parts. Members shall be thoroughly straightened in the shop by methods that will not injure them, before being worked on in any way.
      a. Properly mark materials, and match-mark when directed by the Subcontractor, for field assembly.
   2. Connections:
      a. Connections shall be as indicated on the drawings. When details are not shown the connections shall conform to the requirements of the AISC.
      b. Provide high-strength threaded fasteners for all structural steel bolted connections, unless noted otherwise.
      c. Combination of bolts and welds in the same connection are not permitted, unless otherwise detailed.
      d. Welded Connections
         1) Definitions: All terms herein relating to the welds, welding and oxygen cutting shall be construed in accordance with the latest revision of “Standard Definitions of Welding Terms and Master Chart of Welding Processes” of the AWS.
         2) Operators: only operators who have been previously qualified by tests, as prescribed in AWS D1.1 to perform the type of work required shall make Welds.
         3) Welding equipment shall be of sufficient capacity and maintained in good working condition, capable of adjustment in full range of current settings. Welding cables shall be adequate size for the currents involved and ground methods shall be such as to insure proper machine operation.
         4) No welding shall begin until joint elements are clamped in proper alignment and adjusted to dimensions shown on the drawings and allowance for any weld shrinkage that is expected. No members are to be spliced without prior approval.

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5) All welding shall be done in accordance with the reference specifications, with the following modifications and additions:
   a) All field welding shall be done by manual shielded metal-arc welding.
   b) All groove welds shall have complete penetration, unless otherwise specified on the drawings.
   c) The minimum pre-heat and inter-pass temperature requirements shall be as required per AWS D1.1.
6) Welding Sequence: Heavy sections and those having a high degree of restraint must be welded in a sequence with the proper preheat and post-weld heat treatment such that no permanent distortion occurs. Submit a welding sequence for approval for these types of connections.
7) Oxygen Cutting: Manual oxygen cutting shall be done only with a mechanically guided torch. Alternatively, an unguided torch may be used provided the cut is not within ½ inch of the finished dimension and the final removal is completed by chipping or grinding to produce a surface quality equal to that of the base metal edges. The use of oxygen-cut holes for bolted connections will under no circumstances be permitted and violation of this clause will be sufficient cause for the rejection of any pieces in which oxygen-cut holes exist.

3. Tolerances: All tolerances shall be as per the AISC "Code of Standard Practice for Steel Buildings and Bridges".
4. Paint System, Three-Part:
   a. Source Quality Control: Primary materials shall be obtained from a single manufacturer. Second materials shall be those recommended by the primary manufacturer.
   b. Surface Preparation and Base Coat
      1) The surface shall be commercial blast cleaned in conformance with SSPC-SP10, after all fabrication operations such as machining and welding are completed. There shall be no more than an eight-hour time lapse between the surface preparation and the application of the primate coat.
      2) The base coat shall be Sherman Williams inorganic zinc rich coating (zinc clad II ethyl silicate). Color gray-green or approved equal and shall conform to SSPC-Paint 20.
      3) The primer shall be mixed and applied in accordance with the manufacturer's instructions and shall meet the requirements of SSPC Paint Specification No. 20. The minimum thickness shall be 2.0 to 4.0 mils dft.
   c. Intermediate Coat
      1) The intermediate coat shall be Sherman Williams Macropoxy 646 fast cure epoxy color Mil white or light blue or approved equal and shall conform to SSPC Paint Specification 22.
      2) The surface preparation is to conform to SSPC-SP10/NANCE 2.
      3) The intermediate coat shall be applied in accordance with the manufacturer's instructions. The minimum thickness shall be 4.0 – 6.0 mils dft.
   d. Finish Coat
      1) The finish coat shall be Sherman Williams Hi-Solid Polyurethane (semi-gloss), or approved equal, and shall conform to SSPC – Paint number 36, Level 3.
      2) The finish coat shall be mixed and applied in accordance with the manufacturer's instructions and the minimum thickness shall be 3.0 to 4.0 mils dft.
   e. Three-Part System Thickness: The minimum system thickness shall be 10.0 mils dft.

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f. Color: The paint color shall be as selected by the Architect.
g. Finish Quality: The dry paint shall be uniform and continuous with no voids or puddles and shall not be broken by scratches or nicks. Although the Subcontractor's Quality Assurance personnel may witness the painting operation, this does not relieve the Painting Subcontractor of the responsibility for meeting the quality and workmanship requirements of these specifications.
h. Care and Handling: The painting subcontractor shall make every reasonable effort to ensure that the painted steel is thoroughly dry and that it is handled carefully to prevent damage to the paint and to reduce field repairs. Nylon slings should be used when handling the painted steel.
i. Certification: The painting subcontractor shall be required to certify the paint manufacturer's name, paint identification, conformance with manufacturer's written instructions, and the paint dry mil thickness.

G. Source Quality Control:
1. Testing
a. An independent testing laboratory paid for by the owner shall perform testing and inspection of the structural steel and welding. All welds shall be tested by visual, dye penetrant, magnetic particle methods in accordance with instructions from the Subcontractor.
b. The Subcontractor and the testing laboratory inspector shall be permitted to inspect the work in the shop or field throughout fabrication and erection.
c. The inspector shall check for workmanship of steel, both in the shop and field, and check general compliance with the contract documents and steel shop drawings. The inspector shall record types and locations of all defects found in the work and measures required and performed to correct such defects.
d. The steel fabricator shall make all repairs to defective work to the satisfaction of the inspector and at no additional cost to the Subcontractor.
e. The inspector shall submit reports of his inspection and test findings to the Subcontractor. He shall record all defects found with the subsequent repair operations and submit reports to the Subcontractor.
f. The work of the independent inspector shall in no way relieve the steel fabricator of his responsibility to comply with all requirements of the contract documents.

H. Product Handling and Protection: Use all means necessary to protect structural steel before, during, and after installation, and to protect the installed work and materials of all other trades.

I. Rejection and Replacement:
1. In the event of damage to the steel, immediately make all repairs and replacements necessary to the approval of, and at no additional cost, to the Subcontractor.
2. Any materials or welding rejected through inspection either in the shop, mill, or field must be promptly replaced to the satisfaction of, and at no additional cost to, the Subcontractor.

J. Qualifications of Steel Fabricator: The steel fabricator shall have not less than five (5) years continuous experience in the fabrication of structural steel.

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2.6 FASTENERS

A. General: Provide fasteners used to secure clamp systems to curbs and cables, assemblage of clamp systems, and other fasteners as required to complete the work specified herein.

B. Materials:
1. All work shall comply with the latest edition of ASTM standards and American Iron and Steel Institute (AISI), as referenced herein.
2. Fasteners used in membrane clamping systems shall be stainless steel. Bolts and studs shall conform to ASTM F 593, type 304. Nuts shall conform to ASTM F 594, Type 316. Washers shall be plain, narrow, and conform to AISI Type 18-8.
3. All clamping systems subjected to relative movement between clamping and curb shall receive a split-ring lock washer conforming to AISI Type 18-8.
4. Unless otherwise specified on the drawings, all other bolts and nuts shall conform to ASTM A 307-76B, zinc plated to conform to ASTM B 633 Class FE/ZN 8 type III.

C. Source Quality Control: The manufacturer shall certify that all fasteners comply with the above referenced specifications.

2.7 GASKETING

A. General: All work shall comply with the latest edition of ASTM standards, as referenced herein.

B. Sponge Neoprene Gasketing:
1. Material
a. All sponge neoprene shall be of a cellular elastomeric compound of a firm grade, which has been manufactured in pre-formed shapes for use as gasket and sealing material, as specified in ASTM specification C 509.
b. Cellular elastomeric materials furnished to this specification shall be manufactured from natural or synthetic rubber, or mixtures of these, with added compounds of such nature and quality that, with proper curing, the finished product will comply with this specification.
c. The cured compounds shall be suitable for use where resistance to sunlight, weathering oxidation and permanent deformation under load are of prime importance.
d. The manufacturing process shall be such as will ensure a homogeneous cellular material free of defects that may affect serviceability.
e. The physical characteristics of the neoprene must meet or excess ASTM C 509, “Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Materials.”
f. Certification of material shall be provided that conforms to ASTM C 509.

C. Dense Neoprene Gasketing:
1. All neoprene material shall conform to ASTM D 2000M hardness Grade 60. The material shall be homogenous, free from defects and shall be compounded and cured to meet the requirements specified herein.

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2. All neoprene shall be non-staining formulation and shall consist of at least 50 percent by weight of basic rubber hydrocarbon. Material shall not contain crude or reclaimed rubber.
3. The physical characteristics of the neoprene must meet or exceed the following physical test requirements when tested using the standard ASTM test slab can compression set plug (or approved equal):

	PROPERTY	ASTM METHOD	UNITS
a.	Shore A Durometer	D2240	55-65
b.	Tensile Strength (Min.)	D 412	1,100 psi
c.	Percent Elongation (Min.)	D 412	300%
d.	Percent Compression Set (Max.)	D395, Method B, 22hrs at 212^{o} F	35%
e.	Heat Aging, Change from original properties:		
	● Hardness Change (Max.)	+15 Points Shore A	
	● Tensile Strength (Max.)		-15%
	● Elongation Change (Max.)	-40%	
f.	Flame Resistance		Must not propogate flame
g.	Temperature Range		-30^{o}C to -100^{o}C
h.	Ozone Resistance	D1171, Method A, 72 hrs @ 38^{o}C and 50 mPa Ozone	
i.	Resistance to Oil Aging:	D471, 70hrs @ 212^{o}F Immersion in ASTM Oil No.3	
	● Tensile Strength (Max.)		-70%
	● Elongation (Max.)		-55%
	● Volume Change (Max.)		+120%

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2.8 MAINTENANCE KIT

A. Architectural Membrane Maintenance Kit: The owner shall be supplied with the following materials for emergency repair or maintenance. The materials shall be neatly packaged into a maintenance kit for storage by the owner.

QUANTITY	DESCRIPTION
• 6	12-inch diameter patch with FEP sheets
• 12	5-inch diameter patch with FEP sheets
• 12	4-inch x 8-inch rectangular patch with FEP sheets
• 6 sq. yds.	Outer Membrane
• 200 ft.	FEP tape, 3 inches wide
• 1	Soldering iron, 500W with wedge tip
• 1	Tacking sealer, 3-inch x 5-inch die
• 2	Insulating bearing blocks
• 1	5/8-inch hole punch
• 1	Utility knife
• 50	Repair clips
• 1	Spool of No. 36 nylon twine
• 36 yds.	Comar B29/4 x 15 Kevlar® thread
• 1	Hand awl
• 1 pkg.	C-29 needles
• 1	Repair Manual

PART 3 – FABRICATION AND ERECTION

3.1 FABRICATION OF MEMBRANE PANELS

A. General

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1. Membrane assembly design drawings shall include all information necessary for the fabrication by the Subcontractor of the tensile membrane structure. They shall include size and shape of envelope, type and location of shop and field connections, size, type and extent of all heat-welded seams.
2. The Subcontractor shall take necessary care to plan and assemble the fabricated sections such that the assembly has not shop patches. Splices, if any, shall be patterned into a symmetrical and repetitive geometric arrangement within the assembly, shown on the design drawings and, where feasible, hidden by structural members.
3. All fabricated joints shall have a minimum of 90 percent of the total strength of the coated membrane in strip tensile testing. All structural joints shall be fused in accordance with industry standards and shall maintain the integrity of the coating. PTFE-coated woven fiberglass membranes shall be heat-sealed only.
4. Biaxial Test: At least one (1) representative sample of the outer membrane shall be biaxially test loaded. Membrane compensation in patterning shall be based upon results of the biaxial test loading.

3.2 ERECTION OF MEMBRANE ASSEMBLIES

A. Prior installation of the membrane assemblies, the Subcontractor shall meet with the General Contractor to review the erection procedure and scheduling. The Subcontractor shall coordinate all work with other trades.

B. No trade shall have access to, or work from the membrane, unless authorized by the Subcontractor in writing.

C. Erection of structural steel
   1. The Subcontractor shall employ a competent foreman to supervise all work of steel erection. This foreman shall be present at all times during the Subcontractor's scope of work.
   2. All precautions shall be taken to ensure an accurately located and completely safe and stable structure at all times. Adequate guy cables shall be used throughout the work and all erection bolts shall be drawn up tight.
   3. All steel shall be accurately aligned before permanent connections are made.
   4. Temporary bracing shall be left in place as long as may be required for safety. The bracing shall be located so it does not interfere with the erection for the tensile membrane structure and can be removed as required during construction.
      a. The structure is to be self-supporting and stable after the structure is fully completed. It is the Subcontractor's sole responsibility to determine the erection procedure and sequence and to ensure the safety of the structure and its component parts during erection. This includes the additional of whatever temporary bracing, guys or tie-downs that may be necessary. Such materials shall be removed by the Subcontractor and remain his property after completion of the property.
   5. Erection tolerances shall be specified in the AISC "Code of Standard Practice for Steel Buildings and Bridges", unless otherwise noted.

3.3 CLEANING

A. Protect work from damage and deterioration during installation.

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B. Upon completion of tensile membrane structure installation:
   1. The Subcontractor shall clean all surfaces of the system's components in conformance with the membrane manufacturer's recommendations.
   2. Inspect the system and repair membrane panels that become damaged. Repairs shall be executed in such a way that they are visually acceptable.

C. Repairs:
   1. Inspect the system and repair membrane panels that have become damaged.
   2. Repairs shall be neatly made and shall not exceed 12 inches in diameter. Repairs shall be limited to one for each 3,000 square feet of fabric and no more than 3 repairs for the entire shade structure system.

D. Steel Cleaning:
   1. Cleaning and touchup steel finishes field welds, bolted connections and abraded areas shall be completed per the manufacturer's field repair recommendations.

(END OF SECTION 13310)