

PROJECT MANUAL

For the

PROJECT CHALLENGE PLAYHOUSE

**NEW STORAGE BUILDING
& SITE IMPROVEMENTS**

For

**ANDERSON SCHOOL DISTRICT FIVE
ANDERSON, SOUTH CAROLINA**

BID SET

McMillan Pazdan Smith

Spartanburg, South Carolina

Project No. 015048.00

February 14, 2016

TABLE OF CONTENTS
PROJECT CHALLENGE PLAYHOUSE – NEW STORAGE BUILDING & SITE IMPROVMENTS

Division	Section Title	Pages
----------------	---------------------	-------

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

..... Invitation to Bid	1
..... Instruction to Bidders with Modifications.....	11
..... Bid Form.....	3
..... General Conditions of the Contract with Modifications.....	45
..... Construction Agreement	6
..... AIA Document A310 Bid Bond.....	1
..... AIA Document A312 Performance Bond and Payment Bond	8
..... AIA Document G701-2001 Change Order	1
..... AIA Document G702 Application and Certification for Payment.....	1
..... AIA Document G706 Contractor's Affidavit of Payment of Debts and Claims.....	1
..... AIA Document G707 Consent of Surety to Final Payment.....	1
..... Request for Substitute Form	10
..... Asbestos Free Certification	1
..... Moisture Control Certification.....	2
..... Certification of ADA Compliance	1

SPECIFICATIONS GROUP
General Requirements Subgroup

DIVISION 01 - GENERAL REQUIREMENTS

01 09 50	Reference Standards and Definitions	11
01 10 00	Summary.....	3
01 14 00	Work Restrictions.....	9
01 21 00	Allowances	4
01 22 00.....	Unit Prices.....	2
01 26 00	Contract Modification Procedures.....	3
01 29 00	Payment Procedures	5
01 31 00	Project Management and Coordination	6
01 31 19	Project Meetings	10
01 32 00	Construction Progress Documentation	4
01 33 00	Submittal Procedures.....	8
.....	CADD Release Form	2
01 40 00	Quality Requirements	7
01 50 00	Temporary Facilities and Controls	6
01 60 00	Product Requirements	4
01 73 00	Execution	9
01 74 19	Construction Waste Management and Disposal.....	8
01 77 00	Closeout Procedures	6
01 78 23	Operation and Maintenance Data.....	8
01 78 39	Project Record Documents	4
01 79 00	Demonstration and Training.....	2

DIVISION 03 – CONCRETE

03 30 00	Cast In-Place Concrete.....	.22
----------------	-----------------------------	-----

DIVISION 05 – METALS

05 50 00 Metal Fabrications..... 13
05 52 13 Pipe and Tube Railings..... 6

DIVISION 06 – NOT USED

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

07 21 00 Thermal Insulation 4
07 27 26 Fluid-Applied Membrane Air Barriers..... 7
07 72 00 Roof Accessories 4
07 92 00 Joint Sealants 11

DIVISION 08 – OPENINGS

08 11 13 Hollow Metal Doors and Frames 9
08 33 23 Overhead Coiling Doors..... 5
08 71 00 Door Hardware..... 14

DIVISION 09 – FINISHES

09 05 71 Sealing Concrete Slabs and Floors 6
09 22 16 Non-Structural Metal Framing..... 4
09 91 13 Exterior Painting..... 6

DIVISION 10 – SPECIALTIES

10 44 13 Fire Extinguisher Cabinets..... 5
10 57 10 Metal Shelving 5
10 73 13 Manufactured Metal Canopies 6

DIVISION 13 – FINISHES

13 34 19 Metal Building Systems..... 11

Site and Infrastructure Subgroup

DIVISION 31 - EARTHWORK

31 10 00 Site Clearing..... 6
31 20 00 Earthwork..... 9
31 25 00 Environmental Protection..... 10
31 31 16 Termite Control 4

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 13 13..... Concrete Paving..... 14
32 32 16 Hot-Mix Asphalt Paving..... 9
32 92 00 Grassing..... 9

END OF TABLE OF CONTENTS

Invitation to Bid

Sealed bids for Project Challenge Playhouse New Storage Building & Site Improvements, Anderson School District Five. The bids will be received at 2:00 pm on March 9, 2016 at the District Office of Anderson County School District Five, 400 Pearman Dairy Road, Anderson SC 29625, and read aloud.

Hard copies of bidding requirements, plans, specifications and addendums may be purchased directly from ARC, 7092 Howard Street, Spartanburg SC 29303. To pre-order sets, contact Susan Wilson at 864-585-8388. To electronically view the bidding requirements, plans and specifications free of charge, email Susan Wilson at Susan.Wilson@e-arc.com to receive the direct link to the Plan Room for this project. **NOTE: In order to receive electronic notification concerning the release of addenda, bidders and sub-bidders must register their intent to bid this project with Debbie Greene at McMillan Pazdan Smith Architecture (dgreene@mcmillanpazdansmith.com or 864-585-5678).**

Questions during bidding shall be submitted in writing to Michael Chewning, AIA, LEED AP mchewning@mcmillanpazdansmith.com

The list of the Pre-Qualified General Contractors listed below. All other vendors, suppliers, etc. shall meet the requirements of the plans and specifications.

Clayton Construction Company, Inc.

Jon Scot General Contractors, LLC

Lazer Construction Company, Inc.

Marsh/Bell Constructions Company, Inc.

Matrix Construction Company, Inc.

Melloul-Blamey Construction SC, Inc.

All bids shall be accompanied by a certified check or bid bond, in the amount of 5% of the base bid payable to Anderson County School District Five, Board of Trustees.

The successful bidder will be required to furnish and pay for satisfactory performance and payment bonds in the amount of 100% of the contract sum.

No Bid shall be withdrawn for a period of Thirty (30) days subsequent to the opening of the bids without the consent of the owner.

The Owner reserves the right to reject any or all bids or to waive any informalities in the bidding.

Applicants must have a current contractor's license in the state of South Carolina, and must be qualified under the provision of the contractor's licensing law (1962 Code, Section 56-402-28 as amended) This project is covered under provisions of code of laws of South Carolina (1976 Title 40, Chapter 11) and as amended.

A Mandatory Pre-Bid Conference for all Pre-Approved General Contractors will be held at 9:00 a.m. February 23, 2016 at the Project Challenge Playhouse, 2005 N. Main Street Anderson, SC 29621.

Board of Trustees
Anderson School District Five
Anderson S.C. 29625
February 14, 2016



ANDERSON SCHOOL DISTRICT FIVE

PURCHASING DEPARTMENT

400 PEARMAN DAIRY ROAD

ANDERSON, SC 29622

December 1, 2015

Notice

AFTER A THOROUGH REVIEW OF ALL REQUESTS FOR QUALIFICATIONS THAT WERE RECEIVED BY 2:00 P.M. on WEDNESDAY, NOVEMBER 11, 2015, THE DISTRICT HAS PRE-QUALIFIED THE FOLLOWING CONTRACTORS TO BID ON THE PROJECT CHALLENGE PLAYHOUSE PROJECT.

The contractors are as follows:

- 1) Clayton Construction Company, Inc.
- 2) Jon Scot General Contractors, LLC
- 3) Lazer Construction Company, Inc.
- 4) Marsh/Bell Construction Company, Inc.
- 5) Matrix Construction Company, Inc.
- 6) Melloul-Blamey Construction SC, Ltd.

An Invitation to Bid will be forthcoming.

We sincerely appreciate your interest in Anderson School District Five and your participation in this process.

A handwritten signature in cursive script that reads 'Pamela G. Hassan'.

Pamela G. Hassan, MHRD, CPPO, CPPB
Director of Purchasing

ANDERSON SCHOOL DISTRICT FIVE

INSTRUCTIONS TO BIDDERS FOR

PROJECT CHALLENGE PLAYHOUSE RENOVATIONS PROJECT BIDS

ARTICLE 1 DEFINITIONS

1.1 Bidding Documents include the Bid Requirements and the proposed Contract Documents.

1.1.1 Bid Requirements consist of the Invitation for Construction Bids, Instructions to Bidders, Bid Form, any supplemental Instructions to Bidders included in the Bidding Documents, and all Addenda issued prior to the receipt of Bids.

1.1.2 Contract Documents consist of the Agreement Between District and Contractor (as modified), the General Conditions of the Contract for Construction (as modified), the Scope of Work as indicated on the Plans and the Specifications, and Contract Modifications issued after execution of the Contract. The Contract Documents shall govern the Work under all Divisions and Sections the same as if incorporated therein.

1.1.3 Contract Modifications may be one of the following:

- .1** A written amendment to the Contract signed by both parties;
- .2** A Change Order;
- .3** A Construction Change Directive;
- .4** A written order for a minor change in the Work issued by the Architect.

1.2 Definitions set forth in the General Conditions of the Contract for Construction or in other Contract Documents are applicable to the Bidding Documents.

1.3 Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

1.4 A Bid is a complete and properly executed Proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.

1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

1.8 A Bidder is a person or entity who submits a Bid to the District.

1.9 A Sub-Bidder is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

1.10 An Architect is a person or firm who performs professional services associated with the practice of architecture, professional engineering, land surveying, landscape architecture and interior design pertaining to construction, as defined by the SC Code of Laws, as well as incidental services that members of these professions and those in their employ may logically or justifiably perform, including studies, investigations, surveys, evaluations, consultations, planning, programming conceptual designs, plans and specifications, cost estimates, inspections, shop drawing reviews, sample recommendations, preparation of operating and maintenance manuals and other related services. In the absence of an Architect, the District assumes the role of the Architect.

1.11 Wherever the word "Architect" appears herein, the intent is the design professional with whom the District has a contractual agreement for the

Project.

1.12 Wherever the phrase “in the form of” or similar appears in the Contract Documents, that phrase shall be taken to permit the use of alternative forms, provided all information required by the referenced form is submitted in a format acceptable, in its sole discretion, to the District. Where the Bidder or Contractor is directed to use a specific form, that form shall be used without exception.

1.13 Acceptable Bidders are cautioned that even though they are named in the specifications, or named as an acceptable Bidder in an addendum, they must comply with the specifications’ requirements and drawings. All Manufacturers are subject to requirements of the specifications and drawings. If, for any reason, the manufacturer can not comply with the requirements, it is not acceptable.

ARTICLE 2 BIDDER'S REPRESENTATIONS

2.1 The Bidder by making a Bid represents that:

2.1.1 The Bidder has read and understands the Bidding Documents and Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

2.1.2 The Bid is made in compliance with the Bidding Documents.

2.1.3 The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents and has accepted full responsibility for any pre-bid existing conditions that would affect the Bid that could have been ascertained by a site visit.

2.1.4 The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.

2.1.5 The workplace will be maintained drug-free in accordance with Title 44, Chapter 107 of the SC Code of Laws.

2.1.6 When a Bidder enters “self-performed” where the Proposal requires a list of Subcontractors to be used on this Project, the Bidder certifies that it is licensed and qualified to perform the respective

trade/craft applicable to the requested subcontractor listing. The Bidder also certifies that his tradesmen/craftsmen for the listed trade/craft are skilled, trained, and qualified in their respective trades/crafts, are already in the Bidder’s employ, and that the Bidder will not “shop” for tradesmen/craftsmen for this specific project. The Bidder shall upon request provide supporting documentation showing successfully completed projects where the Bidder used his own tradesmen/craftsmen, and the average length of employment of the respective tradesmen/craftsmen.

2.1.7 The Bidder understands that the Project is subject to the Procurement Code of School District Five of Anderson County.

.1 With regard to the subcontractors required to be listed in the Bid, the Bidder agrees that a Bid is non-responsive if at the Bid Opening it lists a subcontractor who, at the time of the Bid Opening, is not sufficiently licensed under State law to perform the work for which it is listed as the subcontractor, and that this non-responsiveness is not subject to cure by substitution, as provided in the subcontractor listing requirements of the Procurement Code.

2.2 If a Mandatory Pre-Bid Conference is specified, then:

2.2.1 Prospective Bidders are required to be represented at a Mandatory Pre-Bid Conference, at the specified time, date and place;

2.2.2 Only those prospective Bidders that are represented and are listed on the sign-in sheet will be allowed to submit Bids on the Work;

2.2.3 When it is in the best interest of the District, the District shall have the right to schedule more than one Mandatory Pre-Bid Conference. All prospective Bidders shall be represented and listed on the sign-in sheet of at least one Mandatory Pre-Bid Conference to be eligible to bid the Work.

2.3 If the District has scheduled only one Mandatory Pre-Bid Conference and only one prospective Bidder is represented at the Conference, then either:

2.3.1 The Pre-Bid Conference will be canceled and rescheduled for a later date; or,

2.3.2 An additional Mandatory Pre-Bid Conference will be scheduled at a later date and which must be attended by at least one additional prospective Bidder; or,

2.3.3 A non-mandatory Pre-Bid Conference will be scheduled at a later date; or,

2.3.4 The project will be re-advertised for open bidding under the conditions specified in the new advertisement.

2.4 The Architect will publish, prior to the Bid opening, an Addendum to the Contract Documents listing the Bidders that were represented and signed-in at any Mandatory Pre-Bid Conferences.

2.5 By submitting a Bid, the Bidder agrees that the Anderson School District Five Procurement Code is the sole and exclusive method for the assertion and resolution of any protests or any other claims whatsoever, whether legal or equitable in nature, arising from any aspect of this solicitation, and that the remedies available to a Bidder under the Anderson School District Five Procurement Code for the resolution of such protests and claims are, and must in any forum be deemed, exclusive, adequate, and complete in all matters and with regard to any claims whatsoever arising from the Bidder's participation in this solicitation.

2.6 QUALIFICATION OF BIDDERS:

Any qualified Bidder or sub-Bidder that can show evidence it is financially responsible, can secure a bond, has a record of completing work correctly and on time, has a qualified staff, and is properly equipped, may submit a bid. If any prospective Bidder knows of any reason why there might be a question about his qualifications, he may ask for an opinion before he enters into the cost of preparing a bid.

Each Bidder must be properly licensed under the Federal, State, and municipal laws governing its respective trade.

Before awarding a Contract and pursuant to Article 6 of these Instructions, the District may require the apparent low Bidder to further qualify himself as being a responsible Bidder by furnishing any or all of the following data:

1. A financial statement showing assets and liabilities of the Bidder, current to within 30 days of the bid opening or other financial information satisfactory to the Owner.

2. The name and home address of the Surety proposed and the name and address of the responsible local claim agent.

3. A list of the four most recent projects of a similar scope and nature constructed under the Bidder's present name; list the Contract date, the original date set for completion and the actual final date of acceptance of each; give the present name and address of the Owner and Architect.

4. Give the number of employees on the regular payroll of the Bidder's organization; give the name and an outline of qualifications of the proposed job superintendent and each member of the organization who will supervise various parts of the work; give the name of members of the organization who hold appropriate trade licenses and will be responsible for proper installation and the number of these trade licenses.

5. A list of the equipment which will be used to do the work.

**ARTICLE 3
BIDDING DOCUMENTS**

3.1 COPIES OF BIDDING DOCUMENTS

3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement or Invitation to Bid. One complete set of the bidding documents can be obtained by general contractors by remitting the amount stated in the Invitation for Bids, per copy, to the Architect. Additional sets may be obtained for the cost of printing and mailing, this cost being non-refundable.

3.1.2 Bidding documents may be obtained by potential subcontractors for the cost of printing and mailing.

3.1.3 Bidders and sub-Bidders shall use complete sets of Bidding Documents in preparing Bids or sub-Bids; neither the District nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents. Partial sets of Bidding Documents will not be issued.

3.1.4 The Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

**3.2 INTERPRETATION OR
CORRECTION OF BIDDING DOCUMENTS**

3.2.1 The Bidder and each sub-Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid or sub-Bid is submitted. The Bidder and each sub-Bidder shall examine the site and local conditions, such as, but not limited to, location, accessibility, general character of the site or building and the extent of existing work within or adjacent to the site, and shall incorporate the impact, if any, of such conditions into the Bid submitted.

3.2.2 No oral interpretations in regard to the meaning of Plans and Specifications will be made and no oral instructions will be given prior to the award of the Contract. If any person contemplating submitting a bid for the proposed Contract is in doubt as to the true meaning of any part of these proposed Contract Documents, he may submit to the Architect a written request for an interpretation. The request must be received by the Architect four (4) calendar days or more prior to the date established for the receipt of bid. The person submitting the request will be responsible for its delivery. Any interpretation of such documents will be made only by Addendum duly issued, and a copy of such Addendum will be mailed or faxed or delivered to each prime Bidder receiving a set of documents. The District will not be responsible for any other explanations or interpretations of such documents which anyone presumes to make on behalf of the District before bid opening. It is the responsibility of each prime Bidder to verify for himself that he has received all Addenda before he submits his bid. It is the responsibility of all sub-Bidders and material suppliers to be familiar with and to include in their price all Addenda issued up to the time of bid opening.

3.2.3 Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.

3.3 SUBSTITUTIONS

3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution. Reference in the Bidding Documents to the words "or equal" and "or approved equal" shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition.

3.3.2 No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten (10) days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision, in consultation with the District, of approval or disapproval of a proposed substitution shall be final.

.1 All requests for substitutes shall be submitted on the Request For Substitute form that is bound with the Bidding Requirements in the Project Manual. Only one request for substitution shall be submitted on each form. Verbal requests for a substitute or requests submitted on the incorrect request for substitute form will not extend the submittal deadline established by the Instructions To Bidders. Incomplete forms or forms received after the time established in the Instructions To Bidders will not be considered. Where supporting information is submitted, provide manufacturer's published information for the same standards and in the same units of measurements as those published for the specified product. Submittals not meeting these requirements will not be reviewed.

3.3.3 If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

3.3.4 No substitutions during construction for specified items shall be allowed unless they are specifically approved as provided for by the Contract.

3.4 ADDENDA

3.4.1 Addenda will be transmitted to all who are registered with the issuing office as having received a complete set of Bidding Documents.

3.4.2 Copies of Addenda will be made available

for inspection wherever Bidding Documents are on file for that purpose.

3.4.3 No Addenda will be issued later than the fourth (4th) calendar day prior to the date set for receipt of Bids, except to:

- .1 withdraw the request for Bids, or
- .2 postpone the date for receipt of Bids.
- .3 faxed addenda containing information minor in nature may be issued no later than 48 hours prior to the deadline for receipt of bids.

3.4.4 Each Bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge such receipt in the Bid.

3.4.5 When the date for receipt of Bids is to be postponed and there is insufficient time to issue a written Addendum prior to the original Bid Date, prospective Bidders shall be notified by telephone, fax or other appropriate means with immediate follow up with a written Addendum. This Addendum shall verify the postponement of the original Bid Date and establish a new Bid Date.

3.4.6 Bid Forms wherein the Bidder fails to acknowledge all issued Addenda by number shall be rejected as non-responsive, except for the following:

- .1 The Addendum only gives clarifications or lists attendees at a Mandatory Pre-Bid Conference; or,
- .2 The Bid received clearly indicates that the Bidder received the Addendum, such as where the Addendum added another item to the Invitation for Construction Bids and the Bidder submitted a Bid thereon; or,
- .3 The Addendum clearly would have had no effect or merely a trivial or negligible effect on price, quality, quantity, or delivery, and does not affect the relative standing of the Bidders. Under no circumstances can the Bid Amount be changed or modified.
 - (1) *Trivial Or Negligible Effect* shall be defined as an increase in the Base Bid amount of the apparent low Bidder, not to exceed one percent (1%) of the Base Bid amount. There shall be no percentage limitation if the

Addendum decreases the cost of the Work. The cost of the Addendum shall be determined by the Architect.

(2) *Relative Standing Of The Bidders* shall mean that the order of the Bidders would be the same regardless of the Addendum. If the estimated cost of the Addendum (regardless of the percent of increase) exceeds the difference between the Bids of the apparent low Bidder and the second-low Bidder, then the Bid of the apparent low Bidder shall be rejected as non-responsive.

ARTICLE 4 BIDDING PROCEDURES

4.1 PREPARATION OF BIDS

4.1.1 Bids shall be submitted on the Bid Form included in the Bidding Documents, or on true copies thereof, and signed in ink or other indelible media. One (1) executed copy of this form shall be enclosed as the proposal. The Bidder shall make no stipulations or qualify its Bid in any manner not permitted on the Bid Form.

4.1.1.1 PREPARATION OF BID:

THE BID SUM SHALL BE FOR THE MATERIALS BY MANUFACTURERS NAMED WITHIN THE SPECIFICATION AND COMPLYING WITH THE SPECIFICATIONS, DRAWINGS AND ADDENDA.

REQUESTS FOR SUBSTITUTING OTHER MANUFACTURERS WILL BE CONSIDERED WITHIN, BUT NOT LATER THAN THIRTY (30) CONSECUTIVE CALENDAR DAYS AFTER THE NOTICE TO PROCEED OR SIGNING OF CONTRACT, WHICHEVER IS EARLIER. IF DESIGN CHANGES, SIZE OF AREA OR SPACE, HEIGHT OF STRUCTURES OR ENCLOSURES, WEIGHT CHANGES ETC. ARE REQUIRED DUE TO THE SUBSTITUTION, ALL COSTS ASSOCIATED WITH THE SUBSTITUTION ARE THE RESPONSIBILITY OF THE CONTRACTOR.

Should a conflict be discovered within the Contract Documents, the CONTRACTOR SHALL BE DEEMED TO HAVE ESTIMATED THE HIGHEST QUALITY WAY OF DOING THE WORK, unless he shall have asked for and obtained a decision, in

writing, from the Architect, before entering into this Contract.

4.1.2 All blanks on the bid form shall be legibly executed in a non-erasable medium.

4.1.3 Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

4.1.4 Interlineations, alterations and erasures are disfavored and Bidders will not be consulted to clarify ambiguous markings where such opportunity could, in the District's sole judgment, permit that Bidder any unfair advantage in the solicitations. Wherever such markings are made, they must be initialed by the signer of the Bid.

4.1.5 All requested Alternates must be bid.

.1 Indicate either a dollar amount or the words "zero" or "No Change".

.2 Indicate "ADD TO" or "DEDUCT FROM" for each Alternate.

.3 If alternates are called for on which a Bidder does not choose to bid, it may insert the words "No Bid" in the space provided for the amount to be added; however, this may be the basis for rejection of the entire bid later if the District includes the alternate in the Contract. If the blanks by any alternate are not filled in, it will be considered "No Bid".

.4 Each Bidder should consider how the various allowances will affect other alternate bids.

4.1.6 Each copy of the Bid shall state the full legal name of the Bidder and the nature of the legal form of the Bidder. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder. All signatures must be in ink and the name of the person signing shall also be typed or printed below the signature followed by a title showing the relationship to the bidding organization such as: "Owner" in the case of a sole owner; "Partner" in the case of a partnership; "President", "Vice President", etc., in the case of a corporation; or "Agent" in the case of someone acting as agent or Attorney-In-Fact.

A bid by a person who affixes to his signature the "President", "Agent", etc., without disclosing the name of his organization will be held as an individual bidding.

4.1.7 Unsigned Bids shall be rejected; provided however, that an unsigned Bid shall not be rejected when it is accompanied by a properly prepared Bid Security or by other material indicating the Bidder's intention to be bound by the unsigned document, such as the submission of a Bid guarantee with the Bid or a letter with the Bid signed by the Bidder, referring to and identifying the Bid itself.

4.2 BID SECURITY

4.2.1 Each Bid shall be accompanied by Bid Security in the dollar amount of not less than five percent (5%) of the gross Base Bid in the form of a certified check drawn on a bank or trust company insured by the FDIC, or a U.S. money order payable to Board of Trustees of Anderson County School District Five. In lieu of making the cash deposit, the Bidder may submit with each bid a Bid Bond in the penal sum of five percent (5%) of the gross Base Bid meeting the requirements of ¶ 4.2.2 below.

4.2.2 To be acceptable, a Bid Bond shall:

.1 Be issued by a surety company licensed to do business in South Carolina;

.2 Be issued by a surety company having, at a minimum, a "Best Rating" of "A" as stated in the most current publication of "Best's Key Rating Guide, Property-Casualty";

.3 Be written on the form furnished by the Architect or the AIA bid bond form and attached to the Bid Form.

.4 Be accompanied by a certified and current power of attorney by the attorney-in-fact who executes the bond on the behalf of the surety company; and,

.5 Be enclosed in the bid envelope at the time of Bid Opening, either in paper copy or as a Bid Bond authorization number provided on the Bid Form.

4.2.3 By providing Bid Security, the Bidder pledges to enter into a Contract with the District on the terms stated in the Bidding Documents and will furnish bonds covering the faithful performance of

the Contract and payment of all obligations arising thereunder. The Bidder shall forfeit to the District as liquidated damages the amount of the Bid Security if the Bidder fails to:

- .1 Correct any Bid deficiency as required by the Bidding Documents; or,
- .2 Enter into such Contract; and/or,
- .3 Furnish such bonds.

4.2.4 The District shall have the right to retain the Bid Security of any or all Bidders until such time as one of the three conditions listed below has been met.

.1 The Contract for Construction has been executed and both Labor and Material Payment and Performance Bonds, if required, have been furnished; or,

.2 The specified time has elapsed so that Bids may be withdrawn; or,

.3 The District has rejected all Bids.

4.2.5 Bidders submitting a Bid Security not meeting the required amount, surety rating or financial strength rating shall have one working day from the Bid Opening to cure the deficiency or the Bid shall be considered non-responsive. The Bid Security amount submitted with the Bid must be at least 80% of the required amount to be eligible for correction.

4.3 SUBMISSION OF BIDS

4.3.1 All copies of the Bid, the Bid Security, if any, and all other documents required to be submitted with the Bid should be enclosed in a sealed opaque envelope. The Bid Envelope should be addressed to the party receiving the Bids and shall be identified with the Project name(s), the Bidder's name and address, the Bidder's license number and contractor license number.

4.3.2 Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

4.3.3 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

.1 Bidders attending the Bid Opening

should bring Bids to the place of the Bid Opening. The Bids should be given to the Architect or his designee prior to the time of the Bid Opening.

.2 The use of mailed bids is strongly discouraged, and the District is not responsible for the failure of any carrier to deliver a mailed or couriered Bid on time, for any reason whatsoever. However, if a Bid is sent by mail or special delivery service, it should be labeled "SEALED BID ENCLOSED", and shall be addressed to the designated office as shown in the Invitation for Bids. Delivery of Bids to the above location shall be prior to the time of Bid Opening. Bids not delivered to the above location prior to the time of Bid Opening will be rejected unless the Bid is proven to have been delivered to the proper address on time but was not read at the Bid Opening solely due to having been mislaid or overlooked.

4.3.4 Oral, telephonic, telegraphic, facsimile or other electronically transmitted bids will not be considered.

4.3.5 Any other or special documents requested of the Bidder in these Bidding Documents shall be included in the Bid Envelope. If they are not included with the Bid Envelope, the Bidder shall have twenty-four (24) hours from the time of the Bid Opening to provide these documents or its Bid shall be considered non-responsive.

4.3.6 The official time for receipt of Bids shall be determined by reference to the clock designated by the District. The Architect conducting the Bid Opening shall determine and announce that the deadline has arrived and no further Bids or bid modifications will be accepted. All Bids and bid modifications in the possession of the Architect at the time the announcement is completed shall be considered timely, whether or not the bid envelope has been date/time stamped or otherwise marked by the District or the Architect.

4.4 WITHDRAWAL AND RESUBMISSION OF BID

4.4.1 A Bid may not be withdrawn or canceled by the Bidder for a period of forty-five (45) days following the time and date designated for the receipt of Bids, and each Bidder so agrees by submitting a Bid.

4.4.2 Prior to the time and date designated for receipt of Bids, a Bid submitted may be withdrawn by written or telefacsimile (fax) notice to the party receiving Bids at the place designated for receipt of Bids.

4.4.3 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

4.4.4 Withdrawal and Resubmission of entire Bids shall be the only method used to “modify” a Bid prior to Bid Opening. Bidders may not submit partial modifications and no such submissions will be considered for any purpose.

4.4.5 Bid security, if required, shall be in an amount sufficient for the Bid as resubmitted.

4.4.6 Negligence or error on the part of the Bidder in preparing its Bid confers no right for withdrawal of the Bid after it has been opened.

ARTICLE 5 CONSIDERATION OF BIDS

5.1 COMPLIANCE

5.1.1 To be considered, Bids shall be made in accordance with these Instructions to Bidders. Failure to substantially comply with these bidding requirements shall cause a bid to be rejected.

5.2 OPENING OF BIDS

5.2.1 At the established hour, a call will be made for any bids not yet received, after which it will be announced that no more bids will be accepted. At the time for opening, the order of opening and reading bids will be announced; after which Bids received on time will be opened publicly and read aloud.

.1 Reading of a Bid at the bid opening does not cure any non-responsiveness.

.2 The District reserves the right to take as many days as necessary to perform a due diligence examination of responsiveness and responsibility, prior to issuing a Notice of Intent to Award, if any, for the Work.

.3 The District may elect to receive bids for different packages at different times, yet open all bids for all packages at a single bid

opening.

5.2.2 The location and anticipated date of the posting of the Notice of Intent to Award will be announced.

5.2.3 The District shall send a copy of the Bid Tabulation to all Bidders within ten (10) working days of the Bid Opening.

5.2.4 If the Project is to be awarded, the District shall send a copy of the Notice of Intent to Award to all Bidders after posting. The District will issue a Notice of Intent to Award only after thoroughly examining the responsiveness of apparent low Bids and the responsibility of the apparent low Bidder(s) and listed Subcontractors.

5.2.5 If only one Bid is received, the Bid shall be opened and considered.

5.3 REJECTION OF BIDS

5.3.1 The District shall have the right to reject any or all Bids, reject a Bid not accompanied by a required Bid Security or by other data required by the Bidding Documents, or reject a Bid which is in any way incomplete or irregular.

5.3.2 Bids shall be rejected for any of the following reasons, which include, but are not limited to:

.1 Failure by a Bidder to be represented at a Mandatory Pre-Bid Conference or site visit; or,

.2 Failure to deliver the Bid on time; or,

.3 Failure to comply with Bid Security requirements, except as allowed herein; or,

.4 *[this number intentionally not used]*

.5 Failure to list qualified and properly licensed Subcontractors required by law; or,

.6 Showing any modification(s) or exception(s) qualifying the Bid; or,

.7 Faxing a Bid directly to the District or its representative; or,

.8 Failure to include in the Bid Envelope all items required by the Bidding Documents.

.9 Listing Subcontractors that result in the Bid indicating that any portion of the Project would not be performed in compliance with South Carolina contractor licensure laws or regulations.

5.3.3 Bids shall not be rejected for the following reasons, which include, but are not limited to:

.1 Failure to write "Sealed Bid Enclosed" on the outside of the mailing envelope; or,

.2 Failure to seal the Bid envelope; or,

.3 Listing a modification to the Bid on the outside of the Bid envelope, provided however that such modifications will not be considered; or,

.4 Failure to list any information on the envelope other than that which may be required by law; or,

.5 Providing a fax copy or other reproduction of any or all Bidding Documents in the Bid envelope; or,

.6 Failure to indicate both the written words and the numbers for the Base Bid and/or the Alternates; or,

.7 Disagreement between the Bid's written words and the numbers for the Base Bid and/or Alternates, provided however that such disagreement(s) shall be resolved in favor the amount(s) stated in writing; or,

.8 Failure to indicate "ADD TO" or "DEDUCT FROM" on an Alternate, but only when the adjustment is obvious; or,

.9 Failure to provide an Incremental Price or a Unit Price when requested; or,

.10 Providing additional listings of "Subcontractor Specialty" beyond those listed on the Bid Form; or,

.11 Failure of the Bidder to sign the Bid, provided it is accompanied by a

properly prepared Bid Security, or other information, as required by this Section; or,

.12 Providing a reproduction of a signature on any or all Bidding Documents; or,

.13 Failure of the corporation to include its seal on the Bid; or,

.14 Immaterial variation from the exact requirements of the Bidding Documents.

.15 Immaterial errors or omissions in listing any required subcontractor's licensure type or limitation details where these details are to be written on the Subcontractor Disclosure Form, provided the listed subcontractor is indeed properly licensed as required by these Instructions to Bidders and the South Carolina Contractor Licensure Law.

5.3.4 Bidders shall have one (1) working day from the time of Bid opening to correct the following deficiencies:

.1 Failure to provide five percent (5%) Bid Security when required, provided that the Bidder did furnish Bid Security in the proper form equal to at least eighty (80) percent of that required; and,

.2 Failure to provide a Bid Bond with the proper surety rating and financial strength, provided that the Bidder did furnish Bid Security in the proper form equal to at least eighty (80) percent of that required.

5.4 ACCEPTANCE OF BID

5.4.1 INTENT TO AWARD. It is the intent of the District to award a Contract to the lowest evaluated responsive bid submitted by a responsible Bidder. The District reserves the right to conduct discussions with apparent responsive Bidders for the purpose of clarification to assure full understanding of the requirements of the Invitation for Bid.

5.4.1.1 The District reserve the right to solicit and award bids for various packaging of work and/or projects, and to award that combination of bids for the various packages which is, in the opinion of the District, in the District's best interest.

5.4.2 EVALUATION OF BID ALTERNATES.

The District shall have the right to accept Alternates in any order or combination and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

5.4.3 REJECTION OF BIDS. The District shall have the right to reject all Bids; to reject Unit Prices proposed in a Bid without invalidating other portions of the Bid; to waive informalities or irregularities in a Bid received and to accept that Bid which, in the District's judgment, is in the District's own best interests. Failure by the Bidder to correct any deficiency as requested may cause the Bid to be rejected as non-responsive.

5.4.4 CONTRACT EXECUTION. The District shall not enter into a Contract for the Project before the protest period under the District Procurement Code has run, nor prior to a determination of the apparent successful Bidder's responsibility and the responsiveness of its Bid. If only one bid is received and determined to be both responsive and responsible, award may be made and the Contract executed any time after posting the Notice of Intent to Award.

**ARTICLE 6
CONTRACTOR'S QUALIFICATIONS**

6.1 STANDARDS OF RESPONSIBILITY. A prospective Contractor shall be considered as meeting the District's standards of responsibility when the firm has:

6.1.1 Appropriate financial, material, equipment, facility and personnel resources and expertise, or the ability to obtain them, necessary to indicate its capability to meet all contractual requirements; and,

6.1.2 A satisfactory record of performance; and,

6.1.3 A satisfactory record of integrity; and,

6.1.4 Is qualified legally to contract with the State; and,

6.1.5 Has supplied all necessary information in connection with the inquiry concerning responsibility.

6.2 ADDITIONAL INFORMATION. Each Bidder submitting a Bid shall, upon request, submit all information required by the District to support the District's evaluation of the responsibility of the Bidder.

6.2.1 Each Bidder, by submitting a Bid, agrees to waive any claim it has or may have against the District, the Architect, and their respective employees arising out of or in connection with the administration, evaluation or recommendation of any bid.

6.3 The Bidder will be required to establish to the satisfaction of the Architect and District the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents. Prior to the execution of the Contract, the Architect will notify the Bidder in writing if either the District or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the District or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, (1) withdraw the Bid or (2) submit an acceptable substitute person or entity. The District may accept the adjusted bid or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

6.4 Persons and entities proposed by the Bidder and to whom the District and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the District and Architect.

**ARTICLE 7
PERFORMANCE AND PAYMENT BONDS**

7.1 BOND REQUIREMENTS

The successful Bidder shall be required to furnish acceptable performance and payment bonds in the amount of 100% of the contract sum.

7.2 TIME OF DELIVERY

7.2.1 The apparent successful Bidder shall have a maximum of seven (7) days from the date of the Notice to Proceed, to deliver the Performance and Labor and Material Payment Bonds, Certificate of Insurance and the Contract (signed by Contractor only). Failure to deliver these documents as required shall entitle the District to consider the Bid non-responsive, to declare the Bid Security forfeited, and to cancel the Notice of Intent to Award.

**ARTICLE 8
FORM OF AGREEMENT BETWEEN OWNER
AND CONTRACTOR**

The Agreement for the Work will be the document included in this Project Manual.

**ARTICLE 9
PROJECT INFORMATION**

9.1 PROJECT LOCATION:

Anderson County, South Carolina

9.2 Bids sent by mail or special delivery service (UPS, FedEx, etc.) should be labeled “SEALED BID ENCLOSED”, and shall be addressed to the District as follows (label as appropriate to the specific bid being submitted):

ATTN: *Project Challenge Playhouse Renovations*

**Anderson School District Five
400 Pearman Dairy Road
Anderson, South Carolina 29622**

9.3 The Notice of Intent to Award will be posted at the following location:

**Anderson School District Five Office
400 Pearman Dairy Road
Anderson, South Carolina**

9.4 Contacts:

District Representative Contact Information:

**Mr. Wess Grant
Anderson School District Five
400 Pearman Dairy Road
Anderson, SC 29622**

BID FORM

1. BIDDER IDENTIFICATION

Name of Bidder _____

Telephone _____

BID TO: **(Bids are to be received no later than 2:00 p.m. March 9, 2016.)**

**PROJECT CHALLENGE PLAYHOUSE
NEW STORAGE BUILDING & SITE IMPROVEMENTS**

Board of Trustees of Anderson School District Five
Attention: Mr. Wess Grant
400 Pearman Dairy Road
Anderson, South Carolina 29622

2. BASE BID AGREEMENT

The project will be awarded to the lowest, responsive and responsible Bidder. Bid security must be provided for the gross base bid. The Owner reserves the right to accept or reject any/or all bids, to waive informalities, and to award the Contract to the Bidder whose Bid, in the opinion of the District, best meets the requirements of the Invitation for Bids and the Districts' objective. The undersigned agrees that all Bid pricing will remain good for a period of thirty (30) days after time has been called on the date of opening. The undersigned certifies to the District that it will comply with the South Carolina Illegal Immigration Control Act. The undersigned certifies to the District that it will provide a Drug-Free Workplace, as required by Title 44, Chapter 107 of the South Carolina Code of Laws, as amended. The undersigned further agrees, that having carefully examined the bidding requirements, agreement, conditions of the agreement, drawings, including site development drawings, specifications, and all subsequent Addenda as prepared by the Architect, having visited the site and being familiar with all conditions and requirements of the work, and having accepted the stipulations of the above paragraphs, hereby agrees to furnish all labor, materials, equipment, and services including all allowances to complete the:

A. Project Challenge Playhouse New Storage Building & Site Improvements:

\$ _____ *Includes Sums for all Phases of construction and allowances

3. ADDENDA: Addenda (if any) have been received and examined as follows:

- No.: _____ dated _____
- No.: _____ dated _____
- No.: _____ dated _____
- No.: _____ dated _____

4. DATE FOR COMMENCEMENT AND SUBSTANTIAL COMPLETION:

The Date for Commencement shall be established in the Notice to Proceed. The Notice to Proceed shall be issued to the Contractor in writing upon execution of the Contract for Construction. The Contractor shall not incur any expense until the Contract has been awarded. An award requires that the Contract be signed by both the awarding authority and the Contractor. All work, based on the following schedule, shall be substantially completed (as evidenced by the date on the **Certificate of Substantial Completion**) within the schedules noted below. The completion dates are subject to adjustments for extension of time if allowed and also as provided in the Contract Documents. There are liquidated damages for failure to complete in accordance with stated time.

Planned Construction Schedule:

Notice to Proceed:	April 1, 2016 Pending Board Approval
Substantial/Final Completion:	July 15, 2016
Punch List Completion:	30 days after Substantial Completion

5. ALLOWANCES:

Allowances: Bidder acknowledges including all allowances stated in specification section 012100.
Bidder's Initials _____

6. UNIT PRICES:

Unit Prices: The following unit prices, if accepted in the award of this Contract, shall be used in establishing adjustment of Contract Price for additions to or deductions from work in accordance with applicable requirements specified in the General Conditions. Unit Prices listed shall include all costs, profit and overhead, and no further surcharges are to be added to any unit price item of work that may be ordered done.

<u>ITEM</u>	<u>UNIT</u>	<u>PRICE</u>
Rock Excavation, Trenching	CY	\$ _____
Rock Excavation, Open Areas	CY	\$ _____
Removal of Unsatisfactory Soil & Replacement w/ Satisfactory Soil Material	CY	\$ _____
Excavation Cut and Fill	CY	\$ _____
Respread Topsoil	CY	\$ _____

7. BID GUARANTEE, HOLDING TIME AND ACCEPTANCE:

The undersigned agrees that this bid may not be revoked or withdrawn after the time set for the opening of bids, but shall remain open for acceptance for a period of thirty (30) days following the bid date. The undersigned further agrees to sign a Contract for the work as noted above, if offered within thirty days after receipt of bids, and to furnish surety as specified.

8. BID SECURITY:

Unless otherwise provided in the Bid Documents, the undersigned shall enclose bid security in the amount of not less than five percent (5%) of the BASE BID.

9. PERFORMANCE AND PAYMENT BONDS:

Unless otherwise provided in the bid documents, PERFORMANCE and LABOR AND MATERIAL PAYMENT BONDS, each in the amount equal to one hundred percent (100%) of the contract price for the Base Bid shall be required of the successful bidder if the contract is awarded.

10. SUBSTITUTIONS:

Substitutions will not be made without written approval of the Architect and then only for the reason to improve the quality of the building or to furnish savings in cost to the Owner.

11. LISTING OF SUBCONTRACTORS:

IT IS THE BIDDER'S RESPONSIBILITY TO DETERMINE THAT EVERY SUBCONTRACTOR LISTED HEREUNDER HOLDS ANY NECESSARY LICENSE(S) AT THE TIME OF BID OPENING. THE DISTRICT VERIFIES THIS INFORMATION AS PART OF ITS RESPONSIBILITY AND RESPONSIVENESS DETERMINATIONS PRIOR TO THE ISSUANCE OF ANY NOTICE OF INTENT TO AWARD. THE SC CONTRACTOR LICENSING BOARD PHONE NUMBER IS **803-896-4501** (website is <http://www.llr.state.sc.us/POL/Contractors/>) The Procurement Code of Anderson County School District Five provides:

"Any bidder in response to an invitation for bids shall set forth in his bid the name of only those subcontractors that will perform the work as identified in the invitation for bids. If the bidder determines to use his own employees to perform any portion of work for which he would otherwise be required to list a subcontractor and if the bidder is qualified to perform such work under the terms of the invitation for bids, the bidder shall list himself in the appropriate place in his bid and not subcontract any of that work except with the approval of the District for good cause shown."

10. BID AUTHORIZATION:

Bidder's Full Legal Name: _____

Bidder's Federal Taxpayer Identification Number (FEIN): _____

Bidder's S.C. Contractor's Licensee Number and Classification(s): _____

Bidder's Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____ Fax: _____

By _____, its _____
(Type or Print Name of Individual Signing the Bid) (Title)

X _____
(Signature) (Date)

ANDERSON SCHOOL DISTRICT FIVE

GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1 GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Agreement between District and Contractor (hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include other documents such as bidding requirements (advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or portions of Addenda relating to bidding requirements).

1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Architect and Contractor, (2) between the District and a Subcontractor or Sub-Subcontractor, except as set forth in Paragraph 5.4, (3) between the District and Architect or (4) between any persons or entities other than the District and Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties. The form of the Agreement shall be 'Anderson School District Five, AIA Document A101-1997 with modifications.'"

1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the District or by separate Contractors.

1.1.5 THE DRAWINGS

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

.1 SPECIFICATION TERMS

Generally three manufacturers will be noted, however in certain conditions there will be mentioned the terms:

"Or Approved Equal" and "Equal To" mean products by manufacturers other than those specified in the Project Manual and Addenda which the Contractor may submit for substitution and prove to be equal to those specified in the Project Manual and Addenda and which may be incorporated in the Work after review and concurrence by the Architect and acceptance by the Owner.

"Provide" means furnish and install complete, in place, and ready for use.

"Indicated" and "shown" mean as detailed, scheduled, or called for in the Contract Drawings or manufacturers literature or specifications.

"Latest Edition" means the current printed document issued up to 30 calendar days prior to date of receipt of bids.

"Product" means a specified item, and is taken to include materials, systems, and equipment.

1.1.7 THE PROJECT MANUAL

The Project Manual is a volume assembled for the Work which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications.

1.1.8 DISTRICT

The District is School District Five of Anderson County, South Carolina. The District is the Owner.

1.1.9 NOTICE TO PROCEED

A document issued to the Contractor fixing the date on which the Contract time will commence for the Contractor to begin the prosecution of the Work in accordance with the requirements of the Contract Documents.

1.1.10 KNOWLEDGE

The terms "knowledge," "recognize," and "discovery," their respective derivatives, and similar terms in the Contract Documents, as used in reference to the Contractor, shall be interpreted to mean that which the Contractor knows or should know, recognizes or should recognize, and discovers or should discover, in exercising the care, skill, and diligence required by the Contract Documents. Analogously, the expression "reasonably inferable" and similar terms in the Contract Documents shall be interpreted to mean reasonably inferable by a contractor familiar with the Project and exercising the care, skill, and diligence required of the Contractor by the Contract Documents.

1.1.11 DIVISION OF RESPONSIBILITY

The Architect is responsible for design. The Contractor is responsible for construction and safety. The District is responsible for maintenance after completion and acceptance, not including any repairs that are covered by Warranty and/or Guarantee, as described in Paragraph 3.5.3.

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results. In the event of inconsistencies within or between parts of the Contract Documents or between the Contract Documents and applicable standards, codes, and ordinances, the Contractor shall:

- .1** provide the better quality or greater quantity of Work; or,

.2 comply with the more stringent requirement; either or both in accordance with the Architect's interpretation.

.3 The terms and conditions of this Subparagraph 1.2.1, however, shall not relieve the Contractor of any of the obligations set forth in Subparagraphs 3.2 and 3.7.

1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade. Such separations shall not operate to make the Architect an arbiter to establish limits of Work between Sub-Contractors or between Contractor and Sub-Contractor. Manufacturers listed within each technical Section may be in alphabetical order, and if listed in alphabetical order, this order of listing shall not be interpreted as an order of preference.

1.2.3 Unless otherwise stated in the Contract Documents, words which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

1.2.4 All Work shall conform to Contract Documents. No change therefrom shall be made without a review by the Architect. Where more detailed information is needed, or when an interpretation of the Contract Documents is needed, the Contractor, before proceeding with Work, shall refer the matter to the Architect who will furnish information or interpretation in the form of a Field Order or other written forms or drawings. Where only part of the Work is indicated, similar parts shall be considered as duplication. Where any detail is shown and the components therefore are fully described, similar details shall be construed to require equal materials and construction.

1.3 CAPITALIZATION

1.3.1 Terms capitalized in these General Conditions include those which are (1) specifically defined, (2) the titles of numbered articles and identified references to Paragraphs, Subparagraphs and Clauses in the document or (3) the titles of other documents.

1.4 INTERPRETATION

1.4.1 In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one

statement and appears in another is not intended to affect the interpretation of either statement.

1.5 EXECUTION OF CONTRACT DOCUMENTS

1.5.1 The Architect shall assist the District and Contractor with the execution of the Contract. The Architect shall identify and assist in the correction of any incomplete, missing or unsigned documents upon request of the District.

1.5.2 The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads; (3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including all exploratory work done by the District, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the District.

1.5.3 The District assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the District. Nor does the District assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this Contract, unless that understanding or representation is expressly stated in this Contract.

1.6 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

1.6.1 The Drawings, Specifications and other documents, including those in electronic form, prepared by the Architect and the Architect's consultants are Instruments of Service through which the Work to be executed by the Contractor is described. The Contractor may retain one

record set. Neither the Contractor nor any Subcontractor, Sub-Subcontractor or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications and other documents prepared by the Architect or the Architect's consultants, and unless otherwise indicated the Architect and the Architect's consultants shall be deemed the authors of them and will retain all common law, statutory and other reserved rights, in addition to the copyrights. All copies of Instruments of Service, except the Contractor's record set, shall be returned or suitably accounted for to the Architect, on request, upon completion of the Work. The Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants, and copies thereof furnished to the Contractor, are for use solely with respect to this Project. They are not to be used by the Contractor or any Subcontractor, Sub-Subcontractor or material or equipment supplier on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the District, Architect and the Architect's consultants. The Contractor, Subcontractors, Sub-Subcontractors and material or equipment suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this authorization shall bear the statutory copyright notice, if any, shown on the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' copyrights or other reserved rights. The District shall retain all common law, statutory and other reserved rights, in addition to the limited use copyright, in accordance with the contract between the District and the Architect for this Project.

ARTICLE 2 DISTRICT

2.1 GENERAL

2.1.1 The District shall designate in writing a representative who shall have authority to receive notifications and requests provided for by the Contract, to initiate appropriate responses or actions on the part of the District with respect to all matters requiring the District's approval or authorization, and to communicate the results of such actions on behalf of the District to appropriate other parties as provided for by this Contract. Except as otherwise provided in Subparagraph 4.2.1, the Architect does not have

authority to take actions that bind the District with regard to matters this Contract commits to the control and discretion of the District. The term "District" means the District or the District's designated representative.

2.1.1.1 District's Construction Consultant. The District may retain a construction consultant to advise and assist the District in its role as Owner. The District's construction consultant will be identified to the Contractor at project commencement, and the Contractor shall comply with reasonable project management protocols of the District regarding owner-side organization, division of owner-side administrative responsibilities, general forms and methods of distribution and copying of Project-related communications, and similar matters of Project management and organization.

2.2 INFORMATION AND SERVICES REQUIRED OF THE DISTRICT

2.2.1 *[This number intentionally not used.]*

2.2.2 Except for permits and fees, including those required under Subparagraph 3.7.1, which are the responsibility of the Contractor under the Contract Documents, the District shall secure and pay for necessary approvals, easements, assessments and charges required for development of real estate, use or occupancy of permanent structures or for permanent changes in existing facilities.

2.2.3 The District shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. Subject to the Contractor's obligations, including those in Subparagraphs 1.5.2 and 3.2.1, the Contractor shall be entitled to rely on the accuracy of information furnished by the District pursuant to this Subparagraph, but shall exercise proper precautions relating to the safe performance of the Work.

2.2.4 Information or services required of the District by the Contract Documents shall be furnished by the District with reasonable promptness. Any other information or services relevant to the Contractor's performance of the Work which is within the District's control shall be furnished by the District after receipt from the Contractor of a written request for such information or services. Neither the District nor the Architect shall be required to conduct investigations or to furnish the Contractor with any information concerning subsurface characteristics or other conditions of the areas where the Work is to be performed beyond that which is provided in the Contract Documents. The Contractor shall not be entitled to rely on the accuracy of any information or services provided pursuant to this

Subparagraph.

2.3 DISTRICT'S RIGHT TO STOP THE WORK

2.3.1 If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents as required by Paragraph 12.2 or persistently fails to carry out Work in accordance with the Contract Documents, the District may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the District to stop the Work shall not give rise to a duty on the part of the District to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Subparagraph 6.1.3.

2.4 DISTRICT'S RIGHT TO CARRY OUT THE WORK

2.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents, and fails, within a seven-day period after receipt of written notice from the District, to provide the resources needed to achieve correction of such default or neglect with diligence and promptness, the District may, without prejudice to other remedies the District may have, proceed to correct such deficiencies. In such case an appropriate Change Directive shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including District's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor or its Surety shall pay the difference to the District.

2.4.2 If, after achieving Substantial Completion, the Contractor then defaults, or neglects to complete or fails to provide resources adequate to complete the Project within the adjusted Contract Time for Final Completion as provided for by Subparagraph 9.10.1, the District may carry out the work after giving the Contractor a single seven-day written notice of the Contractor's default or neglect. In such case an appropriate Change Order or Directive shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including District's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor or its Surety shall pay the difference to the District.

2.5 EXTENT OF DISTRICT RIGHTS

2.5.1 The rights stated in this Article 2 and elsewhere in the Contract Documents are cumulative and not in limitation of any rights of the District (i) granted in the Contract Documents, (ii) at law or (iii) in equity.

2.5.2 In no event shall the District have control over, change of, or any responsibility for construction means, methods, techniques, sequences, or procedures for safety precautions and programs in connection with the Work, notwithstanding any of the rights and authority granted the District in the Contract Documents.

ARTICLE 3 CONTRACTOR

3.1 GENERAL

3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Contractor" means the Contractor or the Contractor's authorized representative. Only one Contractor is recognized as a party to the Contract and the term "Contractor" refers to the Contractor who signed the Contract.

When the District executes separate Contracts, the term "Prime Contractor" is used to distinguish these from the Sub-Contractor. The Contractor, as referred to hereinafter, shall be deemed to be either of the several contracting parties called the "Party of First Part" in either of the several contracts in connection with the total project. Where, in special instances hereinafter, a particular Prime Contractor is intended, an adjective precedes the word "Contractor", such as "General", "Heating", etc.

3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents. Approval of the Architect/Engineer to use materials and/or equipment, if granted, will have been in the form of a written addendum and will have been issued to all bidders. Approved substitutions may be used at Contractor's option. No substitutions will be allowed, if substitutions have been requested later than fifteen (10) days prior to bid opening date.

3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons other than the Contractor.

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.1 Since the Contract Documents are complementary, before starting each portion of the Work, the Contractor shall carefully study and compare the various Drawings and other Contract Documents relative to that portion of the Work, as well as the information furnished by the District pursuant to Subparagraph 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, any errors, inconsistencies or omissions discovered by the Contractor shall be reported promptly to the Architect as a request for information in such form as the Architect may require.

.1 The exactness of grades, elevations, dimensions, or locations given on any Drawings issued by the Architect, or the work installed by other contractors, is not guaranteed by the Architect or the District. The Contractor shall verify all existing grades and conditions, and verify dimensions of existing road and entry construction, and existing utility lines, and shall report any errors and inconsistencies in writing to the Architect as called for in Paragraph 3.2.1. The Contractor shall establish all lines and levels required to complete the Work, pay all costs involved, and be responsible for their maintenance and accuracy.

.2 The Contractor shall, therefore, satisfy itself as to the accuracy of all grades, elevations, dimensions, and locations. In all cases of interconnection of its Work with existing or other work, it shall verify at the site all dimensions relating to such existing or other work. Any errors due to the Contractor's failure to so verify all such grades, elevations, dimensions, or locations shall be promptly rectified by the Contractor without any additional cost to the District or any extension of time.

3.2.2 Any inconsistencies, errors or omissions noted by the Contractor during this review shall be reported promptly to the Architect, but it is recognized that the Contractor's review is made in the Contractor's capacity as a Contractor and not as a licensed design professional unless otherwise specifically provided in the Contract Documents. The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations,

but any nonconformity discovered by or made known to the Contractor shall be reported promptly to the Architect. If the Contractor fails to give such notice and, knowingly, proceeds with incorrect work, he shall correct any such errors, inconsistencies, or omissions at no additional cost to the District.

3.2.2.1 Should the Specifications fail to particularly describe the material or kind of goods to be used in any place, then it shall be the duty of the Contractor to make inquiry of the Architect for what is best suited. The material that would normally be used in this place to produce first quality finished Work as well as what would be considered "normal" construction, shall be considered a part of the Contract.

3.2.3 If the Contractor believes that additional cost or time is involved because of clarifications or instructions issued by the Architect in response to the Contractor's notices or requests for information pursuant to Subparagraphs 3.2.1 and 3.2.2, the Contractor shall make Claims as provided in Subparagraphs 4.3.6 and 4.3.7. If the Contractor fails to perform the obligations of Subparagraphs 3.2.1 and 3.2.2, the Contractor shall pay such costs and damages to the District as would have been avoided if the Contractor had performed such obligations. The Contractor shall not be liable to the District or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents or for differences between field measurements or conditions and the Contract Documents unless the Contractor recognized such error, inconsistency, omission or difference and knowingly failed to report it to the Architect.

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the job-site safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the District and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect.

3.3.1.1 Any instructions which the Architect may issue the Contractor shall be adjudged an interpretation of the contract requirements and not an act of supervision.

3.3.2 The Contractor shall be responsible to the District for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for or on behalf of the Contractor or any of its Subcontractors.

3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

3.3.4 In addition to the normal testing and inspection required by the Contractor in the Contract Documents, the District shall hire and pay for an independent testing and inspection service to conduct testing and inspection as specified. The Contractor, in consultation with the appropriate District representative, shall arrange for and schedule all testing at the appropriate time and shall cooperate and coordinate with the independent service. The District's independent testing and inspection service shall not relieve the Contractor of any testing and inspection responsibilities stated in the Construction Documents.

3.3.5 The risk of defective Work is not delegated away from the Contractor by the IBC Chapter 17 special inspection process.

3.4 LABOR AND MATERIALS

3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

.1 The Contractor shall not allow the use of asbestos containing products, whether temporary or permanent and whether or not incorporated or to be incorporated in the work, even if the products are nonfriable and/or contain minimal amounts of asbestos, and even though such products may still be legally installed.

.2 The Contractor shall not allow the use of lead materials in public water applications.

3.4.2 The Contractor may make substitutions only with the consent of the District, after evaluation by the Architect and in accordance with an executed written Change Order.

3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

3.4.4 The Contractor shall only employ or use labor in connection with the Work legally authorized to work, capable of working harmoniously with all trades, crafts, and any other individuals associated with the Project. The Contractor shall also use best efforts to minimize the likelihood of any strike, work stoppage, or other labor disturbance.

.1 If the Work is to be performed by trade unions, the Contractor shall make all necessary arrangements to reconcile, without delay, damage, or cost to the District and without recourse to the Architect or the District, any conflict between the Contract Documents and any agreements or regulations of any kind at any time in force among members or councils that regulate or distinguish the activities that shall not be included in the work of any particular trade.

.2 In case the progress of the Work is affected by any undue delay in furnishing or installing any items or materials or equipment required under the Contract Documents because of such conflict involving any such labor agreement or regulation, the District may require that other material or equipment of equal kind or quality be provided pursuant to a Change Order or Construction Change Directive.

3.4.5 SOUTH CAROLINA ILLEGAL IMMIGRATION REFORM ACT COMPLIANCE AND REPORTING REQUIREMENTS.

All employment related to the Project shall comply with the South Carolina Illegal Immigration Reform Act (S.C. Act No. 280 of 2008) consisting of Title 8, Chapter 14 of the South Carolina Code of Law (the "Act") and its implementing regulations. The Contractor and each subcontractor certifies that it will comply with the requirements of the Act, agrees to execute affidavits of compliance upon request by the District, and agrees to provide to the Owner through the Construction Manager any documentation required to establish either: (a) the applicability of the Act to the contractor, subcontractor, and sub-subcontractor; or (b) the compliance with the

Act by the contractor and any subcontractor or sub-subcontractor. NOTHING IN THE CONTRACT DOCUMENTS EXCUSES THE CONTRACTOR FROM THE CONTRACTOR'S DUTIES AND OBLIGATIONS UNDER APPLICABLE LABOR AND IMMIGRATION LAWS OF THE UNITED STATES.

3.4.6 [This section number is reserved for Owner's criminal records history / sex offender registry background check requirements, to be published by addendum.]

3.5 WARRANTY

3.5.1 The Contractor warrants to the District and the Architect that all materials and equipment furnished under the Contract shall be in first class condition, and new unless otherwise required or permitted by the Contract Documents; that the Work will be free from defects not inherent in the quality required or permitted; and that the Work will conform to the requirements of the Contract Documents. If required by the District or the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. The Contractor further warrants that all workmanship shall be of the highest quality and in accordance with the Contract Documents, and shall be performed by persons well-qualified at their respective trades. Unless caused by the Contractor, the Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not performed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage.

3.5.2 The Contractor agrees to assign to the District at the time of final completion of the Work any and all manufacturer's warranties relating to materials and labor used in the Work and further agrees to perform the Work in such manner as to preserve any and all such manufacturer's warranties.

3.5.3 ALL GUARANTEES SHALL BE SIGNED BY THE MANUFACTURER OR SUBCONTRACTOR AS THE CASE MAY BE AND COUNTERSIGNED BY THE CONTRACTOR. ALL GUARANTEES SHALL BE ADDRESSED TO THE OWNER IN CARE OF THE ARCHITECT.

Except where specifically called for in the Specifications Sections, the warranty and guarantee shall be for 12 months. All guarantees shall become effective on a date established by the Architect. This date generally shall be the date of Final Certificate of Payment, or shall be at Substantial Completion should it become expedient to accept portions of the Work

prior to total completion of the Project.

In the event that the Architect considers it impractical, because of unsuitable test conditions, or some other factors, to execute simultaneous final acceptance of all equipment, portions of the installation may be certified by the Architect for final acceptance when that portion of the system is complete and ready for operation.

The Contractor shall further guarantee for a period of 24 MONTHS that the building shall be water-tight and leak-proof at every point and in every area. This requirement does not include where leaks can be proven to the Architect and the District to be attributed to damage to the building by external forces other than weather or foundation settlement. He shall, immediately upon notification by the Owner of water penetration, determine the source of water penetration and, at his own expense, do any work necessary to make the building water-tight. He shall also, at his expense, repair or replace any other damaged material to return the building to its original accepted condition. A written guarantee including the above paragraph, signed by the Party executing the Contract, shall be submitted to the Owner upon completion of the Project and before Final Certificate of Payment.

In addition the Site Work shall be guaranteed that it meets the Plans and Specifications and complies with all permits and other appropriate regulations for Work of this nature. A written guarantee including the above paragraph, signed by the Party executing the Contract, shall be submitted to the Owner upon completion of the Project and before Final Certificate of Payment.

In addition to the foregoing stipulations, the Contractor shall comply with all other guarantees and warranties referred to in any portions of the Contract Documents, the more stringent requirement governing.

If for any reason the Contractor cannot guarantee any part of his Work using material or construction methods which have been specified, he shall notify the Architect in writing before Contracts are signed, giving reasons, together with the name of product data on substitutions he can guarantee.

Should the Contractor fail to so notify the Architect prior to the signing of Contracts, he will be held to have agreed to guarantee all Work specified or shown.

3.6 TAXES

3.6.1 The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor which are legally enacted when bids are received or negotiations concluded, whether or not yet effective or

merely scheduled to go into effect.

3.6.2 The Contractor's attention is directed to Title 12, Chapter 9, SC Code of Laws, as amended, concerning withholding tax for nonresidents, employees, Contractors and Subcontractors.

3.7 PERMITS, FEES AND NOTICES

3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure, pay for, and, as soon as practicable, furnish the District with copies or certificates of all permits and fees, licenses and inspections necessary for proper execution and completion of the Work which are the Contractor's responsibility under the Contract Documents and applicable codes.. The Contractor is required to obtain, at his own cost, all state and local business licenses and general building and specialty inspection services as required by the Contract Documents to be provided by the Contractor and not by the District as owner. All connection charges, assessments, or inspection fees as may be imposed by any special purpose district, county or municipal agency, or utility company are included in the Contract Sum and shall be the Contractor's responsibility, except those which governing laws, regulations, or codes require the District to provide as owner, which are addressed in Section 13.5 below. Contractor is responsible for contacting local utility companies and governing authorities to ascertain fee requirements.

3.7.2 The Contractor shall comply with and give notices required by laws, regulations and lawful orders and all other requirements of public authorities applicable to performance of the Work. The Contractor shall procure and obtain all bonds required of the District or the Contractor by any special purpose district, county, or municipality in which the Project is located or any other public or private body with jurisdiction over the Project. In connection with such bonds, the Contractor shall prepare all applications, supply all necessary backup material, and furnish the surety with any required personal undertakings. The Contractor shall also obtain and pay all charges for approvals for street closings, parking meter removal, and other similar items as may be necessary or appropriate from time to time for the performance of the Work.

3.7.3 It is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations, unless such laws, statutes, ordinances, building codes, and rules and regulations bear upon the performance of the Work. However, if the Contractor observes that

portions of the Contract Documents are at variance therewith, the Contractor shall promptly notify the Architect and District in writing, and necessary changes shall be accomplished by appropriate Modification.

3.7.4 If the Contractor performs Work knowing it to be contrary to laws, statutes, ordinances, building codes, and rules and regulations without such notice to the Architect and District, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

3.8 ALLOWANCES

3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the District may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection. Cash allowances, when required, are listed in the Division 1 Specifications.

3.8.2 Unless otherwise provided in the Contract Documents:

.1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances;

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect the difference between actual costs under Clause 3.8.2.1 and 3.8.2.2, as documented by invoices, and the allowance amounts.

3.8.3 Materials and equipment under an allowance shall be selected by the District in sufficient time to avoid unreasonable delay in the Work.

3.9 SUPERINTENDENT

3.9.1 Prior to starting Work, the Contractor shall designate the Project Manager, Superintendent, and other key individuals who shall be assigned to the Project through and including Final Completion. The Project Manager and Superintendent shall be approved by the District in its sole discretion. Said representatives shall

be qualified and experienced in the type of Work to be undertaken and shall not be changed during the course of construction without the prior written consent of the District. Should a representative leave the Contractor's employ, the Contractor shall promptly designate a new representative that is acceptable to the District. The District shall have the right at any time to direct a change in the Contractor's representatives if his performance is unsatisfactory. In the event of such demand, the Contractor shall, within seven calendar days after notification thereof, replace said representative with a representative acceptable to the District. The Contractor shall continue to submit representatives until an acceptable representative is approved. The District shall have no obligation to direct or monitor the Contractor's employees.

3.9.2 The Superintendent employed shall have a minimum of five years experience as a superintendent on projects of similar size, scope, and complexity. The District may request verification of this experience.

3.9.3 The Contractor shall not change the Superintendent without the prior written consent of the District, which consent shall not be unreasonably withheld.

3.9.4 The Superintendent shall be in attendance at the Project Site throughout the Work, including completion of the punchlist.

3.9.5 The Superintendent shall be the representative the Contractor, and communications given to the Superintendent shall be as binding as if given to the Contractor.

3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

3.10.1 The Contractor, within three weeks after being awarded the Contract, shall prepare and submit for the District's and Architect's information a Contractor's Construction Schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. This schedule shall:

.1 indicate the dates for the start and completion of the various elements of the Work, and shall be affirmed or revised monthly as required by the conditions of the Work and upon execution of a Change Order that affects time;

.2 provide a graphic representation of activities and events that will occur during performance of the Work in sufficient detail, and as acceptable to the District, to show the sequencing of the various trades for each floor level, wing or work area;

.3 identify each phase of construction and occupancy; and,

.4 set forth dates that are critical in ensuring the timely and orderly completion of the Work in accordance with the requirements of the Contract Documents.

3.10.2 The Contractor shall prepare and keep current, for the Architect's approval, a schedule of submittals which is coordinated with the Contractor's construction schedule and allows the Architect reasonable time to review submittals. A copy of such schedule of submittals must be forwarded to the District.

3.10.3 The Contractor shall perform the Work in accordance with the most recent schedules submitted to and approved by the District.

.1 If the Contractor submits a schedule or schedule progress report indicating, or otherwise expresses an intention to achieve Substantial or Final Completion of the Work or any portion thereof, prior to any completion date required by the Contract Documents or to the expiration of the Contract Time, no liability to the District for any failure of the Contractor to do so complete the Work shall be created or implied. The Contractor shall not be entitled to an adjustment in the Contract Sum or the Contract Time for failure to achieve such early completion dates.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

3.11.1 The Contractor shall maintain at the site for the District one record copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to record field changes and selections made during construction, and one record copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the District upon completion of the Work. Prompt delivery to the Architect of the materials and items specified above, in good order, shall be a condition precedent to the Contractor receiving a Certificate of Substantial Completion.

3.11.2 Contractor shall refer to Division 1 of the Specifications for the requirements pertaining to "Record Documents" (drawings specifications and etc.)

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, training and operations manuals, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

3.12.3 Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review by the Architect is subject to the limitations of Subparagraph 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals which are not required by the Contract Documents may be returned by the Architect without action.

3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the District or of separate Contractors. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect without action.

.1 Sprinkler shop drawings shall be prepared by the licensed sprinkler Contractor. The sprinkler shop drawings shall be reviewed and approved by the Architect's engineer of record before submittal to the State Fire Marshal or other authorities having

jurisdiction.

.2 The Contractor shall submit a copy of the State Fire Marshal's approval letter to the Architect and the District.

3.12.6 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

3.12.8 The Work shall be in accordance with approved submittals, except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice the Architect's approval of a resubmission shall not apply to such revisions.

3.12.10 The Contractor shall not be required to provide professional services which constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents, for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certification by a design professional related to systems, materials or equipment are

specifically required of the Contractor by the Contract Documents, the District and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional and who shall comply with reasonable requirements of the District regarding qualifications and insurance, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The District and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed by such design professionals. Pursuant to this Subparagraph 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

3.12.11 When professional certification of materials, systems or equipment is required by the Contract Documents, the Architect shall be entitled to rely upon the accuracy and completeness of such calculations and certifications.

3.13 USE OF SITE

3.13.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials or equipment. The Architect, Owner and Contractor must agree upon designated space(s) for materials storage before any materials are delivered to the site.

3.13.2 Only materials and equipment that are to be used directly for the Work shall be brought to and stored on the Project site by the Contractor. After equipment is no longer required for the Work, it shall be promptly removed from the Project site. Protection of construction materials and equipment stored at the Project site from weather, theft, damage, and all other adversity is solely the responsibility of the Contractor. The Contractor shall ensure that the Work, at all times, is performed in a manner that affords reasonable access, both vehicular and pedestrian, to the site of the Work and all adjacent areas. The Work shall be performed, to the fullest extent reasonably possible, in such a manner that public areas adjacent to the site of

the Work shall be free from all debris, building materials, and equipment likely to cause hazardous conditions.

3.13.3 The Contractor and any entity for whom the Contractor is responsible shall not erect any sign on the Project site without the prior written consent of the District, which may be withheld in the sole discretion of the District.

3.13.4 Without limitation or any other provision of the Contract Documents, the Contractor shall use best efforts to minimize any interference with the occupancy or beneficial use of (i) any areas and buildings adjacent to the site of the Work and (ii) the Building in the event of partial occupancy, as more specifically described in Paragraph 9.9. Without prior approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project site, including, without limitation, lavatories, toilets, entrances, and parking areas other than those designated by the District.

.1 Without limitation of any other provision of the Contract Documents, the Contractor shall use its best efforts to comply with all rules and regulations promulgated by the District in connection with the use and occupancy of the Project site and the Building, as amended from time to time. The Contractor shall immediately notify the District in writing if during the performance of the Work, the Contractor finds compliance of any portion of such rules and regulations to be impracticable, setting forth the problems of such compliance and suggesting alternative through which the same results intended by such portions of the rules and regulations can be achieved. The District may, in the District's sole discretion, adopt such suggestions, develop new alternatives, or require compliance with the existing requirements of the rules and regulations.

.2 The Contractor shall also comply with all insurance requirements applicable to use and occupancy of the Project site and the Building.

3.13.5 The Contractor shall at all times require every person present at the site for purposes of the Project to exhibit behavior, demeanor, decorum, and language appropriate to the site's public educational purposes. The Contractor must prevent any initiation of contact with students or District staff at the site, unless the contact is in furtherance of necessary work on the Project or for purposes of safety.

3.14 CUTTING AND PATCHING

3.14.1 The Contractor shall be responsible for cutting,

fitting or patching required to complete the Work or to make its parts fit together properly.

3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the District or separate Contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the District or a separate Contractor except with written consent of the District and of such separate Contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the District or a separate Contractor the Contractor's consent to cutting or otherwise altering the Work.

3.15 CLEANING UP

3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work the Contractor shall remove from and about the Project waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials.

.1 The Contractor recognizes that this project is in a urban area, and must be kept clean, neat and orderly in appearance. Clean up shall be accomplished on a regular daily basis and shall leave the project free of construction debris, trash and litter. In addition, vehicles leaving the site are required to be cleaned so as to not leave debris, dirt or other construction related materials on the adjacent access and/or main roads. Should the Architect notify the Contractor that a clean-up is required and the Contractor fails to correct the deficiencies within 24 hours, paragraph 3.15.2 will be invoked.

3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the District may do so and the cost thereof shall be charged against the Contractor.

3.16 ACCESS TO WORK

3.16.1 The Contractor shall provide the District and Architect access to the Work in preparation and progress wherever located.

3.17 ROYALTIES, PATENTS AND COPYRIGHTS

3.17.1 The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or

claims for infringement of copyrights and patent rights and shall hold the District and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the District or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

3.18 INDEMNIFICATION

3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the District, District's construction consultants, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), including loss of use resulting therefrom, but only to the extent caused in whole or in part by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Paragraph 3.18.

3.18.2 In claims against any person or entity indemnified under this Paragraph 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Subparagraph 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

3.18.3 The obligations of the Contractor under this Paragraph 3.18 shall not extend to the liability of the Architect, the Architect's consultants, and agents and employees of any of them arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Architect, the

Architect's consultants, and agents and employees of any of them provided such giving or failure to give is the primary cause of the injury or damage.

3.18.4 The Contractor's indemnity obligations under Paragraph 3.18 shall also specifically include, without limitation, all fines, penalties, damages, liability, costs, expenses (including, without limitation, reasonable attorney's fees), and punitive damages (if any) arising out of, or in connection with, any (i) violation of or failure to comply with any law, statute, ordinance, rule, regulation, code, or requirement of a public authority that bears upon performance of the Work by the Contractor, a Subcontractor, or any person or entity for whom either is responsible, (ii) means, methods, procedures, techniques, or sequences of execution or performance of the Work, and (iii) failure to secure and pay for permits, fees, approvals, licenses, and inspections as required under the Contract Documents, or any violation of any permit or other approval of any public authority applicable to the Work, by the Contractor, a Subcontractor, or any person or entity for whom either is responsible.

3.18.5 The Contractor shall indemnify and hold harmless all of the Idemnitees from and against any costs and expenses (including reasonable attorney's fees) incurred by any of the Idemnitees in enforcing any of the Contractor's defense, indemnity, and hold-harmless obligations under this Contract.

ARTICLE 4 ADMINISTRATION OF THE CONTRACT

4.1 ARCHITECT

4.1.1 The Architect is the person lawfully licensed to practice Architecture or an entity lawfully practicing Architecture identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Architect" means the Architect or the Architect's authorized representative.

4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the District, Contractor and Architect. Consent shall not be unreasonably withheld.

4.1.3 If the employment of the Architect is terminated, the District shall employ a new Architect against whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the former Architect.

4.2 ARCHITECT'S ADMINISTRATION OF THE

CONTRACT

4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents, and will be the District's representative for this purpose (1) during construction, (2) until final payment is due and (3) with the District's concurrence, from time to time during the one year period for correction of Work described in Paragraph 12.2. Notwithstanding these responsibilities, no act or omission by the Architect shall be considered a waiver of any of the District's rights or interests. The Architect will have authority to act on behalf of the District only to the extent expressly provided in the Contract Documents, unless otherwise modified in writing in accordance with other provisions of the Contract.

.1 Any reference in the Contract Documents to the Architect's taking action or rendering a decision within a "reasonable time" is understood to mean no more than fourteen (14) days, unless otherwise specified.

.2 In the Specifications or on the Drawings, where the word "as directed", "as required", "as approved", "as permitted" or words of like effect are used, it is to be understood that directions, requirement, approval or permission of Architect is intended. Similar words "approved", "acceptable", "satisfactory", or words of like import mean approved by, acceptable to or satisfactory to the Architect.

4.2.2 The Architect, as a representative of the District, shall visit the site as necessary to fulfill its obligations to the District for inspection services, if any, and, at a minimum, to assure conformance with the Architect's design as shown in the Contract Documents and to observe the progress and quality of the various components of the Contractor's Work. The Architect shall (1) keep the District informed about the progress and quality of the Work completed, (2) endeavor to guard the District against defects and deficiencies in the Work, and (3) determine if the Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. The Architect will neither have control over or charge of, nor be responsible for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Subparagraph 3.3.1.

4.2.3 The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The

Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

4.2.4 Communications Facilitating Contract Administration.

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the District and Contractor shall communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate Contractors shall be through the District.

4.2.5 Based on the Architect's evaluations of the Work completed and correlated with the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

4.2.6 The Architect will have authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable the Architect will have authority to require inspection or testing of the Work in accordance with Subparagraphs 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

4.2.7 The Architect will review and approve or take other appropriate action upon the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken with such reasonable promptness as to cause no delay in the Work or in the activities of the District, Contractor or separate Contractors while allowing sufficient time in the Architect's professional judgment to permit adequate review; normal review of a proper submittal shall not exceed ten (10) working days from Architect's receipt of the same, unless the submittal pertains to extraordinarily complex elements of the Work, in which case the Architect shall provide a estimated

completion date for the review upon request of any party. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Paragraphs 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Paragraph 7.4.

4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of Final Completion, will receive and forward to the District for the District's review and records written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final Certificate for Payment upon compliance with the requirements of the Contract Documents.

.1 Refer to Division 1 Specifications for a list of warranties and guarantees that are required, also refer to the individual Technical Sections. The construction project shall have a minimum warranty of one year, however certain systems may have a longer warranty. The entire facility shall be guaranteed to be watertight for a period of not less than two (2) years.

4.2.10 If the District and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents, a copy of which will be provided to the District, Contractor, and Project Representative.

4.2.11 The Architect will, in the first instance, interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the District or Contractor. Upon receipt of such request, the Architect shall promptly notify the non-requesting party in writing of the details of such request. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement

is made concerning the time within which interpretations required of the Architect shall be furnished in compliance with this Paragraph 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretations until fourteen (14) days after written request is made for them.

.1 Subject to review pursuant to Paragraphs 4.3, 4.4 and 4.5, as appropriate, the Contractor shall proceed diligently with performance of the Contract in accordance with the Architect's written interpretations or decisions and the District shall continue to make payments in accordance with the Contract Documents.

4.2.12 Interpretations and decisions of the Architect will be consistent with the design as indicated in and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and initial decisions, the Architect will endeavor to secure faithful performance by both District and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions so rendered in good faith. The Architect's interpretations and initial decisions may be, but need not be, accorded any deference in any review conducted under the terms of the Contract or in law. Any such review shall be *de novo*.

4.2.13 The Architect's decisions on matters relating to aesthetic effect in connection with the administration of the Contract will be final if consistent with the intent expressed in the Contract Documents.

4.2.14 In the Specifications or on the Drawings, where the words 'as directed,' 'as required,' 'as approved,' 'as permitted' or words of like effect are used, it is to be understood that direction, requirement, approval or permission of the Architect is intended. Similar words 'approved,' 'acceptable,' 'satisfactory,' or words of like import mean approved by, acceptable to, or satisfactory to the Architect.

4.3 CLAIMS AND DISPUTES

4.3.1 A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes between the District and Contractor arising out of or relating to the Contract. A voucher, invoice, payment application or other routine request for payment that is not in dispute when submitted is not a Claim under this definition. Claims must be initiated by written notice.

The responsibility to substantiate Claims shall rest with the party making the Claim.

4.3.2 Time Limits for Filing Claims. Claims by either party arising prior to the date final payment is due must be initiated within twenty-one (21) days after occurrence of the event giving rise to such Claim or within twenty-one (21) days after the claimant first recognizes the condition giving rise to the Claim, whichever is later, except as stated for adverse weather days in Clause 4.3.7.2; provided, however, that the claimant shall use its best efforts to furnish the Architect and the other party, as expeditiously as possible, with notice of any Claim including, without limitation, those in connection with concealed or unknown conditions, once such claim is recognized, and shall cooperate with the Architect and the party against whom the claim is made in any effort to mitigate the alleged or potential damages, delay, or other adverse consequences arising out of the condition that is the cause of such a Claim. Claims must be initiated by written notice to the Architect and the other party. By failing to give written notice of a Claim within the time required by this Subparagraph, a party expressly waives its claim. Claims may also be reserved in writing within the time limits set forth in this Subparagraph 4.3.2. If a Claim is reserved, the Resolution of Claims and Disputes procedures described in Paragraph 4.4 shall not commence until a written notice from the claimant is received by the Architect. Any notice of Claim or reservation of Claim must clearly identify the alleged cause and the nature of the Claim and include data and information then available to the claimant that will facilitate prompt verification and evaluation of the claim.

4.3.3 Continuing Contract Performance. Pending final resolution of a Claim, including any administrative review allowed under Paragraph 4.5, except as otherwise agreed in writing or as provided in Subparagraph 9.7.1 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the District shall continue to make payments in accordance with the Contract Documents.

4.3.4 Claims for Concealed or Unknown Conditions. If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which existed at the time of bidding and which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the observing party shall be given to the other party as soon as possible before conditions are disturbed and in no event later than forty-eight (48) hours after first observance of the conditions. The Architect will promptly investigate such

conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall so notify the District and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within 21 days after the Architect has given notice of the decision. If the conditions encountered are materially different, the Contract Sum and Contract Time shall be equitably adjusted, but if the District and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall be referred to the Architect for initial determination, subject to further proceedings pursuant to Paragraph 4.4.

.1 Any adjustment, including reasonable overhead and profit, in the Contract Sum, or to the Contract Time made pursuant to this Subparagraph shall be determined in accordance with Paragraphs 7.5 and 4.3.7 of this Contract, respectively.

.2 No adjustment in the Contract Time or Contract Sum shall be permitted, however, in connection with a concealed or unknown condition that does not differ materially from those conditions disclosed or that reasonably should have been disclosed by the Contractor's (i) prior inspections, tests, reviews, and any preconstruction services for the Project, or (ii) inspections, tests, reviews, and preconstruction services that the Contractor had the opportunity to make and should have performed in connection with the Project.

4.3.5 Claims for Additional Cost. If the Contractor wishes to make Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Paragraph 10.6.

.1 Claims for additional compensation for additional work, due to alleged differences between actual existing site conditions and the site conditions shown on the Contract Documents will not be recognized unless accompanied by certified survey data, made prior to the time the original ground was

disturbed, clearly showing that errors exist which would result in handling more material and performing more work than reasonably could be estimated from the drawings.

4.3.6 If the Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from the Architect, (2) an order by the District to stop the Work where the Contractor was not at fault, (3) a written order for a minor change in the Work issued by the Architect, (4) failure of payment by the District, (5) termination of the Contract by the District, (6) District's suspension or (7) other reasonable grounds, Claim shall be filed in accordance with this Paragraph 4.3.

4.3.7 Claims for Additional Time

.1 If the Contractor wishes to make Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include probable effects of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary. Claims for an increase in the Contract Time shall be based on one additional calendar day for each full calendar day that the Contractor is prevented from working.

.2 Weather Days - Completion time will not be extended for normal bad weather. The time for completion as stated in the Contract Documents includes due allowance for bad weather days. Structural steel activities will include bad weather days defined as any day rain falls prior to 3:00 p.m. or days in which excessive wind is present.

For the purpose of this Agreement, the Contractor agrees that normal bad weather will be defined and that he may anticipate to lose calendar days to weather in accordance with the following table:

January - 8 days
February - 6 days
March - 5 days
April - 6 days
May - 4 days
June - 8 days
July - 7 days
August - 6 days
September - 6 days
October - 5 days
November - 5 days
December - 5 days

If the actual total number of accumulated working days lost to adverse weather exceeds the expected total number of lost working days for the same

period (based on the table above), the time for Substantial Completion will be extended by the number of calendar days on the critical path that the actual number of lost working days exceeds the expected number of lost working days. No extension will be made for days of bad weather occurring after the building is enclosed. No changes in the Contract Sum will be authorized because of adjustment of Contract Time due to weather.

All weather-related Claims for an extension in Contract Time shall be submitted with the Pay Application for the month for which the Claim is being submitted.

All weather-related Claims for an extension in Contract Time will be reviewed and approved on an individual basis on the basis of:

- a. Impact of the lost time
- b. Portions of the Work involved
- c. Measures to be taken to make up lost time
- d. Number of days extension being requested
- e. Building trades affected by lost scheduled work days
- f. Dates of scheduled work days lost because of weather
- g. Number of scheduled work days lost because of weather
- h. Weather conditions that caused the loss of each scheduled work day
- i. Supporting documentation of weather conditions that justify the claim

4.3.8 Injury or Damage to Person or Property. If either party to the Contract suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

4.3.9 Quantity Variations. If the quantity of a unit-priced item in this contract is an estimated quantity and the actual quantity of the unit-priced item varies more than fifteen (15) percent above or below the estimated quantity, an adjustment, including overhead and profit, in the Contract Sum shall be made upon demand of either party. The adjustment shall be based upon any increase or decrease in costs due solely to the variation above 115 percent or below 85 percent of the estimated quantity. Any adjustment in the Contract Sum made pursuant to this Subparagraph shall be

determined in accordance with Paragraph 7.5. If the quantity variation is such as to cause an increase in the time necessary for completion, the Contractor may request, in writing, an extension of time, as set forth in Subparagraph 4.3.7. The Architect shall determine the actual quantities of a unit-priced item used by the Contractor.

4.4 RESOLUTION OF CLAIMS AND DISPUTES

4.4.1 Decision of the Architect. Claims, including those alleging an error or omission by the Architect, shall be referred initially to the Architect for decision if the claimant first recognizes the claim prior to the date of final payment. An initial decision by the Architect shall be required as a condition precedent to resolution (pursuant to Paragraph 4.5) of all claims between the Contractor and District arising prior to the date Final Payment is due, unless thirty (30) days shall have passed after the Claim has been referred to the Architect, with no decision by the Architect. The Architect will not decide disputes between the Contractor and persons or entities other than the District.

4.4.2 The Architect will review Claims and within ten days of the receipt of the Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Architect is unable to resolve the Claim if the Architect lacks sufficient information to evaluate the merits of the Claim or if the Architect concludes that, in the Architect's sole discretion, it would be inappropriate for the Architect to resolve the Claim.

4.4.3 In evaluating Claims, the Architect may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Architect in rendering a decision. The Architect may request the District to authorize retention of such persons at the District's expense.

4.4.4 If the Architect requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either provide a response on the requested supporting data, advise the Architect when the response or supporting data will be furnished or advise the Architect that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Architect will either reject or approve the Claim in whole or in part, in accordance with Subparagraph 4.4.5.

4.4.5 The Architect will approve or reject Claims by written decision, which shall state the reasons therefor and which shall notify the parties of any change in the Contract Sum or Contract Time or both. The Architect's initial decision will be delivered to the parties within two weeks of receipt of any response or supporting data requested pursuant to Subparagraph 4.4.4, or within such longer period as may be mutually agreeable to the parties. If the Architect's initial decision is accepted by the parties, the Architect shall prepare a Change Order with appropriate supporting documentation. The approval or rejection of a Claim by the Architect shall be final and binding on the parties but subject to resolution pursuant to Paragraph 4.5. Any review of the Architect's written decision or determination shall be *de novo*.

4.4.6 If the Architect renders its initial decision after proceedings pursuant to Paragraph 4.5 have been initiated, such decision may be entered as evidence, but shall not supersede such proceedings unless the decision is acceptable to all parties concerned.

4.4.7 Upon receipt of a Claim against the Contractor or at any time thereafter, the Architect or the District may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Architect or the District may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

4.5 DISPUTE RESOLUTION

4.5.1 Without limiting Subparagraph 4.5.2, any Claim arising out of or related to the Contract, except Claims relating to aesthetic effect and except those waived as provided for in Subparagraphs 9.10.4 and 9.10.5 shall, after initial decision by the Architect or thirty (30) days after submission of the Claim to the Architect, be subject to resolution pursuant to Subparagraph 4.5.2.

4.5.2 Contractor consents to be governed by the District's Procurement Code's provisions for contract controversy resolution, and agrees that the District's Procurement Code applies to and governs the Agreement. Contractor waives any objection, including but not limited to Federal and State Constitutional objections, it may have now or hereafter to the administrative process required by the District's Procurement Code. To the extent that the District's Procurement Code, by its own terms, does not govern a claim or controversy between the parties, Contractor agrees that any suit, action or proceeding arising out of or relating to the Agreement shall be instituted and maintained only in the Court of Common Pleas in the county in which the Project is located or in the division

of the Federal District Court for the District of South Carolina in which the Project is located. Contractor agrees that any act by the District regarding the Agreement is not a waiver of either the District's sovereign immunity or the District's immunity under the Eleventh Amendment of the United States Constitution. As used in this paragraph, the term "Agreement" means any transaction or agreement arising out of, relating to, or contemplated by the Contract Documents.

.1 The Contractor and the District shall not be obligated to resolve by arbitration any Claim or dispute related to the Contract. Any reference in the Construction Documents or the Contract to arbitration in connection with such Claims or disputes is hereby deemed void.

4.5.3 Any review of any determination, certification or other decision by the Architect shall be de novo.

ARTICLE 5 SUBCONTRACTORS

5.1 DEFINITIONS

5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor.

5.1.2 A Sub-Subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-Subcontractor or an authorized representative of the Sub-Subcontractor.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 As soon as practicable after posting of the "Notice of Intent to Award" of the Contract and unless otherwise stated in the Contract Documents, the Contractor shall furnish in writing to the District the name, trade, South Carolina contractor license information, and subcontract amount for each Subcontractor proposed for each principal portion of the Work and the names of all persons or entities proposed as manufacturers of the products identified in the Specifications (including those who are to furnish materials or equipment fabricated to a special design) and, where applicable, the name of the installing Subcontractor. The Architect will promptly reply to the Contractor in writing stating whether or not the District, after due investigation, has reasonable objection to any such proposed person or entity. Failure

of the District to reply promptly shall constitute notice of no reasonable objection, except in no case does the District waive the requirement that all Work be done in compliance with State law of contractor licensure.

5.2.2 The Contractor shall not contract with a proposed person or entity to whom the District has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

5.2.3 If the District has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the District has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, as determined by the District, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

5.2.4 The Contractor shall not change a Subcontractor, person or entity previously selected if the District makes reasonable objection to such substitute. The Contractor's Request for Substitution must be made to the District in writing, accompanied by supporting information.

5.2.5 The Contractor shall not contract with a person or entity that would result in any portion of the Work being performed in violation of any Contractor licensure law, and the Contractor shall require all Subcontractors to adhere to the same requirement for all sub-Subcontractors. Work performed without proper licensure shall be deemed non-conforming and be subject to replacement or other remediation at the Contractor's expense.

5.3 SUBCONTRACTUAL RELATIONS

5.3.1 By written agreement the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the District and Architect. Each subcontract agreement shall preserve and protect the rights of the District and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that

subcontracting thereof will not prejudice such rights. The Contractor shall require each Subcontractor to enter into similar agreements with Sub-Subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement which may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-Subcontractors.

5.3.2 Without limitation on the generality of the foregoing, each Subcontract agreement and each Sub-subcontract agreement shall be deemed to include, the following:

.1 An agreement that the District is a third-party beneficiary of the Subcontract (or Sub-subcontract), entitled to enforce any rights thereunder for its benefit, and that the District shall have the same rights and remedies against the Subcontractor (or Sub-Subcontractor) as the Contractor (or Subcontractor) has, including but not limited to the right to be compensated for any loss, expense, or damage of any nature whatsoever incurred by the District resulting from any breach of representations and warranties, expressed or implied, if any, arising out of the agreement and any error, omission, or negligence of the Subcontractor (or Sub-Subcontractor) in the performance of any of its obligations under the agreement; and,

.2 A requirement that the Subcontractor (or Sub-Subcontractor) promptly disclose to the Contractor (or Subcontractor) any defect, omission, error, or deficiency in the Contract Documents or in the Work of which it has, or should have, knowledge; and,

.3 The following Paragraphs and/or Subparagraphs as appropriate, of these Conditions of the Contract: 3.2, 3.5.1, 3.18, 4.4, 4.5, 5.3, 5.4, 13.1.1, 13.13, 14.3 and 14.4.

.4 Nothing in this Section 5.3.2 creates any affirmative duties or contractual liabilities to a Subcontractor or Sub-Subcontractor on the part of the District and its consultants, or the Architect and its consultants, including without limitation any duty to exercise any right or duty to the Contractor or a third party for the benefit of any Subcontractor or Sub-Subcontractor.

5.3.3 The Contractor shall assure the District, by affidavit or in such other manner as the District may approve, that all agreements between the Contractor and his Subcontractor incorporate the provisions of Subparagraph 5.3.1 as necessary to preserve and protect the rights of the District and the Architect under the Contract Documents with respect to the work to be performed by Subcontractors so that the subcontracting thereof will not prejudice such rights.

5.3.4 Upon request, the Contractor shall provide to the District copies of all executed or issued subcontracts, purchase orders and other documents related to the Work.

5.3.5 After a Subcontractor begins work on his portion of the Work, that Subcontractor shall maintain an adequate work force to make consistent and uninterrupted progress in his portion of the Work. Subcontractors shall notify the Contractor of all situations that may interrupt, impede, or delay the progress of the Subcontractor's portion of the Work as soon as the Subcontractor is aware of the situation.

5.3.6 Excluding the usual reduction or reassignment of a work force when a Subcontractor's portion of the Work nears completion, a Subcontractor shall not take any measures that will interrupt, impede, or delay the progress of his portion of the Work or the overall Project without notifying the Architect and without written approval from the Contractor. These measures include ceasing or slowing progress of the Work, reducing the assigned work force, or redirecting or reassigning the work force to another project. Failure to provide the following information in requesting approval from the Contractor may result in disapproval of the request:

- .1** Effective Date
- .2** Nature of the request
- .3** Reason for the request
- .4** Impact on the project schedule
- .5** Name of person making the request
- .6** Date of resuming normal operations

5.3.7 If a Subcontractor fails to assign and maintain an adequate work force so as to diligently make consistent and uninterrupted progress in his portion of the Work, or the Subcontractor ceases work, reduces the assigned work force, or redirects or reassigns the work force to another project, then the Contractor shall notify the Subcontractor, in writing, to resume or continue work. If, within seven calendar days from date of notification to resume or continue work, the Subcontractor fails to resume or continue work or to provide the Contractor and the Architect with an acceptable reason for not resuming or continuing work,

then the Contractor may, at his option, reassign the uncompleted portion of the Subcontractor's Work to another Subcontractor that is acceptable to the District and the Architect. All costs associated with the Contractor's reassignment of the Subcontractor's uncompleted Work, including project delays and correcting the Subcontractor's unacceptable work, shall be the responsibility of the original Subcontractor. On reassignment of the original Subcontractor's uncompleted portion of the Work, the original Subcontractor shall promptly invoice the Contractor for all acceptable work completed prior to the reassignment of the uncompleted portion of the Work. If the Contractor chooses not to reassign the uncompleted portion of the Subcontractor's work to another Subcontractor, then the Contractor shall notify the District and the Architect as to what action shall be taken, and the impact, if any, on the Contract.

5.3.8 It is not the responsibility of the District or Architect to settle any differences between the Contractor and its Subcontractors, or between two or more Subcontractors.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

5.4.1 Subject to the prior rights of the surety, if any, obligated under bond relating to the Contract, each subcontract agreement for a portion of the Work is assigned by the Contractor to the District provided that assignment is effective only after termination of the Contract by the District for cause pursuant to Paragraph 14.2 and only for those subcontract agreements which the District accepts by notifying the Subcontractor and Contractor in writing, and provided the affected Subcontractor agrees to perform assigned portions of the Work in accordance with the Contract Documents

5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days after termination of the Contract by the District pursuant to Paragraph 14.2 and the District accepts assignment of such subcontract, the Subcontractor's compensation shall be equitably adjusted for increase in direct costs incurred by such Subcontractor as a result of the suspension. The equitable adjustment shall be limited to direct costs.

5.4.3 Each subcontract shall specifically provide that the District shall only be responsible to the Subcontractor for those obligations of the Contractor that accrue subsequent to the District's exercise of any rights under this conditional assignment.

ARTICLE 6 CONSTRUCTION BY DISTRICT

OR BY SEPARATE CONTRACTORS

6.1 DISTRICT'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

6.1.1 The District reserves the right to perform construction or operations related to the Project with the District's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the District, the Contractor shall make such Claim as provided in Paragraph 4.3.

6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate District-Contractor Agreement.

6.1.3 The District shall provide for coordination of the activities of the District's own forces and of each separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate Contractors and the District in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate Contractors and the District until subsequently revised.

6.2 MUTUAL RESPONSIBILITY

6.2.1 The Contractor shall afford the District and separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents. Each Subcontractor shall maintain the same construction pace as the General Contractor for the Project.

6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the District or a separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that

would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the District's or separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

6.2.3 The District shall be reimbursed by the Contractor for costs incurred by the District which are payable to a separate Contractor because of delays, improperly timed activities or defective construction of the Contractor. The District shall be responsible to the Contractor for costs incurred by the Contractor of delays, improperly timed activities, damage to the Work or defective construction of a separate Contractor.

6.2.4 The Contractor shall promptly remedy damage wrongfully caused by the Contractor to completed or partially completed construction or to property of the District or separate Contractors as provided in Subparagraph 10.2.5.

6.2.5 The District and each separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Paragraph 3.14.

6.3 DISTRICT'S RIGHT TO CLEAN UP

6.3.1 If a dispute arises among the Contractor, separate Contractors and the District as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the District may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

7.1 CHANGES

7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

7.1.2 A Change Order shall be based upon agreement among the District, Contractor and Architect; a Construction Change Directive requires agreement by the District and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise

provided in the Change Order, Construction Change Directive or order for a minor change in the Work. Except as permitted in Paragraph 7.3 and Subparagraph 9.7.2, a change in the Contract Sum or the Contract Time shall be accomplished only by Change Order. Accordingly, no course of conduct or dealings between the parties, nor express or implied acceptance of alterations or additions to the Work, and no claim the District has been unjustly enriched by any alteration of or addition to the Work, whether or not there is, in fact, any unjust enrichment to the Work, shall be the basis of any claim to an increase in any amounts due under the Contract Documents or a change in any time period provided for in the Contract Documents.

7.2 CHANGE ORDERS

7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the District, Contractor and Architect, stating their agreement upon all of the following:

- .1 change in the Work;
- .2 the amount of the adjustment, if any, in the Contract Sum; and
- .3 the extent of the adjustment, if any, in the Contract Time.
- .4 The Contractor shall not proceed with the Work of the Change Order until the Change Order is approved by the District in writing.
- .5 Any adjustment in the Contract Sum made pursuant to this Paragraph 7.2 shall be determined in accordance with Paragraph 7.5 of this Contract.
- .6 All Change Orders shall be submitted on a "Construction Change Order" form with appropriate documentation attached.

7.2.2 *[This number intentionally not used.]*

7.2.3 Agreement on any Change Order shall constitute a final settlement and mutual release by the Contractor and the District for any and all liability under this Contract attributable to such facts or circumstances giving rise to the Change Order, including, but not limited to, all direct and indirect costs associated with such change and any and all adjustments to the Contract Sum and the construction schedule.

7.2.4 A Change Order, when issued, shall be full compensation, or credit, for the extra work included, omitted, or substituted plus the Contractor's fee as determined in subparagraph 7.5. It shall show on its face, the adjustment in time for completion of the project as a result of the change in the work. Each change order shall include all costs directly related to

the Work, including all overhead, miscellaneous expenses, and incidentals. The Contractor shall submit a written and detailed itemized proposal for each Change Order under consideration (Change Proposal Request) within 21 days of receipt of a pricing request. Cost of work shall mean the sum of all costs that can be directly related to the Work and are paid by the Contractor in the proper execution of the approved Change Order. Such costs shall be no higher than the prevailing costs in the locality of the Project. All costs shall be completely and accurately itemized and shall be fully and accurately substantiated by receipts, vouchers, invoices, certified affidavits, etc.

7.3 CONSTRUCTION CHANGE DIRECTIVES

7.3.1 A Construction Change Directive is a written order which directs a change in the Work and states a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both, and which is prepared by the Architect and signed by the Architect, the Contractor, if it agrees with the terms of the Directive, and the District. The District may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

7.3.3 Any adjustment in the Contract Sum, including reasonable overhead and profit made pursuant to Paragraph 7.3 shall be determined in accordance with Paragraph 7.5 of this Contract.

7.3.4 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

7.3.5 A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

7.3.6 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by the Architect as provided in Clause 7.5.1.5, on the basis of reasonable expenditures and savings of those

performing the Work attributable to the change, including allowances for reasonable overhead and profit.

7.3.7 *[This number intentionally not used.]*

7.3.8 Pending final determination of the total cost of a Construction Change Directive to the District, amounts not in dispute for such changes in the Work shall be included in Applications for Payment. For any portion of such cost that remains in dispute, the Architect will make an interim determination for purposes of monthly certification for payment for those costs. That determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a claim in accordance with Article 4.

7.3.9 When the District and Contractor agree with the determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be recorded by preparation and execution of an appropriate Change Order and shall be effective immediately upon such execution.

7.3.10 If the Contractor defaults or neglects to execute a Change Directive, the District may carry out the Work in accordance with Paragraph 2.4 and Article 6.

7.4 MINOR CHANGES IN THE WORK

7.4.1 The Architect will have authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the District and Contractor. The Contractor shall carry out such written orders promptly.

7.5 PRICE ADJUSTMENTS

7.5.1 METHODS OF ADJUSTMENT. Any adjustment in the Contract Sum made pursuant to this Paragraph 7.5 shall be consistent with this Contract and shall be arrived at through whichever one of the following ways is the most valid approximation of the actual cost to the Contractor:

- .1** by agreement on a fixed price adjustment;
- .2** by unit prices specified in the Contract or subsequently agreed upon;
- .3** by the costs attributable to the event or situation covered by the relevant clause, including profit if otherwise allowed, all as specified in the Contract; or subsequently

agreed upon;

.4 in such other manner as the parties may mutually agree;

.5 in the absence of agreement by the parties, through a unilateral initial determination by the Architect of the costs attributable to the event or situation covered by the clause, including profit if otherwise allowed, all as computed by the Architect in accordance with Clause 7.5.3.2, and subject to review under the provisions of Paragraph 4.5 of this Contract.

7.5.2 FINAL AGREEMENT. When any adjustment in the Contract Sum made pursuant to clauses in this Contract becomes final (e.g., by agreement or dispute resolution), the adjustment shall be computed and documented on a "Construction Change Order."

7.5.3 DOCUMENTATION OF COST REASONABLENESS

.1 **CONTRACTOR'S CHANGE ORDER PROPOSAL.** The Contractor shall submit a written proposal for review by the Architect and the District. The proposal shall be submitted to the Architect within the time limits specified in Subparagraph 4.3.2. All costs claimed by the Contractor shall be justifiable compared with prevailing industry standards, as adjusted for local cost conditions. Costs shall be properly itemized and supported by substantiating data sufficient to permit evaluation before commencement of the pertinent performance or as soon thereafter as practicable.

.2 **CONSTRUCTION CHANGE DIRECTIVES.** For a Construction Change Directive wherein the proposed method of compensation is actual costs, and pending the collection and evaluation of actual costs as required by Clause 7.5.1.3, the Contractor shall estimate the value of the changed work. The Contractor shall itemize the estimated cost into building components and shall use the labor, material and equipment unit direct costs as listed in the most current issue of the Construction Cost Data Book most applicable to the nature of the changed work, as published by R.S. Means, with a cost index adjusted for the project locale. The Contractor shall also be permitted to add overhead and profit as shown in Subparagraph 7.5.4. Where the Contractor does not properly itemize the proposed costs as requested, the Architect shall provide the District with the itemization and this amount shall be the initial basis for compensation under Subparagraph 7.3.8. Upon conversion of the Construction Change Directive to a Change

Order, the Architect's cost for providing this itemization shall be deducted from the final adjustment in the Contract Sum as described in Clause 7.3.9.

7.5.4 AGREED OVERHEAD AND PROFIT RATES.

.1 For any adjustment to the Contract Sum for which overhead and profit may be recovered, other than those made pursuant to Subparagraph 4.3.9, the Contractor agrees to charge and accept, as full payment for overhead and profit, the following percentages of costs attributable to the change in the Work. The percentages cited below shall be considered to include all indirect costs including, but not limited to: field and office managers, supervisors and assistants, incidental job burdens, small tools, and general overhead allocations. "Commission" is defined as profit on work performed by others. The allowable percentages are inclusive of all overhead, profit, and commission:

- (1) Fifteen percent (15%) for Work by the Contractor not involving Subcontractors;
- (2) Seven and one-half percent (7.5%) for Work by Subcontractors;
- (3) When both additions and credits are involved in any one change, the adjustment shall be computed on the net increase, if any.

.2 Not more than two levels of overhead, profit, and commission shall be allowed regardless of the number of Subcontractor tiers.

.3 The Contractor or Subcontractor shall not be allowed overhead or commission on the overhead, profit, and/or commission received by its Subcontractors.

.4 Using the percentages stated in Clause 7.5.4.1, any adjustment to the Contract Sum for deleted work shall include any overhead and profit attributable to the cost for the deleted Work.

.5 If the Contractor initiates a Change Order proposal and the District is not obligated to pay for all or any part of the proposal, then the Contractor shall be responsible for any Architect's fees to evaluate and process that

Change Order proposal. Compensation shall be based on the District's contract with the Architect and the rates for Additional Services contained therein, and shall be withheld from the final payment.

.6 Contractors and Subcontractors shall not be allowed overhead, profit, or commission on the cost of overtime premiums for labor.

7.5.5 COST OR PRICING DATA

.1 The Contractor shall submit cost or pricing data for any element of changed work (other than Unit Price Work) and shall certify that, to the best of his knowledge and belief, the cost or pricing data submitted is accurate, complete, and current as of a mutually determined specified date prior to the date of the pricing. This data shall be itemized and supported by substantiating data sufficient to permit evaluation before commencement of the pertinent Work, or as soon thereafter as practicable, and shall be justifiably compared with prevailing industry standards. As requested by the Architect or the District, the Contractor's submittal shall provide an itemized breakdown of all increases and decreases in the Contract for the Contractor and each Subcontractor (at any tier) in at least the following detail: material, equipment and supply quantities and costs; direct labor hours and rates for each trade; the associated FICA, FUTA, SUTA, and Worker's Compensation Insurance; equipment hours and rates, and costs of premiums for bonds and insurance, permit fees and sales, use or similar taxes related to the Work.

.2 Any Change Order or Change Directive for which certification is required shall contain a provision that the price to the District, including profit or fee, shall be adjusted to exclude any significant sums by which the District finds that such price was increased because the cost or pricing data furnished by the Contractor was inaccurate, incomplete or not current as of the date agreed upon between parties. Notwithstanding Subparagraph 9.10.4, such adjustments may be made after final payment.

ARTICLE 8 TIME

8.1 DEFINITIONS

8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of

the Work.

8.1.2 The Date of Commencement of the Work is the date established in the "Notice to Proceed." The date shall not be postponed by the failure to act of the Contractor or of persons or entities for which the Contractor is responsible. The date of beginning and the time for completion as specified in the Contract are ESSENTIAL CONDITIONS of this Contract.

8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Paragraph 9.8.

.1 The work will not be considered for Substantial Completion review until all project Work is per Contract Documents as designed, all governmental inspections and certificates have been made and posted, and all final finish grades per the drawings are in place. In general, the only remaining work shall be minor in nature, such that the Owner could begin occupying the following day and the completion of the work by the Contractor would not materially interfere or hamper the Owner's Contractor's construction. Also for Substantial Completion acceptance, the Contractor shall certify that all remaining work will be completed within thirty (30) consecutive calendar days following the date of Substantial Completion. Incomplete work will be covered by retainage of funds in an amount as determined by the Architect.

8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

8.2 PROGRESS AND COMPLETION

8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

.1 The date for Substantial Completion of the project is set forth in the Agreement.

8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the District in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and District. The date of commencement of the Work shall not be changed by the effective date of such insurance.

8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

8.2.4 Failure by the Contractor to commence actual physical work on the project within seven (7) days from the Date of Commencement, as established in the Notice to Proceed, will entitle the District to consider the Contractor in substantial breach of its obligations under this Contract. In this event, the District may withdraw the Notice to Proceed and terminate the Contract in accordance with the Contract Documents.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act of neglect of the District or Architect, or of an employee of either, or of a separate Contractor employed by the District, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, or by delay authorized by the District pending dispute resolution, or by other causes which the Architect determines may justify delay, then the Contract Time shall be extended by Change Order to the extent such delay will prevent the Contractor from achieving Substantial Completion within the Contract Time and if the performance of the Work is not, was not, or would not have been delayed by any other cause for which the Contractor is not entitled to an extension in the Contract Time under the Contract Documents. The Contractor further acknowledges and agrees that adjustments in the Contract Time will be permitted for a delay only to the extent such delay (i) is not caused, or could not have been anticipated, by the Contractor, (ii) could not be limited or avoided by the Contractor's timely notice to the District of the delay or reasonable likelihood that a delay will occur, and (iii) is of a duration not less than one (1) day.

8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Paragraph 4.3. However, the Contractor shall, within 7 days after the beginning of such delay, notify the Owner and Architect in writing of the cause of the delay. The Architect will then ascertain the facts and extent of the delay and notify the Contractor within 7 days of the Owner's decision in the matter. Notice of delay and requests for extension of time shall set forth the cause, and number of additional working days the contractor desires the contract to be extended.

8.3.3 Notwithstanding anything to the contrary in the Contract Documents, an extension in the Contract Time, to the extent permitted by Paragraph 8.3.1, shall be the sole remedy of the Contractor for any (i) delay in the

commencement, prosecution, or completion of the Work, (ii) hindrance or obstruction in the performance of the Work, (iii) loss of productivity, or (iv) similar claims (collectively referred to in this Subparagraph 8.3.3. as "Delays") whether or not such Delays are foreseeable, unless a Delay is caused by acts of the District constituting active interference with the Contractor's performance of the Work, and only to the extent such acts continue after the Contract furnishes the District with notice of such interference. In no event shall the Contractor be entitled to any compensation or recovery of any damages, in connection with any Delay, including, without limitation, consequential damages, lost opportunity costs, impact damages, or other similar remuneration. The District's exercise of any of its rights or remedies under the Contract Documents (including, without limitation, ordering changes in the Work, or directing suspension, rescheduling, or correction of the Work), regardless of the extent or frequency of the District's exercise of such rights and remedies, shall not be construed as active interference with the Contractor's performance of the Work.

8.3.4 *[this number intentionally not used]*

8.3.5 *[this number intentionally not used]*

8.3.6 No claims for extension of time will be considered when based on delays caused by conditions existing at the time bids were received and of which the Contractor might be reasonably expected to have full knowledge at the time of bidding, or upon delays caused by failure on the part of the Contractor to anticipate properly the requirements of the work contracted for as to materials, labor and equipment. All claims for extension of time shall be made in writing to the Architect with the next application for payment; otherwise they shall be waived.

8.3.7 Completion date stipulated under other sections of the Contract Documents may be extended by Change Order to compensate for additional work that may be ordered by Owner, provided such work is over and beyond the scope of work covered by the original contract, and is of such nature as to materially affect date of completion.

ARTICLE 9 PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the District to the Contractor for performance of the Work under the Contract Documents.

9.2 SCHEDULE OF VALUES

9.2.1 Upon full execution of the Agreement, the Contractor shall submit to the Architect a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

9.2.2 As requested by the Architect, the Contractor and each Subcontractor shall prepare a trade payment breakdown for the Work for which each is responsible, such breakdown being submitted on a uniform standardized format approved by the Architect and District. The breakdown shall be divided in detail sufficient to exhibit areas, floors, and/or sections of the Work, and/or by convenient units and shall be updated as required by either the District or the Architect as necessary to reflect:

- .1 the description of Work (listing labor and material separately);
- .2 the total value;
- .3 the percent and value of the Work completed to date;
- .4 the percent and value of previous amounts billed;
- .5 the current percent completed and amount billed.

Any schedule of values or trade breakdown that fails to include sufficient detail, is unbalanced, or exhibits "front-loading" of the value of the Work shall be rejected. If either the schedule of values or trade breakdown had been initially approved and subsequently used but later was found improper for any reason, sufficient funds shall be withheld from future Applications for Payment to ensure an adequate reserve (exclusive of normal retainage) to complete the Work.

9.2.3 W/MBE Tracking. As a separate appendix to the Schedule of Values, the Contractor shall maintain, update, track and report the following: (1) basis of recognition as socially disadvantaged (Black American, Hispanic American, Native American, Asian Pacific American, Women, or other designated basis), (2) contract values, (3) contract balances, and (4) payments made to each entity which the South Carolina Office of Small & Minority Business Assistance (OSMBA) has certified as a "socially and economically disadvantaged small business" under SC Code of Regs § 19-445.2160 if the certified business is engaged on the Project at any tier. Records pertaining to solicitation and utilization of these firms are subject to the requirements of document

retention, inspection and audit by the Owner in the same manner as negotiated cost and pricing data, as provided in § 13.12. The Owner may designate the specific format of the appendix to the Schedule of Values.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 As required by the Agreement, the Contractor shall submit to the Architect an itemized Application for Payment for operations completed in accordance with the schedule of values. Such application shall be notarized and supported by such data substantiating the Contractor's right to payment as the District or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and reflecting retainage if provided for in the Contract Documents. The Contractor's Application for Payment shall be in a form acceptable to the District. The Architect will authorize, as provided in Paragraph 9.4 and until the final pay request, monthly payments equal to 96.5% of the portion of the Contract Sum properly allocable to labor, material and equipment incorporated in the Work, and allocable to material and equipment suitably stored.

.1 As provided in Subparagraph 7.3.8, such applications may include requests for payment on account of changes in the Work which have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

.2 Such applications may not include requests for portions of the Work for which the Contractor does not intend to pay to a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

.3 After the Architect certifies Substantial Completion, with the approval of the District, the architect may authorize and the District may make the remaining partial payments to be paid in full, if the Contractor is performing the work and is adhering to the construction schedule.

.4 The Contractor shall include in the letter transmitting the **Application and Certificate for Final Payment** the following statement: "We certify that the Surety for this Project has been duly notified of the amount of this request. Unless exception to pay is made by the Surety to the Architect within 4 calendar days following the date of request, it will be

assumed that the Surety concurs in the payment of this application.”

9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the District, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the District to establish the District's title to such materials and equipment or otherwise protect the District's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site. Rental equipment such as, but not limited to, mobile equipment, pans, forms, scaffolding, compressors, etc., shall not be considered material stored. The Contractor shall also comply with the following specific requirements:

- .1** Title to such materials shall be vested in the District, as evidenced by documentation satisfactory in form and substance to the District, including, without limitation, recording financing statements, UCC filings, and UCC searches.
- .2** With each Application for Payment, the Contractor shall submit to the District a written list identifying each location where materials are stored off the Project site and the value of materials at such location. The Contractor shall procure insurance satisfactory to the District for materials stored on the Project site in an amount not less than the total value thereof, and provide a Certificate of Insurance for the same.
- .3** The consent of any surety shall be obtained to the extent required prior to payment for any materials stored off the Project site.
- .4** Representatives of the District shall have the right to make inspection of the storage areas at any time.
- .5** Such materials shall be (i) protected from diversion, destruction, theft, and damages to the satisfaction of the District, (ii) specifically marked for use on the Project, and (iii) segregated from other materials at the storage facility.

9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the

District no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the District shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

9.4 CERTIFICATES FOR PAYMENT

9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the District a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and District in writing of the Architect's reasons for withholding certification in whole or in part as provided in Subparagraph 9.5.1.

9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the District, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that the Work has progressed to the point indicated and that, to the best of the Architect's knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the District to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

9.5 DECISIONS TO WITHHOLD CERTIFICATION

9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the District, if in the Architect's opinion the representations to the District required by Subparagraph 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and District as provided in Subparagraph 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the District. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence or subsequent observations, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the District from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Subparagraph 3.3.2, because of:

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the District is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the District or another Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 persistent failure to carry out the Work in accordance with the Contract Documents.

9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

9.6 PROGRESS PAYMENTS

9.6.1 After the Architect has issued a Certificate for Payment, the District shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

9.6.2 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the District, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-Subcontractors in a similar manner. Contractor shall properly disburse money received from all payments to all laborers, Subcontractors or materialmen in accordance with State law.

9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and District on account of portions of the Work done by such Subcontractor.

9.6.4 Neither the District nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor except as may otherwise be required by law.

9.6.5 Payment to material suppliers shall be treated in a manner similar to that provided in Subparagraphs 9.6.2, 9.6.3 and 9.6.4.

9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the District shall not constitute acceptance of Work not in accordance with the Contract Documents.

9.7 FAILURE OF PAYMENT

9.7.1 If (a) the Architect does not issue a Certificate for Payment to the District, through no fault of the Contractor, within seven (7) days after receipt of the Contractor's Application for Payment, or (b) the District does not pay the Contractor within seven (7) days after the date established in the Contract Documents, the amount of the Contractor's Application for Payment certified by the Architect, or (c) the District does not pay the Contractor the amount awarded by a dispute resolution order within the time limit established by such order, or within seven (7) days if no time limit is stated in such order, then the Contractor may, upon seven (7) additional days' written notice to the District and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of

shutdown, delay and startup, which shall be accomplished as provided in Paragraph 7.5. As used in this Subparagraph, the phrase "dispute resolution order" includes any decision rendered pursuant to Paragraph 4.4.

9.7.2 If the District is entitled to reimbursement or payment from the Contractor under or pursuant to the Contract Documents, such payment shall be made promptly upon demand by the District. Notwithstanding anything contained in the Contract Documents to the contrary, if the Contractor fails to promptly make any payment due to the District, or if the District incurs any costs and expenses to cure any default of the Contractor or to correct defective Work, the District shall have an absolute right to offset such amounts against the Contract Sum and may, in the District's sole discretion, elect either to (i) deduct an amount equal to that which the District is entitled from any payment then or thereafter due to the Contractor from the District, or (ii) issue a written notice to the Contractor reducing the Contract Sum by an amount equal to that which the District is entitled.

9.8 SUBSTANTIAL COMPLETION

9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the District can occupy or utilize the Work for its intended use; provided, however, that as a condition precedent to Substantial Completion, the District has received all certificates of occupancy and any other permits, approvals, licenses, and other documents from any government authority having jurisdiction thereof necessary for the beneficial occupancy of the Project.

9.8.2 When the Contractor considers that the Work, or a portion thereof which the District agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

.1 The Contractor's list shall be in writing and attached to the "Certificate of Full or Partial Substantial Completion by the Contractor" and submitted at least ten (10) days in advance of the proposed date of inspection and shall be forwarded through the Architect, who will attach its written endorsement as to whether or not it concurs with the Contractor's statement that the Work will be ready for inspection and testing on the date given. The Architect's

endorsement is a convenience to the District only and shall not relieve the Contractor of its responsibility in the matter, nor shall the Architect's endorsement be deemed to be evidence that the Work was substantially complete and ready for inspection and testing. In the event that the Architect does not concur with the Contractor's statement, the Architect shall inform the Contractor of the basis for the Architect's non-concurrence. The Contractor may then, at its sole option, (1) defer the inspection; or, (2) request the inspection be performed in accordance with Subparagraph 9.8.3.

.2 When the Contractor is ready for substantial completion inspection, he shall give notice to the Architect with a copy to the District in the following words:

"The Work on the contract for (show name of improvement or project as it appears in the Form of Agreement), having been substantially completed, except as stipulated herein below, it is requested that a substantial completion inspection be made promptly by the Architect. The following work is incomplete through no fault or negligence of the Contractor: (List any work the Contractor regards as exceptionable and after each item substantiate why its incompleteness is not due to his fault or negligence)."

The Work cannot be considered substantially complete, and no substantial completion inspection shall be conducted, until such time as the Architect, the District have received a letter in the form indicated above.

9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the requirements of the Contract Documents so that the District can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

.1 Inspection and testing shall take place at a

time(s) mutually agreeable to the Contractor, District, and Architect.

.2 The inspection shall include a demonstration by the Contractor that all equipment, systems and operable components of the Work function properly and in accordance with the Contract Documents. The Contractor shall furnish access for the inspection and testing as provided in this Contract. The inspection and testing shall determine whether Substantial Completion has been accomplished and shall result in the Architect's issuance of a written list of Unfinished Work and Defective Work, referred to as a "punch list", each item of which must be finished and corrected prior to Final Completion.

.3 The Architect and its Consultants shall conduct all Substantial Completion inspections. The District may elect to have other persons of its choosing also participate in the inspections. Representatives of the State Fire Marshal's Office, the State Board of Education, and any other authorities having jurisdiction may be present, at their sole discretion, at the Substantial Completion inspection or otherwise inspect the completed Work and advise the District whether the Work meets their respective requirements.

.4 If the inspection discloses any item which is not in accordance with the requirements of the Contract Documents and will prevent the District from occupying or utilizing the Work for its intended use, the Contractor shall complete or correct such item upon notification by the Architect. The Contractor shall then submit a request for a follow-up inspection by the Architect to determine Substantial Completion.

.5 The Contractor shall proceed promptly and diligently to complete and correct items on the list of Unfinished or Defective Work. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

.6 If more than one Substantial Completion inspection is required, the Contractor shall reimburse the District for all costs of reinspection or, at the District's option, the costs may be deducted from payments due to the Contractor.

9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Partial or Substantial Completion by the Architect which shall establish the date of Substantial Completion, shall establish responsibilities of the District and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Partial or Substantial Completion by the Architect.

9.8.5 The Certificate of Partial or Substantial Completion by the Architect shall be submitted to the District and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the District shall make payment of retainage applying to such Work or designated portion thereof.

.1 Upon such acceptance of Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and certification by the Architect, the District shall make payment for such Work or portion thereof as provided in the Contract Documents. The balance payable shall include the retainage of three and one-half (3.5) percent of the Contract Sum, less any retainage released under conditions of Subparagraph 9.6.2, plus an amount equal to the cost to complete or to correct, as determined by the Architect, of the Uncompleted or Defective Work, plus the amount of Liquidated Damages, if any. Retainage shall continue until Final Completion and Final Payment, except as released by the Architect and the District pursuant to Subparagraph 9.3.1.3.

9.9 PARTIAL OCCUPANCY OR USE

9.9.1 The District may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to and authorized by public authorities having jurisdiction over the Work. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the District and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in

writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Subparagraph 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the District and Contractor or, if no agreement is reached, by decision of the Architect.

9.9.2 Immediately prior to such partial occupancy or use, the District, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

9.10 FINAL COMPLETION AND FINAL PAYMENT

9.10.1 Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Subparagraph 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

.1 Final Completion shall be achieved according to the Project schedule. Failure of the Contractor to achieve Final Completion within the time allowed under this Subparagraph shall entitle to District to consider the Contractor in substantial breach of its obligations under this Contract.

.2 The Contractor shall notify the District, in writing on a "Certificate of Completion by the Contractor", of the date when the Work has reached or will reach Final Completion and will

be ready for final inspection and testing. The notice shall be given at least ten (10) days in advance of said date and shall be forwarded through the Architect, who will attach its endorsement as to whether or not it concurs in the Contractor's statement that the Work will be ready for inspection and testing on the date stated. The Architect's endorsement is a convenience to the District only and shall not relieve the Contractor of its responsibility in the matter, nor shall the Architect's endorsement be deemed to be evidence that the Work was finally complete and ready for inspection and testing. In the event that the Architect does not concur with the Contractor's statement, the Architect shall inform the Contractor of the basis for the Architect's non-concurrence. The Contractor may then, at its sole option, (1) defer the inspection; or, (2) request the inspection be performed in accordance with this Subparagraph. The final inspection and testing shall be conducted in the same manner as the inspection for Substantial Completion, including, but not limited to, the requirements of Clauses 9.8.3.3, 9.8.3.4, 9.8.3.5 and 9.8.3.6 of this Contract.

.3 Representatives of the State Fire Marshal's Office, the State Board of Education, and other authorities having jurisdiction may be present at the Final Completion inspection or otherwise inspect the completed Work and advise the District whether the Work meets their respective requirements for the Project.

.4 The Contractor shall then submit a request for a follow-up inspection to determine Final Completion. **If more than one Final Completion inspection is required, the Contractor shall reimburse the District for all costs of reinspection or, at the District's option, the costs may be deducted from payments otherwise due to the Contractor.**

.5 Approval of Work at or as a result of any inspection required herein shall not release the Contractor or its surety from responsibility for complying with the Contract.

9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the District or the District's property might be responsible

or encumbered (less amounts withheld by District) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the District, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the District, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the District. If a Subcontractor refuses to furnish a release or waiver required by the District, the Contractor may furnish a bond satisfactory to the District to indemnify the District against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the District all money that the District may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

.1 All warranties and guarantees required under or pursuant to the Contract Documents shall be assembled and delivered by the Contractor to the Architect as part of the final Application for Payment. The final Certificate of Payment will not be issued by the Architect until all warranties and guarantees have been received and accepted by the District.

9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the District shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

9.10.4 The making of final payment shall constitute a waiver of Claims by the District except those arising from:

.1 liens, Claims, security interests or

encumbrances arising out of the Contract and unsettled;

.2 failure of the Work to comply with the requirements of the Contract Documents;

.3 terms of special warranties required by the Contract Documents; or

.4 faulty or defective Work discovered after the date of Substantial Completion.

9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those specific claims in stated amounts that have been previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract. The Contractor, Sub-Contractor, and each Prime Contractor, as the case may be, shall comply with the Rules and Regulations Governing the Construction Industry as promulgated for the Health, Safety and General Welfare of Employees under General Statutes of South Carolina. These safety precautions shall include protection for the blind, deaf, mute, and physically handicapped persons; particular attention being given to open pits, trenches, and shafts, low headroom, material storage areas, debris, and obstruction to traffic. Maintain from the beginning of twilight, through the whole of every night, sufficient light and guards to protect persons from injury.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to:

.1 employees on the Work and other persons who may be affected thereby;

.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-Subcontractors; and

.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks,

pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

.4 The Contractor expressly undertakes to take the above stated precautions and provide the above stated protection at his own expense.

10.2.2 The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

.1 The Contract Documents and the joint and several phases of construction hereby contemplated are to be governed at all times, by applicable provisions of the Federal Law (s) including, but not limited to, the latest amendments of the following:

- 1) Williams-Steiger Occupational Safety Act of 1970, Public Law 91-596;
- 2) Part 1910 - Occupational Safety and Health Standards, Chapter XVII of Title 29, Code of Federal Regulations; and
- 3) Part 1518 - Safety and Health Regulations for Construction, Chapter XIII of 29, Code of Federal Regulations.

10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying District and users of adjacent sites and utilities.

10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Clauses 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-Subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Clauses 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the District or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor.

The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Paragraph 3.18.

10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the District and Architect.

10.2.7 The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.

10.2.8 When all or a portion of the Work is suspended for any reason, the Contractor shall securely fasten down all coverings and protect the Work, as necessary, from injury by any cause.

10.2.9 The Contractor shall promptly report in writing to the District, the Architect, and the appropriate authorities, all accidents arising out of or in connection with the Work that cause death, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the District and the Architect.

10.3 HAZARDOUS MATERIALS

10.3.1 If reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons, or serious losses to real or personal property resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the District and Architect in writing.

.1 The District and Contractor hereby agree that this Paragraph shall apply only to hazardous, toxic or radioactive materials or substances subject to the regulations of agencies having jurisdiction, such as, but not limited to, the S.C. Department of Health and Environmental Control (SCDHEC), the U. S. Environmental Protection District (USEPA) and the U.S. Nuclear Regulatory Commission (USNRC).

10.3.2 The District shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to

be present, to verify that it has been rendered harmless. Unless otherwise required by the Contract Documents, the District shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the District in writing stating whether or not either has reasonable objection to the persons or entities proposed by the District. If either the Contractor or Architect has an objection to a person or entity proposed by the District, the District shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the District and Contractor. The Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shutdown, delay and startup, which adjustments shall be accomplished as provided in Article 7.

.1 Any adjustment in the Contract Sum, including reasonable overhead and profit, made pursuant to this Subparagraph shall be determined in accordance with Paragraph 7.5 of this Contract.

.2 The Work in the affected area shall be resumed immediately following the occurrence of any of the following events: (a) the District causes remedial work to be performed that results in the absence of materials or substances; or (b) the District and the Contractor, by written agreement, decide to resume performance of the Work; or (c) the Work may safely and lawfully proceed, as determined by an appropriate governmental authority or as evidenced by a written report to both the District and the Contractor, which is prepared by an environmental engineer reasonably satisfactory to both the District and the Contractor.

.3 For the purposes of this Contract, the term "rendered harmless" shall be interpreted to mean that measured levels of verified hazardous, toxic or radioactive materials or substances are less than the applicable standards established by authorities having jurisdiction. In no event, however, shall the District have any responsibility for any substance or material that is brought to the Project site by the Contractor, any Subcontractor, any material supplier, or any entity for whom any of them is responsible, unless such materials or substances were expressly required by the Contract Documents.

The Contractor agrees not to use any fill or other materials to be incorporated into the Work that are hazardous, toxic, or radioactive, or made up of any items that are hazardous, toxic, or radioactive.

10.4 The District shall not be responsible under Paragraph 10.3 for materials and substances brought to the site by the Contractor unless such materials or substances were required by the Contract Documents.

10.5 If, without negligence on the part of the Contractor, the Contractor is held liable for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the District shall indemnify the Contractor for all cost and expense thereby incurred.

10.6 EMERGENCIES

10.6.1 In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Paragraph 4.3 and Article 7. Written notice of the emergency, including an estimate of cost and probable effect of delay on the progress of the Work, must be given by the Contractor to the Architect as soon as possible, but in no case more than ten (10) days after the start of the emergency.

ARTICLE 11 INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

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

.1 claims under workers' compensation, disability benefit and other similar employee benefit acts which are applicable to the Work to be performed;

.2 claims for damages because of bodily injury, occupational sickness or disease, or

death of the Contractor's employees;

.3 claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

.4 claims for damages insured by usual personal injury liability coverage;

.5 claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

.6 claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;

.7 claims for bodily injury or property damage arising out of completed operations, which coverage shall be maintained for no less than two (2) years following final payment; and

.8 claims involving contractual liability insurance applicable to the Contractor's obligations under Paragraph 3.18.

11.1.2 Without limitation on the general requirements of Paragraph 11.1.1, the Contractor specifically shall maintain the following insurance for the project as part of its compliance with Paragraph 11.1.1:

A. Workmen's Compensation - Statutory - and Employers' Liability Insurance that complies with the laws of the state in which the work is located shall be carried on all employees engaged in any and all phases of the work required under this contract.

Minimum Limits:

Workmen's Compensation - Statutory

Employer's Liability:
\$500,000 Each Accident

By Disease:
\$500,000 Each Employee
\$500,000 Policy Limit

B. General Liability (Bodily Injury and Property Damage Liability) including completed operations coverage, products liability coverage, Broad Form Property Damage and Blanket Contractual Liability Coverage. To cover all

phases of the operations required under this contract. Occurrence Form.

Minimum Limits:

General Aggregate:
\$2,000,000.00

Products-Completed Operations Aggregate:
\$2,000,000.00

Personal & Advertising Injury:
\$1,000,000.00

Each Occurrence:
\$1,000,000.00

C. Owner's & Contractor's Protective Bodily Injury and Property Damage Liability Insurance must be provided by the contractor for the benefit of the District covering the entire operation involved in the contract. The minimum limits of liability required for such insurance are as follows:

.1 Same Limits as General Liability Coverage.

.2 Extend policy to include interest of Architects.

D. Automobile Bodily Injury and Property Damage Liability Insurance shall be carried on all automobiles, trucks and similar vehicles that will be used in any phase of the work required under this contract. The minimum limits of liability required for such insurance are as follows:

\$1,000,000.00 Combined Single Limit per occurrence for Bodily Injury and Property Damage.

E. Excess Umbrella Liability (Occurrence Form)

Minimum Limit:
\$2,000,000.00 Each Occurrence,
\$2,000,000.00 Aggregate

F. Builder's "All Risk, Including Theft and Earthquake" Insurance in an amount equal to the full amount of the contract, shall be provided by the District.

11.1.3 Certificates of insurance acceptable to the District shall be filed with the District prior to commencement of the Work. These certificates and the

insurance policies required by this Paragraph 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the District. If any of the foregoing insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment as required by Subparagraph 9.10.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

.1 Certificates of Insurance shall be filed with the District prior to commencement of the Work. In addition to Certificates of Insurance, the Contractor shall supply a written endorsement to the Contractor's general liability insurance policy that names the District as an additional insured. The endorsement shall provide that the Contractor's liability insurance policy shall be primary, and that any liability insurance of the District shall be secondary and noncontributory.

11.1.4 In no event shall any failure of the District to receive certified copies of certificates of policies required under Paragraph 11.1 or to demand receipt of such certified copies or certificates prior to the Contractor's commencing the Work be construed as a waiver by the District or the Architect of the Contractor's obligations to obtain insurance pursuant to this Article 11. The obligation to procure and maintain any insurance required by this Article 11 is a separate responsibility of the Contractor and independent of the duty to furnish a certified copy or certificate of such insurance policies. If the Contractor fails to purchase and maintain, or require to be purchased and maintained, any insurance required under this Article 11, the District may, but shall not be obligated to, upon five (5) days' written notice to the Contractor, purchase such insurance on behalf of the Contractor and shall be entitled to be reimbursed by the contractor upon demand.

11.1.5 The Aggregate Limits of Insurance required by Subparagraph 11.1.2 shall apply, in total, to this Contract only. This shall be indicated on the insurance certificate or an attached policy amendment.

.1 The insurance policies and Certificates of Insurance required by this Contract shall contain a provision that no material alteration, cancellation, nonrenewal, or expiration of the coverage contained in such policy or evidenced by such Certificates of Insurance shall have

effect unless the District has been given at least thirty (30) days' prior written notice. The Contractor shall provide a minimum of thirty (30) days' written notice to the District of any proposed reduction of coverage limits, including every coverage limit identified in Subparagraph 11.1.2, or any substitution of insurance carriers.

11.1.6 When any required insurance, due to the attainment of a normal expiration date or renewal date, shall expire, the Contractor shall supply the District with Certificates of Insurance and amendatory riders or endorsements that clearly evidence the continuation of all coverage in the same manner, limits of protection, and scope of coverage as was provided by the previous policy. In the event any renewal or replacement policy, for whatever reason obtained or required, is written by a carrier other than that with whom the coverage was previously placed, or the subsequent policy differs in any way from the previous policy, the Contractor shall also furnish the District with a certified copy of the renewal or replacement policy unless the District provides the Contractor with prior written consent to submit only a Certificate of Insurance for any such policy. All renewal and replacement policies shall be in form and substance satisfactory to the District and written by carriers acceptable to the District.

11.1.7 The Contractor shall cause each Subcontractor to (i) procure insurance reasonably satisfactory to the District and (ii) name the Contractor, District and Architect as additional insureds under the Subcontractor's comprehensive general liability policy. The additional insured endorsement included on the Subcontractor's comprehensive general liability policy shall state that coverage is afforded the additional insureds with respect to claims arising out of operations performed by on behalf of the Contractor. If the additional insureds have other insurance that is applicable to the loss, such other insurance shall be on an excess or contingent basis. The amount of the insurer's liability under this insurance policy shall not be reduced by the existence of such other insurance.

11.2 DISTRICT'S LIABILITY INSURANCE

11.2.1 The District shall be responsible for purchasing and maintaining the District's usual liability insurance.

11.3 *[This number intentionally not used.]*

11.4 PROPERTY INSURANCE

11.4.1 Unless otherwise provided, the District shall purchase and maintain property insurance in the

amount of the initial Contract Sum as well as subsequent modifications thereto for the entire Work at the site on a replacement cost basis. Such property insurance shall be maintained until final payment has been made as provided in Paragraph 9.10 or until no person or entity other than the District has an insurable interest in the property required by this Paragraph 11.4 to be covered, whichever is earlier. This insurance shall only cover the work owned by the District at the time of loss.

11.4.2 Property Insurance shall be written using a 'Builders Risk Coverage Form' with the following attached forms and endorsements:

- .1 Causes of Loss - Special Form; (Risks of Direct Physical Loss unless the loss is excluded or limited by the Form)
- .2 Causes of Loss - Earthquake Form; and
- .3 Flood Insurance.

11.4.3 Covered Property is the Building Under Construction described in the Policy Declarations owned by the District at the time of loss and includes:

- .1 Foundations;
- .2 If intended to become a permanent part of the building or structure described in the Declarations, the following property located in or on the building or structure or within 100 feet of its premises:
 - (1) Fixtures, machinery and equipment used to service the building; and
 - (2) Building materials and supplies used for construction;
- .3 If not covered by other insurance, temporary structures built or assembled on site, including cribbing, scaffolding and construction forms.

11.4.4 Replacement of insured damaged work shall be covered by an appropriate Change Order. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-Subcontractors in similar manner.

11.4.5 The District and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

11.4.6 The Contractor shall provide adequate insurance to protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the work.

11.4.7 The Contractor shall be responsible for the first \$2,500.00 towards any deductible in the District's policy.

11.5 PERFORMANCE BOND AND PAYMENT BOND

11.5.1 The Contractor shall provide Performance and Labor and Material Payment Bonds in the amount of 100% of the Contract Sum. The Contractor's cost of the bonds shall be included in the Contract Sum.

.1 The Surety shall have, at a minimum, a "Best Rating" of "A" as stated in the most current publication of "Best's Key Rating Guide, Property-Casualty." In addition, the Surety shall have a minimum "Best Financial Strength Category" no less than five (5) times the contract amount.

.2 The Performance Bond and the Payment Bond both shall be made payable to the District.

.3 The Performance and Labor and Material Payment Bonds shall:

- (1) be issued by a surety company licensed to do business in South Carolina; and,
- (2) be accompanied by a current power of attorney and certified by the attorney-in-fact who executes the bond on the behalf of the surety company; and,
- (3) remain in effect for a period not less than one (1) year following the date of Substantial Completion or the time required to resolve any items of incomplete Work and the payment of any disputed amounts, whichever time period is longer; and,
- (4) display the Surety's Bond Number. A rider including the following provisions shall be attached to each Bond stating that:
 - (a) The Surety hereby agrees that it consents to and waives notice of any addition, alteration, omission, change, or other modification of the Contract Documents. Any addition, alteration, change,

extension of time, or other modification of the Contract Documents, or a forbearance on the part of either the District or the Contractor to the other, shall not release the Surety of its obligations hereunder, and notice to the Surety of such matters is hereby waived.

(b) The Surety agrees that it is obligated under the bonds to any successor, grantee, or assignee of the District.

(5) Notwithstanding the foregoing, any bonds required by this Contract shall meet the requirements of the SC Code of Laws, as amended.

11.5.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall permit a copy to be made.

11.5.3 The Contractor must furnish the required bonds to the District no later than seven (7) days following execution of the Agreement.

11.5.4 The Contractor shall keep the Surety informed of the progress of the Work, and, where necessary, obtain the Surety's consent to, or waiver of:

- .1 notice of changes in the Work;
- .2 request for reduction or release of retention;
- .3 request for final payment; and
- .4 any other item required by the Surety.

The District may, in the District's sole discretion, inform the Surety of the progress of the Work and obtain consents as necessary to protect the District's rights, interest, privileges, and benefits under and pursuant to any bond issued in connection with the Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

12.1 UNCOVERING OF WORK

12.1.1 If a portion of the Work is covered contrary to the requirements specifically expressed in the Contract Documents, including inspections of work-in-progress as required by all authorities having jurisdiction over the Project, then the portion of Work so covered shall, upon

demand of the Architect or the authority having jurisdiction, be uncovered for observation and be replaced at the Contractor's expense without change in the Contract Time.

12.1.2 If a portion of the Work has been covered which the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the District's expense. If such Work is not in accordance with the Contract Documents, correction shall be at the Contractor's expense unless the condition was caused by the District or a separate Contractor in which event the District shall be responsible for payment of such costs.

12.2 CORRECTION OF WORK

12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

.1 The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense. If, prior to the date of Substantial Completion, the Contractor, a Subcontractor, or anyone for whom either is responsible, uses or damages any portion of the Work, including, without limitation, mechanical, electrical, plumbing, and other building systems, machinery, equipment, or other mechanical device, the Contractor shall cause such item to be restored to "like new" condition at no expense to the District.

.2 When the correction of defective and rejected work results in the Contractor or applicable Subcontractor falling behind schedule or will delay or prevent other trades from performing their portion of the Work, the Contractor or applicable Subcontractor shall use all possible means to maintain the original schedule and to allow other trades to perform their portion of the Work. Accordingly, the Contractor and applicable Subcontractor shall not be granted additional time or moneys to maintain the original

schedule.

12.2.2 AFTER SUBSTANTIAL COMPLETION

.1 In addition to the Contractor's obligations under Paragraph 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof, or after the date for commencement of warranties established under Subparagraph 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the District to do so unless the District has previously given the Contractor a specific written acceptance of such condition. During the one-year period for correction of Work, if the District knows of such a condition but thereafter fails to notify the Contractor and give the Contractor an opportunity to make the correction, the District waives the rights to require correction by the Contractor pursuant to this Subparagraph 12.2.2.1. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the District or Architect, the District may correct it in accordance with Paragraph 2.4.

.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual performance of the Work.

.3 Upon completion of any Work under or pursuant to Paragraph 12.2, the one (1) year correction period in connection with the Work requiring correction shall be renewed and recommence. The obligations under Paragraph 12.2 shall cover any repairs and replacement to any part of the Work or other property that is damaged by the defective Work.

.4 The District's right to have Work corrected pursuant to this Subparagraph 12.2.2 shall not in any way affect, exclude or limit any other right or remedy available to the District under South Carolina law.

12.2.3 The Contractor shall remove from the site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the

District.

12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the District or separate Contractors caused by the Contractor's correction or removal of Work which is not in accordance with the requirements of the Contract Documents.

12.2.5 Nothing contained in this Paragraph 12.2 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the one-year period for correction of Work as described in Subparagraph 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

12.3 ACCEPTANCE OF NONCONFORMING WORK

12.3.1 If the District prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the District may, but need not, do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

13.1.1 The Contract shall be governed by and construed in accordance with the laws of the State of South Carolina, and any suit, action or proceeding arising out of or relating to the Contract shall be governed by the laws of the State of South Carolina.

13.1.2 Contractor shall refer any questions, comments or directives from local officials to the District and the State Board of Education for resolution.

13.2 SUCCESSORS AND ASSIGNS

13.2.1 The District and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract

as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

13.3 WRITTEN NOTICE

13.3.1 Unless otherwise permitted herein, all notices contemplated by the Contract Documents shall be in writing and shall be deemed duly given:

.1 upon actual delivery to the person identified in the A101, if delivery by hand; or,

.2 upon receipt by the transmitting party of confirmation or reply, if delivery is by facsimile, telex or telegram; or,

.3 upon receipt by the person identified in the A101, if delivery is by deposit into the United States mail, certified mail, return receipt requested.

13.3.2 Each such notice shall be sent to the respective party at the address provided in the Agreement (AIA-A101 as modified), or to any other address as the respective party may designate by notice delivered pursuant hereto.

13.4 RIGHTS AND REMEDIES

13.4.1 Except as expressly provided in the Contract Documents, duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

13.4.2 No action or failure to act by the District, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

13.4.3 Termination of the Contract by either party for any reason shall not relieve the parties of any obligation theretofore accorded under this Contract. Notwithstanding Subparagraph 9.10.4, and without limiting the foregoing sentence, the following provisions (as amended) of the Contract Documents shall survive termination for whatever cause, expiration or completion:

.1 1.6 Ownership and Use of Drawings, Specifications and Other Instruments of Service;

3.5 Warranty
3.17 Royalties, Patents and Copyrights
3.18 Indemnification
4.3.10 Waiver of Listed Damages
4.3.11 Waiver of Claims Against the Architect
4.5 Dispute Resolution
7.5.5 Cost or Pricing Data
11.1 Contractor's Liability Insurance
11.5 Performance and Payment Bond
12.2 Correction of Work
13.1 Governing Law
13.4 Rights and Remedies
13.12 Retention and Audit of Contractor's Records

13.5 TESTS AND INSPECTIONS

13.5.1 Tests, inspections, special inspections, and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction shall be made at an appropriate time. Where field testing, inspections, or special inspections that are to be conducted by an independent testing agency are specified in the Contract Documents or field testing is required or requested by a governing agency, the District shall select, contract with, and pay for all services provided by said independent agency. The Contractor, in cooperation with the appropriate District representative, shall request and coordinate all site visits conducted by the independent agency. The independent agency shall submit all reports to the Architect and copies to the Contractor and the District. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The District shall bear costs of tests, inspections or approvals which do not become requirements until after bids are received or negotiations concluded.

.1 The District will employ and pay for a testing laboratory for general soils, concrete, steel, and metal framing testing. Whenever any retesting made necessary because of work performed by the Contractor that does not conform to the requirements of the Contract Documents, the Contractor shall pay the cost of this retesting. Testing shall be as required in the various sections of the Project Manual, Office of School Facilities requirements, and applicable building codes (including I.B.C. Chapters 1 and 17). Scheduling of testing shall be by the Contractor after first obtaining approval of the Architect.

13.5.2 If the Architect, District or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Subparagraph 13.5.1, the Architect will, upon written authorization from the District, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the District, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Subparagraph 13.5.3, shall be at the District's expense.

13.5.3 If such procedures for testing, inspection or approval under Subparagraphs 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense. The Contractor also agrees that the increased cost of testing services required on short notice or at unusual times for the convenience of the Contractor in its scheduling and performance of the Work, and the cost of testing services related to remedial operations performed to correct deficiencies in the Work, shall be borne by the Contractor.

13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing. The Contractor shall give the Architect timely notice in advance of tests, inspections or approvals.

13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

13.6 INTEREST

13.6.1 Payments made under the Contract Documents are subject to the requirements of Title 29, Chapter 6 of the South Carolina Code of Laws, as amended.

13.7 COMMENCEMENT OF STATUTORY LIMITATION PERIOD

13.7.1 As between the District and Contractor:

.1 Before Substantial Completion. As to acts or

failures to act occurring prior to the relevant date of Substantial Completion, any applicable statute of limitations or repose shall not commence to run and any alleged cause of action shall not be deemed to have accrued in any and all events prior to the date of Substantial Completion;

.2 Between Substantial Completion and Final Certificate for Payment. As to acts or failures to act occurring subsequent to the relevant date of Substantial Completion, any applicable statute of limitations or repose shall not commence to run and any alleged cause of action shall not be deemed to have accrued in any and all events prior to the date of issuance of the final Certificate for Payment; and

.3 After Final Certificate for Payment. As to acts or failures to act occurring after the relevant date of issuance of the final Certificate for Payment, any applicable statute of limitations or repose shall not commence to run and any alleged cause of action shall not be deemed to have accrued in any and all events prior to the date of any act or failure to act by the Contractor pursuant to any Warranty provided under Paragraph 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Paragraph 12.2, or the date of actual commission of any other act or failure to perform any duty or obligation by the Contractor or District, whichever occurs last.

.4 Nothing in this Paragraph 13.7 shall be construed to deny the District or the Contractor the benefit of any legal doctrine or statutory provision measuring a statute of limitation or repose on the basis of the discovery doctrine; rather the intent of Paragraph 13.7 is to firmly fix only the earliest, but not the actual, point in time to which such limitations or repose period could have begun to run.

13.8 *[Intentionally not used.]*

13.9 DRUG-FREE WORKPLACE.

The Contractor certifies to the District that Contractor will provide a Drug-Free Workplace, as required by Title 44, Chapter 107 of the South Carolina Code of Laws, as amended.

13.10 CANCELLATION AFTER AWARD

This Contract may be cancelled after award, but prior to issuance of the Notice to Proceed. In such event, the Contractor shall recover, as its sole remedy, its reasonable bid preparation costs.

13.11 BANKRUPTCY

In the event the Contractor enters into proceedings relating to bankruptcy, whether voluntary or involuntary, the Contractor agrees to furnish written notification of the bankruptcy to the District. This notification shall be furnished within five (5) days of the initiation of the proceedings relating to the bankruptcy filing. This notification shall include the date on which the bankruptcy petition was filed, the identity of the court in which the bankruptcy petition was filed, and a listing of all District contracts against which final payment has not been made. This obligation remains in effect until final payment under this Contract.

13.12 RETENTION AND AUDIT OF CONTRACTOR'S RECORDS

The District shall be entitled, at reasonable times and places, to audit the books and records of both the Contractor and any Subcontractor who has submitted cost or pricing data pursuant to this Contract or pursuant to the District's Procurement Code to the extent that such books and records relate to such cost or pricing data. If any cost or pricing data is required for this Contract or any Modification, the Contractor and any Subcontractor shall maintain such books and records that relate to such cost or pricing data for three (3) years from the date of final payment under the Contract, unless a shorter period is otherwise authorized in writing by the District; provided, however, that such records shall be retained for additional periods of time beyond this three-year period upon request of the District. If this Contract or any Modification (other than a firm fixed price contract) is negotiated, the District shall be entitled to audit the books and records of the Contractor and any Subcontractor to the extent that such books and records relate to the performance of the Contract or any Modification. Such books and records shall be maintained by the Contractor for a period of three years from the date of final payment under the prime contract and by any Subcontractor for a period of three years from the date of final payment under the subcontract, unless a shorter period is otherwise authorized in writing by the District.

13.13 [number intentionally not used]

13.14 PROCUREMENT OF MATERIALS BY DISTRICT

The Contractor accepts assignment of, and liability for, all purchase orders and other agreements for procurement of materials and equipment that are identified as part of the Contract Documents. The Contractor shall be responsible for such pre-purchased items, if any, as if the Contractor were the original purchaser. The Contract Sum includes, without limitation, all costs and expenses in connection with delivery, storage, insurance, installation, and testing of items covered in any assigned purchase orders or agreements. All warranty and correction of the Work obligations under the Contract Documents shall also apply to any pre-purchased items, unless the Contract Documents specifically provide otherwise.

13.15 GENERAL PROVISIONS

13.15.1 Whenever possible, each provision of this Agreement shall be interpreted in a manner as to be effective and valid under applicable law. If, however, any provision of this Agreement, or portion thereof, is prohibited by law or found invalid under any law, only such provision or portion thereof shall be ineffective, without in any manner invalidating or affecting the remaining provisions of this Agreement or valid portions of such provisions, which are hereby deemed severable.

13.15.2 Each party hereto agrees to do all acts and things and to make, execute and deliver such written instruments, as shall from time to time be reasonably required to carry out the terms and provisions of the Contract Documents.

13.15.3 Any specific requirement in this Contract that the responsibilities or obligations of the Contractor also apply to a Subcontractor is added for emphasis and is also hereby deemed to include a Subcontractor of any tier. The omission of a reference to a Subcontractor in connection with any of the Contractor's responsibilities or obligations shall not be construed to diminish, abrogate, or limit any responsibilities or obligations of a Subcontractor of any tier under the Contract Documents or the applicable subcontract.

13.15.4 All personal pronouns used in this Contract, whether used in the masculine, feminine, or neuter gender, shall include all other genders; and the singular shall include the plural and vice versa. Titles of Articles, paragraphs, and subparagraphs are for convenience only and neither limit nor amplify the provisions of this Contract in itself. The use herein of the word "including" when following any general statement, term, or matter, shall not be construed to limit such statement, term, or matter to the specific items or matters set forth immediately following such

word or to similar items or matters, whether or not non-limiting language (such words as “without limitation” or “but not limited to” or words of similar import) is used with reference thereto, but rather shall be deemed to refer to all other items or matters that could reasonably fall within the broadest possible scope of such general statement, term, or matter.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of ninety (90) consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-Subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- .1** issuance of an order of a court or other public authority having jurisdiction which requires all Work to be stopped;
- .2** an act of government, such as a declaration of national emergency which requires all Work to be stopped.

14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-Subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the District as described in Paragraph 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

14.1.3 If one of the reasons described in Subparagraph 14.1.1 or 14.1.2 exists, the Contractor may, upon seven-days' written notice to the District and Architect, terminate the Contract and recover from the District payment for Work executed. Any adjustment to the Contract Sum made pursuant to this Subparagraph shall be made in accordance with the requirements of Paragraph 7.5.

14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the District has persistently failed to fulfill the District's obligations under the Contract Documents with respect

to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the District and the Architect, terminate the Contract and recover from the District as provided in Subparagraph 14.1.3.

14.2 TERMINATION BY THE DISTRICT FOR CAUSE

14.2.1 The District may terminate the Contract, or any separable part of it, if the Contractor:

- .1** fails to complete the Work within the time specified in the Contract Documents, including any authorized adjustments; or,
- .2** fails to prosecute the Work, or any separable part of the Work, with the diligence, resources and skill that will ensure its completion within the time specified in the Contract Documents, including any authorized adjustments; or,
- .3** fails to make payment to Subcontractors for materials or labor in accordance with Title 29, Chapter 6 of the South Carolina Code of Laws, as amended, and the respective agreements between the Contractor and the Subcontractors; or,
- .4** persistently and/or intentionally disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction; or,
- .5** fails to proceed as required by Subparagraph 4.3.3 pending final resolution of a Claim; or,
- .6** fails to comply with any of the other material provisions of this Contract.

14.2.2 The District's right to terminate this Contract under Subparagraph 14.2.1 may be exercised if the Contractor does not cure such failure within seven (7) days (or more if authorized in writing by the District) after receipt of the notice from the District specifying the general nature of the failure. The District shall notify the Contractor's surety within a reasonable time. When terminating pursuant to Paragraph 14.2, the District may, without prejudice to any other rights or remedies of the District, and subject to any prior rights of the surety:

- .1** take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by

the Contractor;

.2 accept assignment of subcontracts pursuant to Paragraph 5.4; and

.3 finish the Work by whatever reasonable method the District may deem expedient. Upon request of the Contractor, the District shall furnish to the Contractor a detailed accounting of the costs incurred by the District in finishing the Work.

14.2.3 When the District terminates the Contract for one of the reasons stated in Subparagraph 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages, including Liquidated Damages, if any, incurred by the District and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the District. The amount to be paid to the Contractor or District, as the case may be, shall be certified by the Architect, upon application, and this obligation for payment shall survive termination of the Contract.

14.3 SUSPENSION BY THE DISTRICT FOR CONVENIENCE

14.3.1 The District, through the Architect, may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the District may determine.

14.4 TERMINATION BY THE DISTRICT FOR CONVENIENCE

14.4.1 The District may, at any time, terminate the Contract, or the Contract Work, in whole or in part, for the District's convenience and without cause.

14.4.2 Upon written consent of the Contractor, the District may reinstate the terminated portion of this Contract or Contract Work in whole or in part by amending the notice of termination if it has been determined that:

- .1 circumstances clearly indicate a requirement for the terminated work; and,
- .2 reinstatement of the terminated work is advantageous to the District.

14.4.3 Upon such termination, the Contractor shall

recover as its sole remedy payment for Work properly performed in connection with the terminated portion of the Work prior to the effective date of the termination and for items properly and timely fabricated off the Project site, delivered and stored in accordance with the District's instructions. The Contractor hereby waives and forfeits all other claims for payment and damages, including, without limitation, anticipated profits. The District shall be credited for (i) payments previously made to the Contractor for the terminated portion of the Work, (ii) claims that the District has against the Contractor under the Contract, and (iii) the value of materials, supplies, equipment, or other items that are to be disposed of by the Contractor that are part of the Contract Sum.

14.4.4 Upon receipt of written notice from the District of such termination for the District's convenience, the Contractor shall:

- .1 cease operations as directed by the District in the notice;
- .2 take actions necessary, or that the District may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.
- .4 complete the performance of the Work not terminated, if any.

ARTICLE 3
DATES OF COMMENCEMENT AND SUBSTANTIAL COMPLETION;
LIQUIDATED DAMAGES FOR LATE COMPLETION OF PHASES

3.1 The Date(s) of Commencement shall be established in a "Notice to Proceed" (for each project separately, if this is a combined award). A Notice to Proceed shall be issued to the Contractor in writing, upon execution of this Agreement. Failure by the Contractor to commence actual physical work on the project within seven (7) days from the Date of Commencement, as established in the Notice to Proceed, will entitle the District to consider the Contractor in substantial breach of its obligations under this Contract. In this event, the District may withdraw the Notice to Proceed and terminate the Contract in accordance with the Contract Documents.

3.2 The Contract Time shall be measured from, and includes, the Date of Commencement stated in the Notice to Proceed.

3.3 The Contractor shall achieve Substantial Completion and the Final Completion of the Work as follows subject to adjustments of this Contract Time as provided in the Contract Documents:

Notice to Proceed:	April 1, 2016 Pending Board Approval
Substantial/Final Completion:	July 15, 2016
Completion of Punchlists:	30 days after Substantial Completion

3.4 The Contractor acknowledges and recognizes that the District is entitled to full and beneficial occupancy and use of the completed Work following expiration of the Contract Time. It is hereby mutually agreed by and between the parties that time shall be an essential part of the Agreement and the Contractor further acknowledges and agrees that if the Contractor fails to complete or cause the Final Completion of any portion of the Work within the Contract Time, the District will sustain extensive damages and serious loss as a result of such failure. The exact amount of such damages will be extremely difficult to ascertain. Therefore, the District and the Contractor agree as set forth below:

.1 Failure to Achieve Substantial Completion on Time: If the Contractor fails to achieve Substantial Completion of the Work of each Phase within the Time for Completion allowed in the Agreement, the District shall be entitled to retain or recover from the Contractor and its Surety, as liquidated damages and not as a penalty, the amount of **Five Hundred Dollars (\$500.00) per day** commencing upon the first day following expiration of the specified or adjusted time of performance and continuing until the actual Date of Substantial Completion. Such liquidated damages are hereby agreed to be a reasonable estimate of damages the District will incur as a result of delayed completion of the Work. A non-exhaustive list of the types of damages the Owner may incur as a result of breach of contract by failure to achieve substantial completion, and within the contemplation of liquidated damages as herein agreed, are: use of relocatable classrooms; disruption of class locations; disruption of athletic program; disruption or inefficiency in food services; disruption of public service activities planned for the project; loss of rental of the project; increased security risks and costs; disruption of the teaching and learning process; inefficiencies in handling fixtures, furnishings, and equipment; harm to the Owner's reputation and established goodwill among the community, parents, students, and staff due to late delivery of the project; loss of student morale and academic performance due to the ongoing Work during the academic term; harm to the Owner's relationship with public entities; harm to the Owner's reputation with vendors; disruption and inefficiency of the management of all the Owner's building program and maintenance projects.

.2 Failure to Achieve Final Completion on Time: After Substantial Completion of a Phase, if the Contractor fails to achieve Final Completion of the Work of such Phase within the Time for Final Completion allowed in the Agreement, the District shall be entitled to retain or recover from the Contractor and its Surety, as liquidated damages and not as a penalty, the amount of **Five Hundred Dollars (\$500.00) per day** commencing upon the first day following expiration of the specified or adjusted time of performance and continuing until the actual Date of Final Completion. Such liquidated damages are hereby agreed to be a reasonable estimate of damages the District will incur as a result of delayed completion of the Work.

.3 The District may deduct liquidated damages described in Subparagraphs 3.4.1 and 3.4.2 from any unpaid amounts then or thereafter due the Contractor under this Agreement. Any liquidated damages not so deducted from any unpaid amounts due the Contractor shall be payable to the District by the Contractor or its Surety at the demand of the District.

ARTICLE 4 CONTRACT SUM

4.1 The District shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract.

The Contract Sum is no cents. (\$0.00), subject to additions and deductions as provided in the Contract Documents.

4.2 The Contract Sum includes the following Alternates, which are described in the Contract Documents:
[NOTE: Delete Non-Accepted Alternates]

4.3 UNIT PRICES. Unit prices, if any, are as follows:

.1 Unit prices are considered complete and include: (i) all materials, equipment, labor, delivery, installation, overhead, and profit; and, (ii) any other costs or expenses in connection with, or incidental to, the performance of that portion of the Work to which such unit prices apply.

ARTICLE 5 PAYMENTS

5.1 PROGRESS PAYMENTS

.1 Based upon Applications for Payment, including all supporting documentation, submitted to the District through the Architect by the Contractor and Certificates for Payment issued by the Architect, the District shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month.

.3 An Application for Payment, including all supporting documentation, for the period of time established in Subparagraph 5.1.2 shall be received by the Architect not later than **Five (5)** days after the end of the period for which the Contractor is making application for payment. Payment on approved amounts shall be made by the District not later than twenty-one (21) days after the Districts receives the Application for Payment.

.1 FULLY EXECUTED PAYMENT BOND WAIVERS FROM SUBCONTRACTORS AND SUPPLIERS IN THE AMOUNT OF EACH SUBCONTRACTOR'S OR SUPPLIER'S CLAIMED PAYMENT MUST BE SUBMITTED WITH THE APPLICATION FOR PAYMENT.

.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, in conjunction with on-site verifications, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

.5 Applications for Payment shall indicate the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment. Each Application for Payment shall include

such other information, documentation, and materials as the District or the Architect may require to substantiate the Contractor's entitlement to payment.

.6 Subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

(1) Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of three-point-five percent (3.5%). Pending final determination of cost to the District of changes in the Work, amounts not in dispute shall be included as provided in Subparagraph 7.3.8 of the General Conditions;

(2) Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the District, suitably stored off the site at a location agreed upon in writing), less retainage of three-point-five percent (3.5%).

(3) Subtract the aggregate of previous payments made by the District; and

(4) Subtract amounts, if any, for which the Architect has withheld or nullified a Certificate for Payment as provided in Paragraph 9.5 of the General Conditions.

.7 The progress payment amount determined in accordance with Subparagraph 5.1.6 shall be further modified under the following circumstances:

(1) Add, upon Substantial Completion of the Work, a sum sufficient to increase the total payments to ninety-six-point-five percent (96.5%) of the Contract Sum, less such amounts as the Architect shall determine for incomplete and unacceptable Work, retainage applicable to such work and unsettled claims; and

(2) Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable in accordance with Subparagraph 9.10.3 of the General Conditions.

.8 Reduction or limitation of retainage, if any, shall be as follows: Until Substantial Completion, the District shall pay 96.5 percent of the amount due the contractor on account of progress payments. At the time the Work is substantially complete and thereafter, and with the approval of the District, the Architect may authorize remaining partial payments to be paid in full, if the Contractor is performing the work and is adhering to the construction schedule.

(1) Any reduction or release of retainage, or portion thereof, however, shall not be a waiver of: (i) any of the District's rights to retainage in connection with other payments to the Contractor; or, (ii) any other right or remedy that the District has under the Contract Documents, at law or in equity.

.9 Except with the District's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

5.2 FINAL PAYMENT

.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the District to the Contractor when:

(1) the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Subparagraph 12.2.2 of the General Conditions, and to satisfy any other requirements which extend beyond final payment; and

(2) a final Certificate for Payment has been issued by the Architect.

.2 Final payment shall be made within twenty-one (21) days from the date the District receives the final undisputed Certificate for Payment, including all supporting documentation, from the Contractor through the Architect. All conditions stipulated in the General Conditions shall be met before final payment is made.

**ARTICLE 6
TERMINATION OR SUSPENSION**

6.1 The Contract may be terminated by the District or the Contractor as provided in Article 14 of the General Conditions.

6.2 The Work may be suspended by the District as provided in Article 14 of the General Conditions.

**ARTICLE 7
MISCELLANEOUS PROVISIONS**

7.1 *[This paragraph number intentionally not used.]*

7.2 *[This paragraph number intentionally not used.]*

7.3 The District's Representative is: Mr. Wess Grant, Anderson School District Five

7.4 The Contractor's representative is: _____.

7.5 Neither the District's nor the Contractor's representative shall be changed without ten days' written notice to the other party.

7.6 Other provisions:

7.6.1 Contractor shall not incur any expense chargeable to the District on or about the Work of this Agreement until the Notice to Proceed is issued. The Contractor shall not proceed with any Work not contemplated by this Contract until and unless a Modification is issued.

7.6.2. The Contractor represents and warrants the following to the District (in addition to any other representations and warranties contained in the Contract Documents), as an inducement to the District to execute this Agreement, which representations and warranties shall survive the execution and delivery of this Agreement, any termination of this Agreement, and the final completion of the Work:

- .1** that it and its Subcontractors are financially solvent, able to pay all debts as they mature, and possessed of sufficient working capital to complete the Work and perform all obligations hereunder;
- .2** that it is able to furnish the plant, tools, materials, supplies, equipment, and labor required to complete the Work and perform its obligations hereunder;
- .3.** that it and its Subcontractors are at all times authorized to do business in the State of South Carolina and properly licensed by all necessary governmental and public and quasi-public authorities having jurisdiction over it and over the Work and the Project;
- .4** that its execution of this Agreement and its performance thereof is within its duly authorized powers;
- .5** that its duly authorized representative has visited the site of the Project, familiarized himself with the local and special conditions under which the Work is to be performed, and correlated his observations with the requirements of the Contract Documents; and
- .6** that it and its Subcontractors possess a high level of experience and expertise in the business administration, construction, construction management, and superintendence of projects of the size, complexity, and nature of this particular Project, and it will perform the Work with the care, skill, and diligence of such a contractor.

The foregoing warranties are in addition to, and not in lieu of, any and all other liability imposed upon the Contractor by law with respect to the Contractor's duties, obligations, and performance hereunder. The Contractor acknowledges that the District is relying upon the Contractor's skill and experience in connection with the Work called for hereunder.

7.6.3 The District reserves the right, pursuant to Article 7 of the General Conditions, to modify the Work of the Contractor.

7.6.4. Venue Agreement.

.1 Contractor agrees that judicial venue for any suit, action or proceeding arising out of or relating to the Agreement shall be proper only in (1) a State court of competent jurisdiction in Anderson County, State of South Carolina, or (2) the division of the Federal District Court for the District of South Carolina in which the Project is located.

.2 This contract is formed pursuant to the Anderson School District Five Procurement Code, including its dispute resolution rules. The Contractor and the District hereby waive and disclaim any and all right to a jury trial on any controversy arising from this Agreement. Notwithstanding any other agreement between Contractor and the District, the Agreement shall be governed by and construed in accordance with the laws of the State of South Carolina, and any suit, action or proceeding arising out of or relating to the Agreement shall be governed by the laws of the State of South Carolina. Contractor agrees that any act by the District regarding the Agreement is not a waiver of either the District's sovereign immunity or the District's immunity under the Eleventh Amendment of the United States Constitution.

.3 Notwithstanding the foregoing provisions, the parties may, by mutual agreement and consent, engage in non-binding mediation of disputes.

7.6.5 Termination of the Contract by either party for any reason shall not relieve the parties of any obligation theretofore accorded under this Contract.

7.6.6 This Contract may be cancelled after award, but prior to issuance of the Notice to Proceed. In such event, the Contractor shall recover, as its sole remedy, its reasonable bid preparation costs.

**ARTICLE 8
ENUMERATION OF CONTRACT DOCUMENTS**

8.1 The Contract Documents, except for Modifications issued after execution of this Agreement, are enumerated as follows:

The Contract Documents consist of this Agreement between District and Contractor (hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect.

ACKNOWLEDGEMENTS:

This Agreement is entered into as of the day and year first written above and is executed in at least three original copies, of which one is to be delivered to the Contractor, one to the Architect for use in the administration of the Contract, and the remainder to the District.

FOR THE DISTRICT

FOR THE CONTRACTOR

By Authority of the Board of Trustees:
Thomas A. Wilson, Superintendent
Anderson School District Five
400 Pearman Diary Road
Anderson, South Carolina 29622

By: _____
As its: _____



AIA® Document A310™ – 2010

Bid Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

Anderson County School District Five
400 Pearman Dairy Road
Anderson, SC 29625

BOND AMOUNT: \$**PROJECT:**

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

Project Challenge Playhouse
New Storage Building & Site Improvements
2005 N. Main Street
Anderson, SC 29621

ADDITIONS AND DELETIONS:

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

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

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

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

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

When this Bond has been furnished to comply with a statutory or other legal requirement in the location of the Project, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such

Init.



AIA® Document A312™ – 2010

Performance Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

Anderson County School District Five
400 Pearman Dairy Road
Anderson, SC 29625

CONSTRUCTION CONTRACT

Date:

Amount: \$

Description:

(Name and location)

Project Challenge Playhouse
New Storage Building & Site Improvements
2005 N. Main Street
Anderson, SC 29621

BOND

Date:

(Not earlier than Construction Contract Date)

Amount: \$

Modifications to this Bond: None See Section 16

CONTRACTOR AS PRINCIPAL

Company: *(Corporate Seal)*

SURETY

Company: *(Corporate Seal)*

Signature: _____

Name and

Title:

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

Signature: _____

Name and

Title:

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:

(Architect, Engineer or other party:)

ADDITIONS AND DELETIONS:

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

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

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

Init.

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

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

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

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

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

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

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

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

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

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

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

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

Init.

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

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

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

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

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

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

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

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

§ 14 Definitions

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

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

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

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

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

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

§ 16 Modifications to this bond are as follows:

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

CONTRACTOR AS PRINCIPAL

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____

SURETY

Company: _____ (Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____



AIA[®] Document A312[™] – 2010

Payment Bond

CONTRACTOR:

(Name, legal status and address)

SURETY:

(Name, legal status and principal place of business)

OWNER:

(Name, legal status and address)

Anderson County School District Five
400 Pearman Dairy Road
Anderson, SC 29625

CONSTRUCTION CONTRACT

Date:

Amount: \$

Description:

(Name and location)

Project Challenge Playhouse
New Storage Building & Site Improvements
2005 N. Main Street
Anderson, SC 29621

BOND

Date:

(Not earlier than Construction Contract Date)

Amount: \$

Modifications to this Bond: None See Section 18

CONTRACTOR AS PRINCIPAL

Company: *(Corporate Seal)*

SURETY

Company: *(Corporate Seal)*

Signature: _____

Name and

Title:

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

Signature: _____

Name and

Title:

(FOR INFORMATION ONLY — Name, address and telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE:

(Architect, Engineer or other party:)

ADDITIONS AND DELETIONS:

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

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

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

Init.

AIA Document A312[™] – 2010 Payment Bond. The American Institute of Architects. All rights reserved. **WARNING: This AIA[®] Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA[®] Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 08:25:17 on 03/03/2015 under Order No.2173500158_1 which expires on 12/16/2015, and is not for resale.

User Notes:

(1095396719)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

§ 16 Definitions

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

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

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

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

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

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

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

§ 18 Modifications to this bond are as follows:

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

CONTRACTOR AS PRINCIPAL

Company: _____
(Corporate Seal)

SURETY

Company: _____
(Corporate Seal)

Signature: _____
Name and Title: _____
Address: _____

Signature: _____
Name and Title: _____
Address: _____



AIA® Document G701™ – 2001

Change Order

PROJECT <i>(Name and address):</i> Project Challenge Playhouse New Storage Building & Site Improvements 2005 N. Main Street Anderson, SC 29621	CHANGE ORDER NUMBER: 001 DATE: ARCHITECT'S PROJECT NUMBER: 015048.00 CONTRACT DATE: CONTRACT FOR: General Construction	OWNER: <input type="checkbox"/> ARCHITECT: <input type="checkbox"/> CONTRACTOR: <input type="checkbox"/> FIELD: <input type="checkbox"/> OTHER: <input type="checkbox"/>
TO CONTRACTOR <i>(Name and address):</i>		

THE CONTRACT IS CHANGED AS FOLLOWS:

(Include, where applicable, any undisputed amount attributable to previously executed Construction Change Directives)

The original Contract Sum was	\$	0.00
The net change by previously authorized Change Orders	\$	0.00
The Contract Sum prior to this Change Order was	\$	0.00
The Contract Sum will be increased by this Change Order in the amount of	\$	0.00
The new Contract Sum including this Change Order will be	\$	0.00

The Contract Time will be increased by Zero (0) days.
The date of Substantial Completion as of the date of this Change Order therefore is

NOTE: This Change Order does not include changes in the Contract Sum, Contract Time or Guaranteed Maximum Price which have been authorized by Construction Change Directive until the cost and time have been agreed upon by both the Owner and Contractor, in which case a Change Order is executed to supersede the Construction Change Directive.

NOT VALID UNTIL SIGNED BY THE ARCHITECT, CONTRACTOR AND OWNER.

_____ ARCHITECT <i>(Firm name)</i>	_____ CONTRACTOR <i>(Firm name)</i>	_____ OWNER <i>(Firm name)</i>
_____ ADDRESS	_____ ADDRESS	_____ ADDRESS
_____ BY <i>(Signature)</i>	_____ BY <i>(Signature)</i>	_____ BY <i>(Signature)</i>
_____ <i>(Typed name)</i>	_____ <i>(Typed name)</i>	_____ <i>(Typed name)</i>
_____ DATE	_____ DATE	_____ DATE



AIA Document G702™ - 1992

Application and Certificate for Payment

TO OWNER: Anderson County School District Five
400 Pearman Dairy Road
Anderson, SC 29625

PROJECT: Project Challenge Playhouse
New Storage Building & Site Improvements
2005 N. Main Street
Anderson, SC 29621

APPLICATION NO: 001
PERIOD TO:

CONTRACTOR:

VIA ARCHITECT:

CONTRACT FOR: General Construction
CONTRACT DATE:
PROJECT NOS: 015048.00

Distribution to:
OWNER:
ARCHITECT:
CONTRACTOR:
FIELD:
OTHER:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

- 1. ORIGINAL CONTRACT SUM \$ 0.00
- 2. NET CHANGE BY CHANGE ORDERS \$ 0.00
- 3. CONTRACT SUM TO DATE (Line 1 ± 2) \$ 0.00
- 4. TOTAL COMPLETED & STORED TO DATE (Column G on G703) \$ 0.00

- 5. RETAINAGE:
 - a. 0 % of Completed Work (Column D + E on G703) \$ 0.00
 - b. 0 % of Stored Material (Column F on G703) \$ 0.00

Total Retainage (Lines 5a + 5b or Total in Column I of G703) \$ 0.00

6. TOTAL EARNED LESS RETAINAGE \$ 0.00
(Line 4 Less Line 5 Total)

7. LESS PREVIOUS CERTIFICATES FOR PAYMENT \$ 0.00
(Line 6 from prior Certificate)

8. CURRENT PAYMENT DUE \$ 0.00

9. BALANCE TO FINISH, INCLUDING RETAINAGE
(Line 3 less Line 6)

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	\$ 0.00	\$ 0.00
Total approved this Month	\$ 0.00	\$ 0.00
TOTALS	\$ 0.00	\$ 0.00
NET CHANGES by Change Order	\$	0.00

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR: _____
By: _____ Date: _____
State of: _____
County of: _____

Subscribed and sworn to before me this _____ day of _____
Notary Public: _____
My Commission expires: _____

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED \$ 0.00
(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT: _____
By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.



AIA[®] Document G706[™] – 1994

Contractor's Affidavit of Payment of Debts and Claims

PROJECT: *(Name and address)*

Project Challenge Playhouse
New Storage Building & Site Improvements
2005 N. Main Street Anderson, SC 29621

ARCHITECT'S PROJECT NUMBER: 015048.00

CONTRACT FOR: General Construction

TO OWNER: *(Name and address)*

Anderson School District Five
400 Pearman Dairy Road
Anderson, SC 29625

CONTRACT DATED:

OWNER:

ARCHITECT:

CONTRACTOR:

SURETY:

OTHER:

STATE OF:
COUNTY OF:

The undersigned hereby certifies that, except as listed below, payment has been made in full and all obligations have otherwise been satisfied for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contractor for damages arising in any manner in connection with the performance of the Contract referenced above for which the Owner or Owner's property might in any way be held responsible or encumbered.

EXCEPTIONS:

SUPPORTING DOCUMENTS ATTACHED HERETO:

1. Consent of Surety to Final Payment. Whenever Surety is involved, Consent of Surety is required. AIA Document G707, Consent of Surety, may be used for this purpose

Indicate Attachment Yes No

CONTRACTOR: *(Name and address)*

BY: _____

(Signature of authorized representative)

(Printed name and title)

The following supporting documents should be attached hereto if required by the Owner:

1. Contractor's Release or Waiver of Liens, conditional upon receipt of final payment.
2. Separate Releases or Waivers of Liens from Subcontractors and material and equipment suppliers, to the extent required by the Owner, accompanied by a list thereof.
3. Contractor's Affidavit of Release of Liens (AIA Document G706A).

Subscribed and sworn to before me on this date:

Notary Public:
My Commission Expires:



AIA[®] Document G707[™] – 1994

Consent Of Surety to Final Payment

PROJECT: <i>(Name and address)</i> Project Challenge Playhouse New Storage Building & Site Improvements 2005 N. Main Street Anderson, SC 29621	ARCHITECT'S PROJECT NUMBER: 015048.00	OWNER: <input type="checkbox"/>
TO OWNER: <i>(Name and address)</i> Anderson School District Five 400 Pearman Dairy Road Anderson, SC 29625	CONTRACT FOR: General Construction	ARCHITECT: <input type="checkbox"/>
	CONTRACT DATED:	CONTRACTOR: <input type="checkbox"/>
		SURETY: <input type="checkbox"/>
		OTHER: <input type="checkbox"/>

In accordance with the provisions of the Contract between the Owner and the Contractor as indicated above, the
(Insert name and address of Surety)

on bond of
(Insert name and address of Contractor)

, SURETY,

hereby approves of the final payment to the Contractor, and agrees that final payment to the Contractor shall not relieve the Surety
of any of its obligations to
(Insert name and address of Owner)

, CONTRACTOR,

as set forth in said Surety's bond.

, OWNER,

IN WITNESS WHEREOF, the Surety has hereunto set its hand on this date:
(Insert in writing the month followed by the numeric date and year.)

(Surety)

(Signature of authorized representative)

(Printed name and title)

Attest:
(Seal):

REQUEST FOR SUBSTITUTE FORM

INSTRUCTIONS

Please read the specifications before completing this form.

This form is only applicable to requests for substitutes that are made during the Bidding Phase. All requests for substitutes after Contract Execution shall be in accordance with the General Requirements Section 01631 – Substitutions. Although the form is detailed and the requested information is specific, it is no more than what was requested from manufactures that are listed in the project specifications. However, approval of this form does not necessarily imply approval for future projects. Products, materials, and components not specified or approved but are installed will be removed and replaced with acceptable products, materials, components at the Contractors expense.

Submit this form along with all required supporting product data, specifications and performance criteria when requesting the use of products or services that are not listed in the Specifications. The Architect must receive this Request For Substitute form no later than the time stated in the Bidding Requirements for submitting product substitutions. If no time is stated, then no later than 10 days prior to date of bid opening.

Where the Contract Documents list at least three manufacturers or products, the Architect reserves the option to reject any and all requests for substitute. Where the Contract Documents list only one manufacture or product without “Or equal” or similar language, substitutes will not be considered. Where the Contract Documents list less than 3 products or manufacturers, substitutes may be reviewed and evaluated on an individual base.

Receipt of inquiries or submittals without this completed Request For Substitute form will not extend the deadline. Include only one request for substitution on each form. Verbal requests for a substitute or requests submitted on the incorrect request for substitute form are not acceptable and will not extend the submittal deadline established by the Instructions To Bidders. Incomplete forms; forms with vague or unspecific answers; forms without supporting data to substantiate equal or superior quality/design; forms that do not include requested proof, verification, reports, and substantiating documentation; or forms received after the time established in the Instructions will be disapproved. Disapproval will not extend the submittal deadline.

The manufacturer’s published literature, description, capabilities, operating and performance parameters, options, accessories, etc. of all submitted substitutes shall meet or exceed those published by the manufacturer of the specified item even if they are not specifically mentioned in the Contract Documents. Products of manufacturers other than those specified may be acceptable after proper submittal to the Architect and after the Architect’s review. However, manufacturers capable of providing specified products shall not, for the convenience of their normal production methods, vary from the specified product.

Where test data and standards are being submitted as supporting data and for comparison with the specified item, submit certified data provided by an independent testing laboratory. Prepare supporting data in side-by-side tabular form showing the submitted criteria next to each specified performance criteria and denoting the differences between the specified item the substitute item. Show submitted data using same tests and standards and with the values and results in the same units of measure as those shown for the specified item. Where a performance criterion is not listed in the specifications, comply with the specified product manufacturer’s published data for performance criteria. Identify and define all abbreviations and acronyms. All substitutes shall meet all of the minimum performance criteria of the specified product. Submittals not complying with this provision will be considered incomplete, unacceptable, and will be rejected. Where not applicable or NA is entered, state why the item is not applicable. Knowingly and intentionally

providing incorrect information is fraud.

Complete the following parts as follows:

PART 1: Complete for all requests for substitutes. Contains general, substitute product, marketing/sales, manufacturer, warranty.

PART 2: Complete only for countertops and casework, millwork, etc. substitutes.

PART 3: Complete only for steel

PART 4: Complete only for painting substitutes.

PART 5: Complete only for all roofing substitutes.

PART 1 (All Substitutes)

Project Name: Anderson School District Five
Project Challenge Playhouse
New Storage Building & Site Improvements
Anderson, South Carolina

Date:

Specification No.:

Drawing No. Reference:

Name of Specified Item:

Substitute Information

Name of Substitute:

Manufacturer of Substitute:

Name:

Address:

Telephone No.:

Fax No:

Years in Business:

General Information

1. Has the entity submitting this Request For Substitute read and fully understands the applicable specifications and stated provisions. Yes ___ No ____. If no, please explain.

2. Is this request at the request of subcontractor or general contractor? Yes ___ No ___

If yes, please give the name and address of that subcontractor or general contractor.

3. If the entity requesting the substitute will not be the installer, please provide the following information about the intended installer:

Name:

Address:

Telephone No.: _____ Fax No: _____
Years in Business: _____ Years installing this product: _____
Did the manufacturer certify the installer? Yes ___ No ___ If yes, when: _____
Is the certification still effective? Yes ___ No ___
Did the manufacturer train the installer? Yes ___ No ___ If yes, when: _____

4. If the entity requesting the substitute is a distributor, list all installers within 50 miles of the project site that you sell to:

5. Who will service the substitute?

6. Why is this substitute being requested? (Competitive pricing or being local are not acceptable answers. Please be specific!)

Substitute Product Information

1. Including installation and operational costs, will the substitute be less expensive than the specified entity? Yes ___ No ___ Same ___. (Don't know or can't be determined are not an acceptable answers)

a. If No or the same, why should the substitute be considered? If more expensive, why is it more expensive? (Please be specific!).

b. If less expensive, why is it less expensive? (Please be specific)

2. What is the functional and physical difference between the specified item and the substitute? If there are no differences, why should this substitute be approved? (Please be specific!)

3. Other than cost, what are the proven and verifiable benefits or advantages of the substitute item? (Please be specific! Convince us. Don't just reference product data. Being local does not necessarily mean better or more economical. Mention any unique benefits or attributes). If there are none, why should this substitute be approved?

a. If the substitute is more economical, why is it more economical? Please provide detailed cost comparison including material and labor as to why costs are more economical.

b. If the substitute is better, why/how is it better? Show side-by-side comparison

c. What does the substitute do that the specified will not do?

d. If service for the substitute is better, why/how is it better?

4. Are there any known failures of the substitute? If so, where and when did the failures occur

and what was the probable cause of the failures?

5 Will the Owner have difficulty getting the substitute serviced or repaired?

6 Does the substitute installer meet all of the specified qualifications and requirements? Yes: ___
No: ___. If no, please describe the differences.

7. Will the proposed substitution affect dimensions shown on the Drawings? Yes ___ No ___. If yes, please explain.

8. Will the proposed substitution have an adverse affect on other trades, the construction schedule, or specified warranty requirements. Yes ___ No ___ If yes, please explain.

10. Will maintenance and service parts for the proposed substitution will be readily available locally? Yes ___ No ___ If no, please explain.

11. Will the proposed substitute meet or exceed all aspects of the specifications, including overall performance, appearance, and manufacturer's/installers qualifying criteria stated in the Contract Documents? Yes ___ No ___ If no, please explain.

12 Will the proposed substitute meet all applicable governing codes, regulations, and listed or indicated UL assemblies? Yes ___ No ___ Not Applicable ___ If no, please explain.

13. Does the substitute have any affect on other contractors or trades? Yes ___ No ___. If yes, please explain.

Sales/Marketing Information

1. How long has this substitute been on the market? _____ years.

2. Did this substitute replace a previous product? Yes ___ No ___. If yes, why.

3. Is the substitute an improvement of a previous product? Yes ___ No ___. If yes, what is the improvement.

4. What was the annual sales volume of this substitute last year?

5. How much more or less is this than the previous year's volume? More _____ Less _____

6. In sales volume of this product, where does the manufacturer rank compared to other manufacturers of the same product? Top 5 10, 15, 20 of _____ manufacturers.

7. How long has the substitute been marketed locally (within 75 miles) to the project? _____ years. List 3 local installations of comparable type, size, and scope where substitute has been successfully used and has been in place and in use for a minimum of 3 years:

- a.
- b.
- c.

8. If the product has not been installed locally (within 75 miles), why do you think that is so?

9. If substitute has been marketed elsewhere, but not locally to the project, why?

10. Is substitute listed in SWEETS Catalogs? Yes ___ No ___ If no why?

11. Is product listed in AIA Masterspec? Yes___ No___ If no, why?

12. Has this same substitute been marketed under a different name or by a different manufacturer? Yes___ No___ If so, please state details

Manufacturer/Fabricator Information

1. How long has the manufacture been in business? _____ years.

2. How long has the manufacturer been operating under the present name? _____ years.

3. Has the manufacturer operated under any other name? Yes___ No___ If so, what name?

4. What other products does the manufacturer produce?

5. Has the manufacture, supplier, or contractor ever failed to complete any portion of any assigned or contracted work? Yes___ No___ If yes, please explain.

6. Does the substitute manufacturer meet all of the specified qualifications and requirements? Yes:___ No:___ . If no, please describe the differences.

7. When specified, will the installers be certified and factory-trained by the manufacturer? Yes ___No___ Not Applicable_____ If no, please explain.

8. Does the manufacturer presently meet all specified qualifying criteria. Yes___No___ . If no, please explain.

9. Does the manufacturer comply with the special warranty provisions, when they are specified. Yes ___No___ Not Applicable_____ If no, please explain.

10. Will the installer meet all specified qualifying criteria. Yes___No___ . If no, please explain.

Warranty Information

1. Does substitute manufacturer provide a warranty? Yes:_____ No:_____.

2. If no, why not?

3. If yes, are the warranty provisions equal to or better than those of the specified product, including the exclusions? Yes:_____ No:_____.

4. What provisions or exclusions does the substitute manufacturer's warranty have that are not in the specified warranty?

5. If the manufacturer's warranty period exceeds the time the manufacturer has been in business or the time the product has been available or marketed, how was the warranty time determined? Please be specific.

6. How many warranty claims have been filed against this product in the last 5 years? If product is less than 5 years old, then how may claims since the product was introduced? 0___ 1-5___

6-10___ Over 10___.

7. Are there outstanding warranty claims against this product now? Yes:___ No:___ . If yes, what is the longest period? ___months. What is its disposition.

8. If there has been warranty a claim, what was the basis of the claim?

9. If there was more than one claim, were the claims for the same reason? Yes:___ No:___ . If yes, what is the reason? If claim is related to a design or manufacturing problem, has the problem been corrected?

10. Does warranty require Owner's signature for proper execution? Yes_____ No_____. If yes, Can it be revised to exclude Owner's signature? Yes_____ No_____.
If the warranty cannot be revised, will the manufacturer issue a certified letter stating that the Owner's signature does not deprive the Owner of other rights, including, but not limited to, provisions under the Uniform Commercial Code and the Magnason Moss Act.
Yes_____ No_____.

11. Is the warranty pro-rated? Yes_____ No_____.

12. Are there any judgments, claims, or arbitration proceedings or suits pending against the substitute entity? Yes_____ No_____. If yes, please explain.

Foreign Manufacturer

1. Is the manufacturer of proposed item foreign owned? Yes:_____ No:_____
2. Is proposed item manufactured or assembled outside of the United States? Yes:_____ No:_____. If yes, what percentage? _____percent.
3. Is proposed item manufactured or assembled from components or materials manufactured or assembled outside of the United States? Yes:_____ No:_____. If Yes, what portion of the components or materials are manufactured or assembled outside the United States? _____ percent
4. Do you certify that the substitute product complies with the "Made In America" provisions stipulated elsewhere in the Contract Documents? Yes_____ No_____

Acknowledgements

1. Will the undersigned will pay for costs resulting in changes to the building design, including architectural and engineering design, detailing, and construction costs caused by incorporating the requested substitution or costs associated with any delays caused by deliveries of the substitute? Yes ___No _____. If no, please explain.
2. If it is determined that a substitute does not fully comply with the Contract Documents after the substitute has been accepted or installed, will the undersigned assume responsibility for all applicable costs, including removal and installation of non-conforming products, to provide one of the specified products that does comply with the specifications. Yes ___No_____ If no, please explain.
3. Is it understood and agreed to that final and ultimate approval of the substitute shall be determined at final completion of the project. Failure to provide equivalent substitutes in appearance, function, and performance to that specified, may result in the removal of the

substitute and the installation of approved product at contractor's expense. Yes_____ No_____.
If no, please explain.

Enclosed Attachments:

- 1.
- 2.
- 3.
- 4.

Certification Of Performance And Assumption Of Liability

As a manufacturer or representative of the proposed substitution, it is presumed that you are the most knowledgeable of the proposed substitution. By signing this request, you certify that all information provided in this request is accurate and true. Additionally, you certify that the product, material, component, or service being submitted as a substitute for that specified meets or exceeds the performance, function, and appearance criteria listed in the specifications and in the manufacturer's published literature, and that all information provided in this Request For Substitute, including other applicable Parts, is true and accurate. The Signee also agrees to assume all liability for the ultimate performance, function, and appearance criteria of the submitted substitute.

Person Making Request:

Name:

Signature:

Company:

Address:

Telephone No.:

No.:

Fax.

Approved substitutes and manufacturers will be released by Addendum as described in the Instructions To Bidders

For Architect's Use

Approved: _____ Approved As Noted: _____

Disapproved: _____ Because

Received Too Late: _____

Incomplete Form: _____

Insufficient/Improper Supporting Data: _____

Does Not Meet Specifications: _____

ASBESTOS FREE CERTIFICATION
For
Project Challenge Playhouse
New Storage Building & Site Improvements
Anderson School District Five
Anderson, South Carolina

This is to certify that the material furnished and/or installed by the undersigned subcontractor/vendor during the project, further described by McMillan Pazdan Smith, LLC Drawings and Specifications, contains no asbestos fibers.

Subcontractor/Vendor

Trade/Material Supplied:

Date: _____

Certified by: _____

Title: _____

MOISTURE CONTROL CERTIFICATION
For
Project Challenge Playhouse
New Storage Building & Site Improvements
Anderson School District Five
Anderson, South Carolina

This is to certify that the below listed Contractor has read, understands, and will comply with the following requirements described in this Project Manual:

1. Using the Owner's HVAC system during construction, if permitted, as described in Division 1 General Requirements.
2. A Moisture Control Meeting was conducted in accordance with Division 1 Specification – Project Meetings with responsible entities to review all applicable drawings, details, shop drawings, and manufacturer's data for conflicts, compatibility, and coordination problems during installation. Discussion topics included, but were not limited to, the following:
 1. Reviewing installation details
 2. Delivery problems
 3. Keeping materials dry
 - a. Methods
 - b. Definition of wet materials
 - c. Disposition of wet materials
 - d. Wet materials are to be removed and not installed
 4. Below grade waterproofing and backfilling
 - a. Coordination with other trades
 - b. Drain pipe
 - c. Backfill
 5. Through-wall flashing and Weeps
 - a. Location
 - b. Inspection and photos
 - c. Joints and seams
 - d. End dams
 - e. No patching
 - f. Cavity clearance and cleanliness
 6. Setting windows
 - a. End dams
 - b. Sealing
 - c. Slope and drainage
 7. Window flashing
 - a. End dams
 - b. Sealing
 - c. Slope and drainage
 8. Protecting roof membrane
 - a. Cigar/cigarette butts
 - b. Foot traffic
 - c. Coordination with other trades
 9. Climitizing the building

- 10. Installing carpentry, woodwork and casework
- 11. Installing wood, drywall, insulation, and painting

3. Date and Location of the Moisture Control Meeting:

Date:

Location:

The Contractor further certifies that all sub-contractors, including all tiers of sub-contractors and all supplies will be given copies of these requirements.

General Contractor: _____

Address: _____

Contractor's License Number: _____

By: _____

Title: _____

Date: _____

Phone Number: _____

Submit this executed Moisture Control Certification at Final Completion prior to submitting Request for Final Payment.

ADA COMPLIANCE
For
Project Challenge Playhouse
New Storage Building & Site Improvements
Anderson School District Five
Anderson, South Carolina

Relative to the above referenced project, I certify that I have read and understand the American With Disabilities Act of 1990 (ADA) provisions as they apply to this project and as stipulated in the Contract Documents and will comply with these provisions while executing the Contract Documents.

NAME OF CONTRACTOR or SUB-TIER ENTITY
ADDRESS:

TELEPHONE NO:
FAX:
E-MAIL:

Date of Certification: _____
Certified by: _____
Signature: _____
Title: _____

Submit this executed ADA Compliance to the Architect at the Pre-Construction Conference.

SECTION 01 09 50 - REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DEFINITIONS

- A. General: Basic contract definitions are included in the Conditions of the Contract.
- B. "Indicated": The term "indicated" refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the reader locate the reference. Location is not limited.
- C. "Directed": Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Architect, requested by the Architect, and similar phrases.
- D. "Approved": The term "approved," when used in conjunction with the Architect's action on the Contractor's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract.
- E. "Regulations": The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": The term "furnish" means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": The term "install" describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": The term "provide" means to furnish and install, complete and ready for the intended use.
- I. "Installer": An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
 - 1. The term "experienced," when used with the term "installer," means having a minimum of 5 continuous years previous experience immediately preceding the Contract, unless specified otherwise, with projects similar in size and scope to this Project, being familiar

with the special requirements indicated, and having complied with requirements of authorities having jurisdiction.

2. Trades: Using terms such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
3. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.
 - a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.

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

K. "Testing Agencies": A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: These Specifications are organized into Divisions and Sections based on CSI's 16-Division format and MasterFormat's numbering system.

B. Specification Content: This Specification uses certain conventions regarding the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language: Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
2. Streamlined Language: The Specifications generally use the imperative mood and streamlined language. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.
 - a. The words "shall be" are implied where a colon (:) is used within a sentence or phrase.

1.4 INDUSTRY STANDARDS

- A. **Applicability of Standards:** Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. **Publication Dates:** Comply with the standards in effect as of the date of the Contract Documents.
- C. **Conflicting Requirements:** Where compliance with 2 or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer to the Architect before proceeding for a decision on requirements that are different but apparently equal, and where it is uncertain which requirement is the most stringent.
 - 1. **Minimum Quantity or Quality Levels:** The quantity or quality level shown or specified shall be the minimum acceptable. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.
- D. **Copies of Standards:** Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - 1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.
- F. **Abbreviations and Names:** Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. The following acronyms or abbreviations, as referenced in the Contract Documents, are defined to mean the associated names. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

AA	Aluminum Association 900 19th St., NW, Suite 300 Washington, DC 20006	(202) 862-5104
AABC	Associated Air Balance Council 1518 K St., NW Washington, DC 20005	(202) 737-0202
AAMA	American Architectural Manufacturers Assoc. 1540 E. Dundee Road, Suite 310 Palatine, IL 60067	(708) 202-1350
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol St., Suite 249	

Anderson School District Five
Project Challenge Playhouse
New Storage Building & Site Improvements
Anderson, South Carolina

Project No. 015048.00

	Washington, DC 20001	(202) 624-5800
ACI	American Concrete Institute P.O. Box 19150 Detroit, MI 48219	(313) 532-2600
ACIL	American Council of Independent Laboratories 1629 K St., NW Washington, DC 20006	(202) 887-5872
ACPA	American Concrete Pipe Assoc. 8300 Boone Blvd., Suite 400 Vienna, VA 22182	(703) 821-1990
ADC	Air Diffusion Council One Illinois Center, Suite 200 111 East Wacker Dr. Chicago, IL 60601-4298	(312) 616-0800
AFPA	American Forest and Paper Assoc. (American Wood Council of the) 2nd Floor, 1250 Connecticut Ave., NW Washington, DC 20036	(202) 463-2455
AGA	American Gas Assoc. 1515 Wilson Blvd. Arlington, VA 22209	(703) 841-8400
AHAM	Association of Home Appliance Manufacturers 20 N. Wacker Dr., Suite 1500 Chicago, IL 60606	(312) 984-5800
AI	Asphalt Institute Research Park Dr. P.O. Box 14052 Lexington, KY 40512-4052	(606) 288-4960
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006	(202) 626-7300
AISC	American Institute of Steel Construction One East Wacker Dr., Suite 3100 Chicago, IL 60601-2001	(312) 670-2400
AISI	American Iron and Steel Institute 1101 17th St., NW Washington, DC 20036-4700	(202) 452-7100
AMCA	Air Movement and Control Assoc. 30 W. University Dr. Arlington Heights, IL 60004-1893	(708) 394-0150
ANSI	American National Standards Institute	

Anderson School District Five
Project Challenge Playhouse
New Storage Building & Site Improvements
Anderson, South Carolina

Project No. 015048.00

	11 West 42nd St., 13th Floor New York, NY 10036	(212) 642-4900
AOSA	Association of Official Seed Analysts California State Seed Laboratory 1220 N St. Sacramento, CA 95814	(916) 445-4521
APA	American Plywood Assoc. P.O. Box 11700 Tacoma, WA 98411	(206) 565-6600
ARI	Air-Conditioning and Refrigeration Institute 4301 Fairfax Dr., Suite 425 Arlington, VA 22203	(703) 524-8800
ARMA	Asphalt Roofing Manufacturers Assoc. 6000 Executive Dr., Suite 201 Rockville, MD 20852-3803	(301) 231-9050
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers 1791 Tullie Circle, NE Atlanta, GA 30329	(404) 636-8400
ASME	American Society of Mechanical Engineers 345 East 47th St. New York, NY 10017	(212) 705-7722
ASPE	American Society of Plumbing Engineers 3617 Thousand Oaks Blvd., Suite 210 Westlake, CA 91362	(805) 495-7120
ASTM	American Society for Testing and Materials 1916 Race St. Philadelphia, PA 19103-1187	(215) 299-5400
AWI	Architectural Woodwork Institute P.O. Box 1550 13924 Braddock Rd., No. 100 Centerville, VA 22020	(703) 222-1100
AWPA	American Wood Preservers' Assoc. P.O. Box 286 Woodstock, MD 21163-0286	(410) 465-3169
AWPB	American Wood Preservers' Bureau (This organization is now defunct.)	
AWS	American Welding Society 550 LeJeune Rd., NW Miami, FL 33126	(305) 443-9353

Anderson School District Five
Project Challenge Playhouse
New Storage Building & Site Improvements
Anderson, South Carolina

Project No. 015048.00

AWWA	American Water Works Assoc. 6666 W. Quincy Ave. Denver, CO 80235	(303) 794-7711
BHMA	Builders' Hardware Manufacturers Assoc. 355 Lexington Ave., 17th Floor New York, NY 10017	(212) 661-4261
BIA	Brick Institute of America 11490 Commerce Park Dr. Reston, VA 22091	(703) 620-0010
CAGI	Compressed Air and Gas Institute c/o Thomas Associates, Inc. 1300 Sumner Ave. Cleveland, OH 44115-2851	(216) 241-7333
CISPI	Cast Iron Soil Pipe Institute 5959 Shallowford Rd., Suite 419 Chattanooga, TN 37421	(615) 892-0137
CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Rd. Schaumburg, IL 60173	(708) 517-1200
DHI	Door and Hardware Institute 14170 Newbrook Dr. Chantilly, VA 22021-2223	(703) 222-2010
DIPRA	Ductile Iron Pipe Research Assoc. 245 Riverchase Parkway East, Suite O Birmingham, AL 35244	(205) 988-9870
DLPA	Decorative Laminate Products Assoc. 13924 Braddock Rd. Centreville, VA 22020	(800) 684-3572
EIMA	EIFS Industry Manufacturers Assoc. 2759 State Road 580, Suite 112 Clearwater, FL 34621	(813) 726-6477
FCIB	Floor Covering Installation Board 310 Holiday Ave. Dalton, GA 30720	(706) 226-5488
FGMA	Flat Glass Marketing Assoc. White Lakes Professional Bldg. 3310 S.W. Harrison St. Topeka, KS 66611-2279	(913) 266-7013
FM	Factory Mutual Systems 1151 Boston-Providence Turnpike	

Anderson School District Five
Project Challenge Playhouse
New Storage Building & Site Improvements
Anderson, South Carolina

Project No. 015048.00

	P.O. Box 9102 Norwood, MA 02062	(617) 762-4300
GA	Gypsum Association 810 First St., NE, Suite 510 Washington, DC 20002	(202) 289-5440
HEI	Heat Exchange Institute c/o Thomas Associates, Inc. 1300 Sumner Ave. Cleveland, OH 44115-2851	(216) 241-7333
HMA	Hardwood Manufacturers Assoc. 400 Penn Center Blvd. Pittsburgh, PA 15235	(412) 829-0770
IGCC	Insulating Glass Certification Council c/o ETL Testing Laboratories, Inc. P.O. Box 2040 Route 11, Industrial Park Cortland, NY 13045	(607) 753-6711
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry 127 Park St., NE Vienna, VA 22180	(703) 281-6613
NAAMM	National Association of Architectural Metal Manufacturers 600 S. Federal St., Suite 400 Chicago, IL 60605	(312) 922-6222
NAPA	National Asphalt Pavement Assoc. NAPA Building 5100 Forbes Blvd. Lanham, MD 20706-4413	(301) 731-4748
NBHA	National Builders Hardware Assoc. (Now DHI)	
NCHRP	National Cooperative Highway Research Program	
NCMA	National Concrete Masonry Assoc. 2302 Horse Pen Rd. Herndon, VA 22071-3406	(703) 713-1900
NCPI	National Clay Pipe Institute P.O. Box 759 253-80 Center St. Lake Geneva, WI 53147	(414) 248-9094
NEC	National Electrical Code (from NFPA)	

Anderson School District Five
Project Challenge Playhouse
New Storage Building & Site Improvements
Anderson, South Carolina

Project No. 015048.00

NECA	National Electrical Contractors Assoc. 3 Bethesda Metro Center, Suite 1100 Bethesda, MD 20814	(301) 657-3110
NFPA	National Fire Protection Assoc. One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101	(617) 770-3000 (800) 344-3555
NFPA	National Forest Products Assoc. (Now AFPA)	
NLGA	National Lumber Grades Authority 4400 Dominion St., Suite 103 Burnaby, BC V5G 4G3	(604) 451-7323
NRCA	National Roofing Contractors Assoc. 10255 W. Higgins Rd., Suite 600 Rosemont, IL 60018-5607	(708) 299-9070
NWMA	National Woodwork Manufacturers Assoc. (Now NWWDA)	
NWWDA	National Wood Window and Door Assoc. 1400 E. Touhy Ave., #G54 Des Plaines, IL 60018	(708) 299-5200 (800) 223-2301
PCA	Portland Cement Assoc. 5420 Old Orchard Rd. Skokie, IL 60077	(708) 966-6200
RFCI	Resilient Floor Covering Institute 966 Hungerford Dr., Suite 12-B Rockville, MD 20805	(301) 340-8580
SDI	Steel Deck Institute P.O. Box 9506 Canton, OH 44711	(216) 493-7886
SDI	Steel Door Institute 30200 Detroit Rd. Cleveland, OH 44145	(216) 889-0010
SGCC	Safety Glazing Certification Council c/o ETL Testing Laboratories Route 11, Industrial Park Cortland, NY 13045	(607) 753-6711
SIGMA	Sealed Insulating Glass Manufacturers Assoc. 401 N. Michigan Ave. Chicago, IL 60611	(312) 644-6610

SJI	Steel Joist Institute 1205 48th Avenue North, Suite A Myrtle Beach, SC 29577	(803) 449-0487
SMACNA	Sheet Metal and Air Conditioning Contractors National Assoc. 4201 Lafayette Center Dr. Chantilly, VA 22021	(703) 803-2980
SPIB	Southern Pine Inspection Bureau 4709 Scenic Highway Pensacola, FL 32504	(904) 434-2611
SSPC	Steel Structures Painting Council 4516 Henry St. Pittsburgh, PA 15213	(412) 687-1113
TIMA	Thermal Insulation Manufacturers Assoc. (This Organization is now defunct. See NAIMA)	
UL	Underwriters Laboratories 333 Pfingsten Rd. Northbrook, IL 60062	(708) 272-8800
WCLIB	West Coast Lumber Inspection Bureau P.O. Box 23145 Portland, OR 97281	(503) 639-0651
WIC	Woodwork Institute of California P.O. Box 11428 Fresno, CA 93773-1428	(209) 233-9035
WRI	Wire Reinforcement Institute 1101 Connecticut Ave. NW, Suite 700 Washington, DC 20036-4303	(202) 429-5125
WWPA	Western Wood Products Assoc. Yeon Building 522 SW 5th Ave. Portland, OR 97204-2122	(503) 224-3930
WWPA	Woven Wire Products Assoc. 2515 N. Nordica Ave. Chicago, IL 60635	(312) 637-1359

G. Federal Government Agencies: Names and titles of federal government standard- or Specification-producing agencies are often abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standard- or Specification-producing agencies of the federal government. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

Anderson School District Five
Project Challenge Playhouse
New Storage Building & Site Improvements
Anderson, South Carolina

Project No. 015048.00

CE	Corps of Engineers (U.S. Department of the Army) Chief of Engineers - Referral Washington, DC 20314	(202) 272-0660
DOC	Department of Commerce 14th St. and Constitution Ave., NW Washington, DC 20230	(202) 482-2000
DOT	Department of Transportation 400 Seventh St., SW Washington, DC 20590	(202) 366-4000
DOD	Department of Defence Washington, DC	
EPA	Environmental Protection Agency 401 M St., SW Washington, DC 20460	(202) 382-2090
FS	Federal Specification (from GSA) Specifications Unit (WFSIS) 7th and D St., SW Washington, DC 20407	(202) 708-9205
MIL	Military Standardization Documents (U.S. Department of Defense) Naval Publications and Forms Center 5801 Tabor Ave. Philadelphia, PA 19120	
OSHA	Occupational Safety and Health Administration (U.S. Department of Labor) 200 Constitution Ave., NW Washington, DC 20210	(202) 219-6091
PS	Product Standard of NBS (U.S. Department of Commerce) Government Printing Office Washington, DC 20402	(202) 783-3238
USDA	U.S. Department of Agriculture Independence Ave. between 12th St. and 14th St., SW Washington, DC 20250	(202) 720-2791

1.5 SUBMITTALS

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

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 09 50

SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

- 1. Project information.
- 2. Work covered by Contract Documents.
- 3. Access to site.
- 4. Work restrictions.
- 5. Specification and drawing conventions.
- 6. Miscellaneous provisions.

B. Related Requirements:

- 1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.

1.3 PROJECT INFORMATION

- A. Project Identification: Project Challenge Playhouse – New Storage Building & Site Improvements.

- 1. Project Location: Anderson, SC.

- B. Owner: Anderson School District 5: 400 Pearman Dairy Road, Anderson, SC 29625.

- 1. Owner's Representative: Mr. Wess Grant.

- C. Architect: McMillan Pazdan Smith architecture, 127 Dunbar Street, Spartanburg, SC 29306.

1.4 WORK COVERED BY CONTRACT DOCUMENTS

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

- 1. The project consists of the following new construction at the existing school campus:
 - a. New Storage Building (Approx. 1,500 s.f.)
 - b. Associated site work.

- B. Type of Contract:
 - 1. Project will be constructed under a single prime contract.

1.5 ACCESS TO SITE

- A. General: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- C. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Driveways, Walkways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- D. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 8:00 AM to 6:00 PM, Monday through Friday, except as otherwise indicated. Work other than normal hours shall be approved by Owner in writing in advance.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

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

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00

SECTION 01 14 00 –WORK RESTRICTIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Contractor's use of the premises.
 - 2. Owner's occupancy requirements.
 - 3. Background checks.
 - 4. Substance abuse.
 - 5. Identification.
 - 6. Record keeping for Work requirements.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.3 DEFINITIONS

- A. Contractor: Defined in AIA Document A201, General Conditions of the Contract.
- B. Subcontractor: A contractor, consultant, individual, or other entity that has its contract directly with the (primary) Contractor. Subcontractors are responsible for the implementation of the safety, health, and environmental requirements of this program for the Work to be done by their own employees as well as work done by their subcontractors. For the purposes of this program, a contractor may be either a subcontractor or sub-subcontractor or consultant.
- C. Sub-subcontractor: A contractor, sub-contractor, consultant, individual, or other entity working for a subcontractor (has other contractors under contract to perform Work on the site of this Project). They shall also be responsible for all provisions specified in this program.
- D. Owner: Defined in the Contract Documents.
- E. Architect: Defined in AIA Document A201- General Conditions of the Contract.

1.4 USE OF PREMISES

- A. General: Contractor shall have full use of premises for construction operations, including use of Project site, during construction period. Contractor's use of premises is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. General: Contractor shall have limited use of premises for construction operations as indicated on Drawings by the Contract limits.

- C. Use of Site: Limit use of premises to **areas within the Contract limits** indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
1. Limits: Confine constructions operations to Work areas indicated on the Drawings.
 - a. Unless indicated otherwise, limit site disturbance, including earthwork and clearing of vegetation, to 40 feet beyond building perimeter; 10 feet beyond surface walkways, patios, surface parking, and utilities less than 12 inches in diameter; 15 feet beyond primary roadway curbs and main utility branch trenches; and 25 feet beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities, and playing fields) that require additional staging areas in order to limit compaction in the constructed area.
 2. Owner Occupancy: Allow for Owner occupancy of Project site **and use by the public**.
 3. Driveways and Entrances: Keep driveways **parking area and loading areas**, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles. Do not use these areas for parking or storage of materials.
 - a. Coordinate with Owner and schedule deliveries to minimize use of driveways and entrances.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

1.5 OWNER'S OCCUPANCY REQUIREMENTS

- A. Full Owner Occupancy: Owner will occupy site and **adjacent** building during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits and life safety systems, unless otherwise indicated.
1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
 3. If, in the opinion of the Architect, the Contractor does not properly secure the building from the elements (water tight), the Owner maintains the right to engage a third party Industrial Hygienist to evaluate the infiltration of moisture. This Industrial Hygienist will prepare a report of corrective action necessary to prevent future mold and mildew issues. The Contractor is solely responsible for the cost of corrective action necessary, costs associated with the services of the Industrial Hygienist and additional surface or air quality testing fees that may be required to insure a safe building.
 4. Do not commence finishes, including drywall work until the building is permanently enclosed.
- B. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits and life safety systems, unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
- C. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed areas of building, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.
1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.
 2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.
 3. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of building.
 4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.

1.6 WORK RESTRICTIONS

- A. On-Site Work Hours: Coordinate the following working time with the Owner.
1. Weekend Hours:
 2. Early Morning Hours:
 3. Hours for Utility Shutdowns:
 4. Hours for **noisy activity**
 5. Morning and afternoon pick up and drop off
 6. The primary use of an occupied school facility is for the instructional programming. During periods of standardized and other major testing, pursue quiet operations that do not disturb those operations. No claims for delay will be considered for these days of quiet operation during periods of testing.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
1. Notify Owner not less than 2 days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without Owner's written permission.

1.7 BACKGROUND CHECKS

- A. Conduct criminal background investigations of individuals working on Owner's property (sites occupied with students and sites not occupied with students). The GC & Sub-Contractors shall perform regular audits of the background checks to monitor any changes that may occur.

- B. As a minimum, obtain a complete South Carolina statewide criminal background investigation, Sled Check, for individuals and employees performing Work or services for entities such as subcontractors, sub-sub-contractors, and consultants who will perform Work or a service on this Project. In the event that the individual being investigated is from out of state, broaden the investigation to include their home state, as well as the state of South Carolina as outlined above. Obtain information from a company recognized by local law enforcement agency as qualified to do so. Costs associated with these criminal background checks are the responsibility of the Contractor.
- C. The Contractor shall be responsible and liable for the conduct and actions of its employees and individuals working under it. It is incumbent upon the GC & Sub-Contractors to perform a responsible review of the background checks of all workers on site & to use reasonable judgment when assigning workers to the project with consideration of the best interest of the owner.
- D. An individual with the following criminal convictions or pending charges will not be permitted on the Owner's Project or property.
 - 1. Rape
 - 2. Child Molestation or Abuse
 - 3. Sexually Oriented Crime
 - 4. Drugs: Felony use, possession or distribution.
- E. Violent criminal convictions shall be reviewed by the GC & Sub-Contractors on a case by case basis. The GC shall notify the owner of any workers with violent crime convictions or any other unusual convictions prior to the individual starting work on site.
- F. The Owner may, at any time, request verification of the criminal background investigation for an employee or subcontractor on the Owner's property.

1.8 SUBSTANCE ABUSE

- A. The use of tobacco products on the Owner's campus is prohibited. Workers will be asked to leave the site for the balance of the day on their first offense. Workers will be asked to permanently leave the site after the second offense.
 - 1. Remind employees that remaining "drug/alcohol-free" is a condition of employment for this Project. Alcohol and illegal drug use pose a serious threat to workplace safety and health.
 - 2. Implement and enforce a Drug and Alcohol Free Workplace Substance Abuse Program for personnel on this Project. This includes, but is not limited to, educating employees on the Project on the requirements of the Drug Free Workplace Program for this Project. Maintain copies of this program on site for review by the Owner.
 - 3. As a minimum, the program shall include the following:
 - a. The use, possession, sale, transfer, acceptance, or purchase of illegal drugs and controlled substances is prohibited except prescription medications, legally prescribed by a physician. The use, possession of an open container, personal sale, transfer or acceptance of alcohol on the construction Project property or while performing business is strictly prohibited. Violation of this policy will be grounds for immediate termination and may result in a report to the appropriate law enforcement authorities.

- b. Prescription drugs shall not be used by any person other than the individual to whom it is prescribed. Such substances or non-prescription (over-the-counter) drugs shall be used only as prescribed or indicated. Employees shall be removed from the Project if the side effects of prescription drugs adversely affect the safe completion of their Work activity. Encourage employees to discuss with their supervisor and physician effects of medication that could adversely affect their safety or the safety of others on the Project.
- c. Employees of Contractors may be tested for substance abuse when involved in an incident that results in injury to them or cause injury to another employee or damage to property. A decision to test an individual for substance abuse following an incident will be based on an objective evaluation of observable signs of substance abuse regarding an individual's behavior, appearance, speech or body odor. This decision will be made by or in conjunction with a medical professional or other individual with the knowledge to recognize the signs of substance abuse.
- d. Employees who fail a drug or alcohol test shall not be allowed to Work on this Project or enter the Owner's property for 60 days.
- e. Implement a drug-free work place program.

B. Contractor Employee Testing Requirements

- 1. Construction entities are responsible for pre-employment drug testing of employees hired after they are awarded a contract. File an affidavit that pre-employment drug testing has been done per the minimum requirements below. The affidavit must indicate the name of the employee and be signed by an official of the Contractor.
 - a. Minimum pre-employment drug testing requirements: Personnel hired subsequent to the Contractor being awarded a contract must have verification of successfully passing a pre-employment drug test within thirty calendar days of being allowed on site. (Note the term "Contractor" here refers to both the Contractor and Sub-Subcontractors).
 - b. The drug screening protocol must be at least a 5-panel screen, per NIDA specifications. An initial positive test must be confirmed by a second test using gas chromatography and mass spectrometry (GCMS) methodology or some other method determined by the SC Department of Health and Human Services to be just as reliable.
 - c. The protocols for specimen collection, the specimen custody of control, and the analysis techniques must be acceptable to the Project Safety Director.
 - d. The cost associated with pre-employment and post-accident drug testing shall be the responsibility of the Contractor. The Contractor may arrange local testing with nearest medical facility, mobile testing van, or other recognized testing means that apply.
 - e. Employees must be drug and alcohol free prior to commencing work on the job-site. This includes employees who may only be on site for one day; the only exceptions are the Owner's personnel, employees of governmental regulatory agencies, escorted visitors (an escorted visitor is a person with no job responsibilities who is anticipated to be on the job-site for less than three hours and who is accompanied by authorized job-site personnel), or Owner's consultants, vendors, material-men, waste haulers, suppliers (or their drivers including while engaged in unloading).
- 2. Post Incident / Post Accident Testing: Implement a post incident / post accident substance abuse testing program on this Project; testing is triggered by any of the following significant incidents:

- a. Incident with the potential for, or actual property damage or death as a result of the operation of equipment,
 - b. Employee injured in an accident that requires medical treatment other than first-aid,
 - c. When an employee's actions have contributed substantially in an accident,
 - d. Near accident to another employee or the public, or
 - e. Accident resulting in an OSHA-recordable injury or illness, or property damage.
 - f. The cost associated with post accident testing shall be the responsibility of the Contractor employing this person.
3. Reasonable Suspicion Testing:
- a. Person on the site suspected of being under the influence of controlled substances is subject to reasonable suspicion testing.
 - b. Reasonable Suspicion is determined by specific observations concerning the employee's appearance, inappropriate behavior, speech, body odor or performance problems or where there is other evidence to support the suspicion.
 - c. Observations for controlled substances testing purposes may include indications of chronic or withdrawal effects of such substances.
 - d. Necessary observation to trigger reasonable suspicion testing will be made only by a trained supervisor [contractor management]. Under no circumstances will the same supervisor be involved in the testing process.
 - e. Determination of "Reasonable Suspicion" can only be made by an individual qualified to identify reasonable suspicion as related to substance abuse.
 - f. Contractor's Drug and Alcohol Free Workplace Substance Abuse Program shall include a provision that requires an employee to submit to a test if there is reasonable suspicion or belief that he/she is using drugs or alcohol that may be impairing his/her safe job performance.
 - g. Cost associated with the implementation of a Reasonable Suspicion Test shall be the responsibility of the Contractor employing this employee.
4. Random: The Substance Abuse program must include a provision for random sampling of persons employed by contractors and subcontractors. Positive test results must be provided in writing to the Project in writing to the Project Safety Director.
- C. Employee Training
1. Train new and existing employees in the requirements of the substance abuse program/policy and periodically retrain to ensure compliance. Document this training.
- 1.9 IDENTIFICATION
- A. Contractor Employee Identification:
1. Provide a picture identification badge for each employee who successfully passes a background check and substance abuse test and who will be working on this Project. These identification badges shall be worn in plain view while on the Project site or Owner's property. Employees without a proper identification badge will be escorted off the Project site or Owner's property. Costs of providing identification badges shall be the responsibility of the Contractor. As a minimum, the identification badges shall be computer produced and consist of the following information in a large, easily visible and legible font:

- a. Full Name
- b. Nickname
- c. Current color photo
- d. Name of Employer
- e. Date of issue

B. Guest/Visitor Identification:

1. Identification Badges: Provide numbered temporary identification badges for authorized and approved visitors and guests. On arrival, give the guest or visitor a badge to be worn in plain view while on the Project site or Owner's property. Persons without a proper identification badge will be escorted off the Project site or Owner's property. Costs of providing these identification badges shall be the responsibility of the Contractor. As a minimum, the identification badges shall be computer produced and consist of the following information:
 - a. Guest/Visitor
 - b. Badge number
 - c. Contractor's name
 - d. Project name
 - e. Date produced
2. Guest/Visitor Log: Maintain a daily guest/visitor log that shall contain an entry for each non-employee who enters the site. Do not permit guest/visitors to enter the Project site or Owner's property without providing the information requested in the log. As a minimum, record the following information for each log entry:
 - a. Entry number
 - b. Date of arrival
 - c. Time of arrival
 - d. Badge number
 - e. Guest/visitor's full name
 - f. Employer's name
 - g. Vehicle description
 - h. Vehicle license number
 - i. Reason for visit

1.10 UNDOCUMENTED EMPLOYEES/WORKERS

- A. By entering into a Contract Agreement with the Owner to perform the work indicated in or required by the Contract Documents for this Project, the Contractor certifies that full and complete compliance with the applicable requirements of Title 8, Chapter 14 of the South Carolina Code of Laws, including the following additional provisions stated herein under this Article of the specifications, will be maintained throughout the Contract period.
- B. The Contractor further agrees to provide, to the Owner, upon request, any documentation, required or requested, including, but not limited to, E-verification, to establish that you and your subcontractors and sub-subcontractors are in compliance with Title 8, Chapter 14. Pursuant to Section 8-14-60, "A person who knowingly makes or files any false, fictitious, or fraudulent documents, statements, or reports pursuant to this chapter is guilty of a felony, and, upon conviction, shall be fined within the discretion of the court or imprisoned for not more than five years, or both."

- C. The Contractor also agrees to include, in any contracts with your subcontractors, language requiring your subcontractors to comply with the applicable requirements of this Article of the specifications and for these sub-contractors to include the provisions of this Article of the specifications in their contracts with their sub-subcontractors.
- D. This Article of the specifications applies to the Contractor, the Contractor's sub-contractors and their sub-contractors including all sub levels of sub-contractors regardless of the number of employees and shall be applicable to each person who is employed directly or indirectly by or controlled by the Contractor and who performs any type of work on this project and receives any type of compensation, either directly or indirectly from the Contractor, for the work performed on this Project. Throughout the duration of this Contract, the Owner reserves the right to require the Contractor to provide proof of compliance with these provisions of the specifications for any single or all applicable previously defined employees.
- E. If the Contractor believes that he or his sub-contractors should be exempted from the provisions of this Article of the specifications, then that Contractor shall submit a full written explanation, including supporting documentation and proof, to the Owner. This documentation must be submitted within five (5) days after receipt of bids. Requests for exemption will not be accepted or considered after Contract Execution.

1.11 RECORD KEEPING

- A. In addition to other documentation required to be maintained at the jobsite by the Contract Documents, maintain a master or central file for documentation related to substance abuse program for sub-contractors, sub-sub-contractors, consultants, and visitors, on the jobsite. Maintain files in such a manner that distinguishes each contractor and their sub-contractors, sub-sub-contractors, consultants, and visitors from other contractors and their subcontractors.
- B. Maintain the following documentation in the safety files:
 - 1. Results of drug testing.
 - 2. Results of background tests.
 - 3. Visitor log, showing date and time of arrival and departure, and purpose of visit.
- C. The Owner and its designated Representatives shall have the right to review documentation at any time upon request. Cooperate with these reviews.

1.12 CONTRACTOR CONDUCT

- A. The Contractor shall acknowledge and respect the Owner's working environment.
- B. To the greatest extent possible, no one shall interact with any member of the staff or student body.
- C. Abusive or offensive language, or gestures, in dealing with members of the student body, faculty, staff, or visitors to the campus or project site, is unacceptable behavior and will not be tolerated. No one shall make sexually suggestive comments or gestures to anyone on or near (passer-by) this job site. Sexual harassment in any form, whether verbal, visual, physical, or emotional, which is threatening or harmful, both physically or mentally, to a second party of another gender or same gender; or so perceived by a third party is unacceptable and will result in immediate termination.

- D. All personnel shall be fully dressed at all times including but not limited to shoes, socks, pants and at least a full "T" shirt. Tank tops are not allowed. No article of clothing shall display any graphic that may be construed as obscene, distasteful, or disrespectful.
- E. No one shall use profane language.
- F. No one may consume food or drinks anywhere within the project site except in designated approved areas; smoking is not permitted on the project site.
- G. Certain areas of the building/site complex not under this renovation shall be off limits to all workers.
- H. The Owner reserves the right to recommend removal or termination of any one who violates these conditions.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 14 00

SECTION 01 21 00 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
 - 1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to the Contractor. If necessary, additional requirements will be issued by Change Order.
- B. Types of allowances include the following:
 - 1. Lump Sum allowances.

1.3 SELECTION AND PURCHASE

- A. Within 30 days of date established for the Notice to Proceed, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.4 SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.
- B. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- C. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

- D. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.6 ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.7 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.

1.8 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.

- C. Change Orders authorizing use of funds from the contingency allowance shall include Contractor's related costs and reasonable overhead and profit margins.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

A. GENERAL ALLOWANCE NOTES:

1. Monies not used in these lump sum allowances described below shall be credited back to the owner at the completion of the project.
2. For some allowances, the Owner or Architect will receive proposals from outside subcontractors and shall assign the contract of the successful bidder to the General Contractor for administration and coordination.

- B. **Allowance No. 1 – Site Allowance:** Include the sum of \$20,000 to be used as directed by the School District and the Architect for re-routing any unknown site utilities in the area of work, replacement of damaged curb and gutter, seal coating at end of project, and other miscellaneous site work unknowns.

- C. **Allowance No. 2 – Landscape Allowance:** Include the sum of \$3,000 for landscaping materials and labor.

- D. **Allowance No. 3 – Signage Allowance:** Include the sum of \$25,000 for the purchase of exterior site signage & building signage (re: spec section 10 14 23). Installation is in the base bid, not in the allowance. Exterior Site Signage is not attached to the building. Dimensional Letter Signage (attached to building), as shown in drawings and spec section 10 14 19, shall be included in base bid.

- E. **Allowance No. 5 – Hardware Allowance:** Contractor shall include in his Base Bid a lump sum of \$ 50,000 for the purchase of all door hardware, including taxes. Installation shall not be included in allowance but shall be included in Base Bid. Refer to Division 09 Section 08 71 00 – Door Hardware. General Contractor shall verify quantity with Architect.

- F. **Allowance No. 6 – Contingency Allowance:** Include the sum of \$ 25,000 in the base bid for a Contingency Allowance. Transfer monies not used in the lump and unit allowances described in paragraph 3.3 to this Contingency Allowance. Items charged to the Contingency Allowance shall not be included in or considered for the General Contractor's overhead and profit. For allowances listed, the Architect or Owner will solicit proposals from outside subcontractors and will assign the contract of the successful bidder to the General Contractor for administration and coordination.

For allowances 1, 2, 3, 4, & 5 the Architect/Owner will receive proposals from outside subcontractors and shall assign the contract of the successful bidder to the General Contractor for administration and coordination.

END OF SECTION 01 21 00

SECTION 01 22 00 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
 - 2. Section 014000 "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

- A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

- A. Unit Price No. 1: Rock excavation, trenching.
 - 1. Description: Classified rock excavation and trenching.
 - 2. Unit of Measurement: Cubic yard.

- B. Unit Price No. 2: Rock excavation, open areas.
 - 1. Description: Classified rock excavation in open areas.
 - 2. Unit of Measurement: Cubic yard.

- C. Unit Price No. 3 - Removal of unsatisfactory soil and replacement with satisfactory soil material:
 - 1. Description: Unsatisfactory soil excavation and disposal off site and replacement with satisfactory fill material or engineered fill from off site, as required, according to Section 312000 "Earth Moving."
 - 2. Unit of Measurement: Cubic yard.

- D. Unit Price No. 4 – Excavation cut and fill:
 - 1. Description: Excavation cut and fill on site, including compaction, according to Section 312000 "Earth Moving."
 - 2. Unit of Measurement: Cubic yard.

- E. Unit Price No. 5 – Respread topsoil:
 - 1. Description: Respread topsoil, according to Section 31 20 00 "Earthwork."
 - 2. Unit of Measurement: Cubic yard.

END OF SECTION 01 22 00

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

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

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request or 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail."

- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Include costs of labor and supervision directly attributable to the change.
 - 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - 6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
 - 7. Proposal Request Form: Use CSI Form 13.6A, "Change Order Request (Proposal)," with attachments CSI Form 13.6D, "Proposal Worksheet Summary," and Form 13.6C, "Proposal Worksheet Detail."

1.5 ADMINISTRATIVE CHANGE ORDERS

- A. Allowance Adjustment: See Section 01 21 00 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
- B. Unit-Price Adjustment: See Section 01 22 00 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.

1.6 CHANGE ORDER PROCEDURES

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

1.7 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 26 00

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 2. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

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

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
2. Arrange schedule of values consistent with format of AIA Document G703.
3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of the Contract Sum.
 - a. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
9. Purchase Contracts: Provide a separate line item in the schedule of values for each purchase contract. Show line-item value of purchase contract. Indicate owner payments or deposits, if any, and balance to be paid by Contractor.
10. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

- a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
11. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Forms: Use AIA Document G702 and AIA Document G703 Continuation Sheets as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the Schedule of Values and Contractor's Construction Schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit 3 signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by application who is lawfully entitled to a lien.

5. Waiver Forms: Submit waivers of lien on forms, executed in a manner acceptable to Owner.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of Values.
 3. Contractor's Construction Schedule (preliminary if not final).
 4. Products list.
 5. Schedule of unit prices.
 6. Submittals Schedule (preliminary if not final).
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.
 9. Copies of building permits.
 10. Copies of authorizations and licenses from authorities having jurisdiction for performance of Work.
 11. Initial progress report.
 12. Report of preconstruction conference.
 13. Certificates of insurance and insurance policies.
 14. Performance and payment bonds.
 15. Data needed to acquire Owner's insurance.
 16. Initial settlement survey and damage report if required.
- H. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- I. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 6. AIA Document G707, "Consent of Surety to Final Payment."
 7. Evidence that claims have been settled.
 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 9. Final, liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 00

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Requests for Information (RFIs).
 - 3. Project meetings.
- B. Related Requirements:
 - 1. Section 013200 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Section 017700 "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and e-mail addresses.

1.5 GENERAL COORDINATION PROCEDURES

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

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

- C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

- D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Project closeout activities.
 - 8. Startup and adjustment of systems.

1.6 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Architect.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: AIA Document G716 or software-generated form with substantially the same content as indicated above, acceptable to Architect.
1. Attachments shall be electronic files in Adobe Acrobat PDF format.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.

parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Critical work sequencing and long-lead items.
 - c. Designation of key personnel and their duties.
 - d. Lines of communications.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for RFIs.
 - g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.
 - k. Preparation of record documents.
 - l. Use of the premises and existing building.
 - m. Work restrictions.
 - n. Working hours.
 - o. Owner's occupancy requirements.
 - p. Responsibility for temporary facilities and controls.
 - q. Procedures for moisture and mold control.
 - r. Procedures for disruptions and shutdowns.
 - s. Construction waste management and recycling.
 - t. Parking availability.
 - u. Office, work, and storage areas.
 - v. Equipment deliveries and priorities.
 - w. First aid.
 - x. Security.
 - y. Progress cleaning.
 4. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Progress Meetings: Conduct progress meetings at biweekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.

- b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.

- 4. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 31 19 - PROJECT MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for project meetings including, but not limited to, the following:
 - 1. Preconstruction conferences.
 - 2. Preinstallation conferences.
 - 3. Moisture coordination meeting.
 - 4. Ceiling coordination meeting.
 - 5. Project meetings.
- B. Related Sections include the following:
 - 1. Division 01 Section "Project Management & Coordination" for a description of the division of Work among separate contracts and responsibility for coordination activities not in this Section, for preparing and submitting Contractor's construction schedule.
 - 2. Division 01 Section "Submittal Procedures" for procedures for submitting the Contractor's construction schedule.
- C. The following sections specify requirements for a preinstallation conference:
 - 1. Division 03 Section "Cast-In-Place Concrete".
 - 2. Division 04 Section "Unit Masonry"
 - 3. Division 07 Section "Firestopping"
 - 4. Division 07 Section "Metal Roof Panels"
 - 5. Division 07 Section "Metal Wall Panels"
 - 6. Division 08 Section "Aluminum-Framed Entrances and Storefronts"
 - 7. Division 08 Section "Door Hardware"
 - 8. Division 09 Section "Gypsum Board Assemblies"
 - 9. Division 09 Section "Acoustical Tile Ceilings"
 - 10. Division 09 Section "Carpet"
 - 11. Division 09 Section "Painting"
 - 12. Division 13 Section "Metal Building Systems"
 - 13. Division 31 Section "Termite Control"
 - 14. Division 32 Section "Grassing"

1.3 PROJECT MEETINGS

- A. General: Schedule and conduct weekly meetings and conferences at Project site, unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to invited attendees.
 3. Minutes: Have an experienced note-taker record and type complete and accurate meeting minutes for scheduled and unscheduled meetings that pertain to the Project, regardless of who called or scheduled the meeting. Record significant discussions and agreements achieved. Organize the minutes of the proceedings in chronological order. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within 72 hours of the meeting.
 4. Minutes shall include, but are not limited to the items listed below.
 - a. Convening time, date, and place
 - b. Attendees
 - c. Discussion topics and how initiated
 - d. Action items and person responsible for item
 - e. Key events
 - f. Decisions made and by whom
 - g. Unresolved issues and disposition of those issues

1.4 PRECONSTRUCTION CONFERENCE

- A. Schedule a preconstruction conference before starting construction, at a time convenient to Owner, and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for RFIs.
 - g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.
 - k. Preparation of Record Documents.
 - l. Use of the premises and existing building.
 - m. Work restrictions.

- n. Owner's occupancy requirements.
- o. Responsibility for temporary facilities and controls.
- p. Construction waste management and recycling.
- q. Parking availability.
- r. Office, work, and storage areas.
- s. Equipment deliveries and priorities.
- t. First aid.
- u. Security.
- v. Progress cleaning.
- w. Working hours.

- 3. Minutes: Record and distribute meeting minutes.

1.5 PREINSTALLATION CONFERENCES

- A. Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
 - 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. The Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility problems.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written requirements and recommendations.
 - n. Project Specifications.
 - o. Documentation requirements.
 - p. Warranty requirements.
 - q. Compatibility of materials.
 - r. Acceptability of substrates.
 - s. Temporary facilities and controls.
 - t. Space and access limitations.
 - u. Regulations of authorities having jurisdiction.
 - v. Testing and inspecting requirements.
 - w. Installation procedures.
 - x. Coordination with other work.
 - y. Required performance results.
 - z. Protection of adjacent work.
 - aa. Protection of construction and personnel.

3. Have an experienced person record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
5. Remind the manufacturer's representative of provisions in the Contract Documents that require him/her to inspect not only for compliance with the manufacturer's requirements but also compliance with the Specifications when Specifications are more stringent. Inspection reports shall include deviations from both manufacturer's requirements and the Specifications. Provide the Manufacturer's representative with a copy of the Project Specifications including Addenda.
6. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
7. A sample agenda with discussion topics for a pre-roofing conference is included at the end of this section.

1.6 PROGRESS MEETINGS:

- A. Conduct progress meetings at monthly (minimum) intervals. Coordinate dates of meetings with preparation of payment requests. Notify the Owner and the Architect of scheduled meeting dates.
 1. Attendees: In addition to representatives of Owner and Architect, each Contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion related to status of Project.
 - a. Contractor's construction schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Work hours.

- 10) Hazards and risks.
 - 11) Progress cleaning.
 - 12) Quality and work standards.
 - 13) Status of correction of deficient items.
 - 14) Field observations.
 - 15) RFIs.
 - 16) Status of proposal requests.
 - 17) Pending changes.
 - 18) Status of Change Orders.
 - 19) Pending claims and disputes.
 - 20) Documentation of information for payment requests.
 - 21) Safety.
 - 22) Security.
3. Minutes: Record the meeting minutes.
 4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
- B. Coordination Meetings: Conduct Project coordination meetings at regular intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and preinstallation conferences.
1. Attendees: In addition to representatives of Owner and Architect, each Contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion related to status of Project.
 - a. Combined Contractor's construction schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to Combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - b. Schedule Updating: Revise Combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
 - c. Safety Issues.
 - d. Review present and future needs of each contractor present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.

- 5) Off-site fabrication.
- 6) Access.
- 7) Site utilization.
- 8) Temporary facilities and controls.
- 9) Work hours.
- 10) Hazards and risks.
- 11) Progress cleaning.
- 12) Quality and work standards.
- 13) Change Orders.

3. Reporting: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 19

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's construction schedule.
 - 2. Daily construction reports.
 - 3. Field condition reports.
 - 4. Special reports.
- B. Related Sections:
 - 1. Division 01 Section "Submittal Procedures" for submitting schedules and reports.
 - 2. Division 01 Section "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. PDF electronic file.
- B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

- C. Daily Construction Reports: Submit at weekly intervals.
- D. Field Condition Reports: Submit at time of discovery of differing conditions.
- E. Special Reports: Submit at time of unusual event.

1.5 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.
- B. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Substantial Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type, Contractor's construction schedule within 30 days of date established for the Notice to Proceed.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. List of separate contractors at Project site.

3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (refer to special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial completions and occupancies.
19. Substantial Completions authorized.

- B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.4 SPECIAL REPORTS

- A. General: Submit special reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.
- B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue updated schedule by noon the day before the next regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate final completion percentage for each activity.

- B. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01 32 00

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 012900 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 - 2. Section 013200 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 3. Section 017823 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 4. Section 017700 "Closeout Procedures" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."
- B. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.
 - 1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
 - 2. Submittal: Submit concurrently with startup construction schedule. **All submittals shall be received within the first 60 days of construction.** List those submittals required to

maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.

3. Format: Arrange the following information in a tabular format:
 - a. Scheduled date for first submittal.
 - b. Specification Section number and title.
 - c. Submittal category: Action; informational.
 - d. Name of subcontractor.
 - e. Description of the Work covered.
 - f. Scheduled date for Architect's final release or approval.
 - g. Scheduled dates for installation.
 - h. Activity or event number.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. General: Electronic copies of CAD Drawings of the Contract Drawings may be provided by Architect for Contractor's use in preparing submittals. Floor plans and RCPs will be provided at no charge. **For all other drawings, there will be a processing fee of \$150 per sheet per request.** Prior to release of CAD drawings, the processing fee shall be paid and a drawing release will need to be signed and submitted.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
 3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 4. **In the event that submittal must be reviewed a third time, the Contractor must reimburse the Architect or Architect's consultants at a flat fee of \$500, in advance of the review.**

- D. Electronic Submittals: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., WTSH-061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., WTSH-061000.01.A).
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Architect.
 4. Transmittal Form for Electronic Submittals: Use software-generated form from electronic project management software acceptable to Owner, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Contractor.
 - e. Name of firm or entity that prepared submittal.
 - f. Names of subcontractor, manufacturer, and supplier.
 - g. Category and type of submittal.
 - h. Specification Section number and title.
 - i. Specification paragraph number or drawing designation and generic name for each of multiple items.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Related physical samples submitted directly.
 - m. Indication of full or partial submittal.
 - n. Transmittal number.
 - o. Remarks.
- E. Options: Identify options requiring selection by Architect.
- F. Deviations and Additional Information: On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- G. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.
 4. **Resubmittals shall include cover letter with written responses to corrections and remarks noted in original submittal.**

- H. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- I. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
 - 1. Submit electronic submittals as PDF electronic files.
 - a. Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
 - 2. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically submitted certificates and certifications where indicated.
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
 - 1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 - 2. Mark each copy of each submittal to show which products and options are applicable.
 - 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 30 by 42 inches.
 3. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 - e. Specification paragraph number and generic name of each item.
 3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

- a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.
6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
- a. Number of Samples: Submit two sets of Samples. Architect will retain one Sample sets; remainder will be returned.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three sets of paired units that show approximate limits of variations.
- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
 2. Manufacturer and product name, and model number if applicable.
 3. Number and name of room or space.
 4. Location within room or space.
 5. Submit product schedule in the following format:
 - a. PDF electronic file.
 - b. Mark up and retain one returned copy as a Project Record Document.
- F. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."
- G. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."
- H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
- I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."
- J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."

- K. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."
- L. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- M. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- N. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- O. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- P. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- Q. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 017700 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

- A. Action Submittals: Architect will review each submittal, make marks to indicate corrections or revisions required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.
- C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may be returned by the Architect without action.

END OF SECTION 01 33 00

Anderson School District Five
Project Challenge Playhouse
New Storage Building & Site Improvements
Anderson, South Carolina

Project No. 015048.00

Date: February 30, 2016

Reference: CADD / Electronic File Transfer to Contractor

Project Number: 015048.00

Project Name: Project Challenge Playhouse New Storage Building & Site Improvements

Dear General Contractor Contact:

At your request, we will provide electronic files for your convenience and use in the preparation of shop drawings related to the referenced project, subject to the following terms and conditions:

Our electronic files are compatible with: *AutoCAD 2014*. We make no representation as to the compatibility of these files with your hardware or your software beyond the specified release of the referenced specifications.

Data contained on these electronic files are part of our instruments of service and shall not be used by you or anyone else receiving these data through or from you for any purpose other than as a convenience in the preparation of shop drawings for the referenced project. Any other use or reuse by you or by others will be at your sole risk and without liability or legal exposure to us. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against us, our officers, directors, employees, agents or sub-consultants that may arise out of or in connection with your use of the electronic files.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold us harmless against all damages, liabilities or costs, include reasonable attorneys' fees and defense costs, arising out of or resulting from your use of these electronic files.

These electronic files are not construction documents. Differences may exist between these electronic files and corresponding hard-copy construction documents. We make no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed or sealed hard-copy construction documents prepared by us and the electronic files, the signed and sealed hard-copy construction documents shall govern. You are responsible for determining if any conflict exists by your use of these electronic files, you are not relieved of your duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.

Because information presented on the electronic files can be modified, unintentionally or otherwise, we reserve the right to remove all indicia of ownership and /or involvement from each electronic display.

Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by us, and we make no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall we be liable for any loss of project or any consequential damages as a result of your use or reuse of these electronic files.

po box 5331 spartanburg, sc 29304
o. 864 585 5678 f. 864 542 9451

mcmillanpazdansmith.com

Anderson School District Five
Project Challenge Playhouse
New Storage Building & Site Improvements
Anderson, South Carolina

Project No. 015048.00

All terms and conditions above are hereby agreed and accepted in their entirety as a condition of receipt of the electronic file.

(Contractor name and address)

Signature / Title _____

Date _____

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

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

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.
- C. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- D. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

- E. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- F. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).
- G. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

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

1.5 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Entity responsible for performing tests and inspections.
 - 3. Description of test and inspection.
 - 4. Identification of applicable standards.
 - 5. Identification of test and inspection methods.
 - 6. Number of tests and inspections required.
 - 7. Time schedule or time span for tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.

1.6 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities. Coordinate with Contractor's construction schedule.
- B. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- C. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 - 1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.

1.7 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, and telephone number of technical representative making report.
 - 2. Statement on condition of substrates and their acceptability for installation of product.
 - 3. Statement that products at Project site comply with requirements.
 - 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 6. Statement whether conditions, products, and installation will affect warranty.
 - 7. Other required items indicated in individual Specification Sections.

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

1.8 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to **ASTM E 329** and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- G. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.9 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
 2. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- D. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- E. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- F. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses.
1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
1. Date test or inspection was conducted.
 2. Description of the Work tested or inspected.
 3. Date test or inspection results were transmitted to Architect.
 4. Identification of testing agency or special inspector conducting test or inspection.

- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Owner will pay sewer-service use charges for sewer usage by all entities for construction operations.
- C. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
- D. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel. Show coordination with other construction activities taking place on site concurrently.
- B. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage, including delivery, handling, and storage provisions for materials subject to water absorption or water damage, discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water damaged Work.
- C. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time

frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Coordinate with SCDHEC requirements. Include the following:

1. Locations of dust-control partitions at each phase of work.
2. HVAC system isolation schematic drawing.
3. Location of proposed air-filtration system discharge.
4. Waste handling procedures.
5. Other dust-control measures.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- B. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.
 1. Store combustible materials apart from building.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return air grille in system and remove at end of construction and clean HVAC system as required in Division 01 Section "Closeout Procedures".
- C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 - 1. Locate facilities to limit site disturbance as specified in Division 01 Section "Summary."
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1. Toilets: Use of Owner's existing toilet facilities will be not permitted.
 - E. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.
 - F. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
 - G. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.
 1. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 2. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
 - H. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
 1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
 - I. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 1. Connect temporary service to Owner's existing power source, as directed by Owner.
 - J. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
 - K. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel. Install one telephone line(s) for each field office.
 1. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.
 - L. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Architect and Owner to access project electronic documents and maintain electronic communications.
- 3.3 SUPPORT FACILITIES INSTALLATION
- A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
 2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Parking: Provide temporary parking areas for construction personnel.
- C. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties nor endanger permanent Work or temporary facilities.
 2. Remove snow and ice as required to minimize accumulations.
- D. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- 3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION
- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
1. Comply with work restrictions specified in Division 01 Section "Summary."
- B. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.
- C. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each work day.
- D. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- E. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
- F. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.

- G. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
 - 1. Construct dustproof partitions with polyethylene with joints taped.
 - 2. Provide walk-off mats at each entrance through temporary partition.
- H. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
 - 1. Prohibit smoking in construction areas.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

1.3 SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: CSI Form 13.1A.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified material or product cannot be provided.
 - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
 - i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided

within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.

- j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 3 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 10 days of receipt of request, or 5 days of receipt of additional information or documentation, whichever is later.
- a. Form of Acceptance: Change Order.
 - b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.
 - 3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Store cementitious products and materials on elevated platforms.
 - 5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 - 6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 7. Protect stored products from damage and liquids from freezing.

1.5 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
 - 1. **Manufacturer's Warranty:** Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 - 2. **Special Warranty:** Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.
- B. **Special Warranties:** Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.
 - 1. **Manufacturer's Standard Form:** Modified to include Project-specific information and properly executed.
 - 2. Refer to Divisions 02 through 50 Sections for specific content requirements and particular requirements for submitting special warranties.
- C. **Submittal Time:** Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. **General Product Requirements:** Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. **Standard Products:** If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Architect will make selection.
 - 5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
- B. **Product Selection Procedures:**
 - 1. **Product:** Where Specifications name a single product and manufacturer, provide the named product that complies with requirements.

2. Manufacturer: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements.
3. Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.
4. Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.
5. Basis-of-Design Product: Where Specifications name a product and include a list of manufacturers, provide the specified product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named.

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Architect will consider requests for substitution if received within 60 days after commencement of the Work. Requests received after that time may be considered or rejected at discretion of Architect.
- B. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 2. Requested substitution does not require extensive revisions to the Contract Documents.
 3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 4. Substitution request is fully documented and properly submitted.
 5. Requested substitution will not adversely affect Contractor's Construction Schedule.
 6. Requested substitution has received necessary approvals of authorities having jurisdiction.
 7. Requested substitution is compatible with other portions of the Work.
 8. Requested substitution has been coordinated with other portions of the Work.
 9. Requested substitution provides specified warranty.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Installation of the Work.
 - 3. Cutting and patching.
 - 4. Coordination of Owner-installed products.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.
 - 8. Correction of the Work.
- B. Related Requirements:
 - 1. Section 011000 "Summary" for limits on use of Project site.
 - 2. Section 013300 "Submittal Procedures" for submitting surveys.
 - 3. Section 017700 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

1.3 DEFINITIONS

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

1.4 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut

- and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Mechanical systems piping and ducts.
 - f. Control systems.
 - g. Communication systems.
 - h. Fire-detection and -alarm systems.
 - i. Conveying systems.
 - j. Electrical wiring systems.
 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- B. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.
 - C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.
- 1.5 WARRANTY
- A. Existing Warranties: Remove, replace, patch and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranty.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
 - 1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with requirements in Division 1 sustainable design requirements Section.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work.
2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

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

- D. **Building Lines and Levels:** Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. **Record Log:** Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 INSTALLATION

- A. **General:** Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. **Tools and Equipment:** Do not use tools or equipment that produce harmful noise levels.
- G. **Templates:** Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. **Attachment:** Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. **Mounting Heights:** Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and

items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.5 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Temporary Support: Provide temporary support of work to be cut.
- C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- D. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 011000 "Summary."
- E. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 5. Proceed with patching after construction operations requiring cutting are complete.
- G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.

H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.6 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.

3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

- a. Use containers intended for holding waste materials of type to be stored.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

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

END OF SECTION 01 73 00

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Sections include the following:
 - 1. Division 01 Section "Execution" for progress cleaning requirements.
 - 2. Division 04 Sections "Unit Masonry" for disposal requirements for masonry and stone waste.
 - 3. Division 31 Section "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 PERFORMANCE REQUIREMENTS

A. General: Develop waste management plan that results in end-of-Project rates for salvage/recycling of minimum 75 percent by weight of total waste generated by the Work.

B. Salvage/Recycle Requirements: Owner's goal is to salvage and recycle as much nonhazardous demolition and construction waste as possible including the following materials:

1. Demolition Waste Examples :

- a. Asphaltic concrete paving.
- b. Concrete and reinforcing steel.
- c. Brick and concrete masonry units.
- d. Wood studs and joists, paneling and trim
- e. Plywood and oriented strand board.
- f. Structural and miscellaneous steel.
- g. Rough hardware.
- h. Roofing.
- i. Insulation.
- j. Doors, frames and hardware.
- k. Windows and glazing.
- l. Metal studs.
- m. Gypsum board.
- n. Acoustical tile and panels.
- o. Carpet and pad.
- p. Demountable partitions.
- q. Equipment.
- r. Cabinets.
- s. Plumbing fixtures, piping, valves, sprinklers, supports and hangers.
- t. Mechanical equipment, refrigerants.
- u. Electrical conduit and copper wiring.
- v. Lighting fixtures, lamps and ballasts.
- w. Transformers, electrical devices, switchgear and panelboards.

2. Construction Waste Examples:

- a. Site-clearing waste.
- b. Masonry and CMU.
- c. Lumber, wood sheet materials and trim.
- d. Metals.
- e. Roofing.
- f. Insulation.
- g. Carpet and pad.
- h. Gypsum board.
- i. Piping.
- j. Electrical conduit.
- k. Packaging: Regardless of salvage/recycle goal indicated above, salvage or recycle 100 percent of the following uncontaminated packaging materials:

- 1) Paper, cardboard and boxes.

- 2) Plastic sheet and film.
- 3) Polystyrene packaging.
- 4) Wood crates.
- 5) Plastic pails.

1.5 SUBMITTALS

- A. Waste Management Plan: Submit 3 copies of plan within 7 days of date established for the Notice to Proceed.
- B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit 3 copies of report. Provide separate reports for demolition and construction waste. Include the following information:
 1. Material category.
 2. Generation point of waste.
 3. Total quantity of waste in tons.
 4. Quantity of waste salvaged, both estimated and actual in tons.
 5. Quantity of waste recycled, both estimated and actual in tons.
 6. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
- C. Qualification Data: For Waste Management Coordinator and refrigerant recovery technician.
- D. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that refrigerant was recovered compliant with EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.6 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management & Coordination." Review methods and procedures related to waste management including, but not limited to, the following:
 1. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
 2. Review requirements for documenting quantities of each type of waste and its disposition.
 3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
 4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
 5. Review waste management requirements for each trade.

1.7 WASTE MANAGEMENT PLAN

- A. General: Develop plan consisting of waste identification, waste reduction work plan, and cost/revenue analysis. Include separate sections in plan for demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition site-clearing and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 - 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 - 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement waste management plan approved by Architect. Provide handling, containers, storage, signage, transportation, and other items required to implement waste management plan during the entire duration of the Contract.
 - 1. Comply with Division 01 Section "Temporary Facilities and Controls" for operation, termination, and removal requirements.
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures appropriate for the Work occurring at Project site.

1. Distribute waste management plan to everyone concerned within 3 days of submittal return.
 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 2. Comply with Division 01 Section "Environmental Requirements" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until installation.
4. Protect items from damage during transport and storage.
5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Sale and Donation: Not permitted on Project site.

C. Salvaged Items for Owner's Use:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's designated storage area.
5. Protect items from damage during transport and storage.

D. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.

3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

A. General: Recycle paper and beverage containers used by on-site workers.

B. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.

1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

- a. Inspect containers and bins for contamination and remove contaminated materials if found.
2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING DEMOLITION WASTE

- A. Asphaltic Concrete Paving: Grind asphalt to maximum 1-1/2-inch size.
 1. Crush asphaltic concrete paving and screen to comply with requirements in Division 31 Section "Earth Moving" for use as general fill.
- B. Asphaltic Concrete Paving: Break up and transport paving to asphalt-recycling facility.
- C. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
 1. Pulverize concrete to maximum 1-1/2-inch size.
- D. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
 1. Pulverize masonry to maximum 1-1/2-inch size.
- E. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- F. Metals: Separate metals by type.
 1. Structural Steel: Stack members according to size, type of member, and length.
 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- G. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- H. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- I. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
 1. Separate suspension system, trim, and other metals from panels and tile and sort with other metals.
- J. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.

1. Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- K. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
- L. Plumbing Fixtures: Separate by type and size.
- M. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- N. Lighting Fixtures: Separate lamps by type and protect from breakage.
- O. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.
- P. Conduit: Reduce conduit to straight lengths and store by type and size.

3.5 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 2. Polystyrene Packaging: Separate and bag materials.
 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Site-Clearing Wastes: Chip brush, branches, and trees on-site.
- C. Wood Materials:
 1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
 2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.
 - a. Comply with requirements in Division 32 Section "Plants." for use of clean sawdust as organic mulch.
- D. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.
 1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.6 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in an EPA approved landfill acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Collect waste from construction areas and elsewhere daily.
 - 3. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 4. Comply with requirements of authorities having jurisdiction and NFPA 241 for removal of combustible waste material and debris.
 - 5. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F.
 - 6. Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing.
- B. Burning: Burning of materials on site is prohibited.
- C. Disposal: Transport waste materials and dispose of at designated spoil areas on Owner's property.
- D. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 01 74 19

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
 - 5. Repair of the Work.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for progress cleaning of Project site.
 - 2. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Section 017839 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION BY PHASE

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs and photographic negatives, damage or settlement surveys, **paint color schedules** and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

- B. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION BY PHASE

- A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
 2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report and warranty.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training videotapes.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.
 4. Submit list of incomplete items in the following format:
 - a. PDF electronic file. Architect will return annotated file.
 - b. Three paper copies. Architect will return two copies.

1.9 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 - 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

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

PART 3 - EXECUTION

3.1 FINAL CLEANING BY PHASE

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

- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - j. Clean transparent materials, including glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - n. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - 1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report on completion of cleaning.
 - o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - p. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 015000 "Temporary Facilities and Controls." Prepare written report.

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.

- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 01 77 00

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.

- a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.
2. Two paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return two copies.
- C. Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 30 days before commencing demonstration and training. Architect will return copy with comments.
1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
1. List of documents.
 2. List of systems.
 3. List of equipment.
 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Architect.
 7. Name and contact information for Commissioning Authority.
 8. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 9. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf or post-type binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

- a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
 4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
 1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 1. Fire.
 2. Flood.
 3. Gas leak.
 4. Water leak.
 5. Power failure.
 6. Water outage.
 7. System, subsystem, or equipment failure.
 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
 1. Instructions on stopping.

2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor has delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.
 7. Control diagrams.
 8. Piped system diagrams.
 9. Precautions against improper use.
 10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturer's name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

- C. **Manufacturers' Maintenance Documentation:** Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.

- D. **Maintenance Procedures:** Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.

- E. **Maintenance and Service Schedules:** Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. **Scheduled Maintenance and Service:** Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. **Maintenance and Service Record:** Include manufacturers' forms for recording maintenance.

- F. **Spare Parts List and Source Information:** Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

- G. **Maintenance Service Contracts:** Include copies of maintenance agreements with name and telephone number of service agent.

- H. **Warranties and Bonds:** Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. **Operation and Maintenance Documentation Directory:** Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

- B. **Emergency Manual:** Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."
- G. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.
- B. Related Requirements:
 - 1. Section 017300 "Execution" for final property survey.
 - 2. Section 017700 "Closeout Procedures" for general closeout procedures.
 - 3. Section 017823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit PDF electronic files of scanned record prints and one of file prints.
 - 2) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit PDF electronic files of scanned record prints and three set(s) of prints.
 - 2) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.

- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Locations and depths of underground utilities.
 - d. Revisions to routing of piping and conduits.
 - e. Revisions to electrical circuitry.
 - f. Actual equipment locations.
 - g. Duct size and routing.
 - h. Locations of concealed internal utilities.
 - i. Changes made by Change Order or Change Directive.
 - j. Details not on the original Contract Drawings.
 - k. Field records for variable and concealed conditions.
 - l. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, scan a full set of record prints of the Contract Drawings, as follows:
1. Format: PDF electronic file with comment function enabled.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file with comment function enabled.
 3. Record Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders, record Product Data, and record Drawings where applicable.

- B. Format: Submit record Specifications as annotated PDF electronic file.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as annotated PDF electronic file.
 - 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.
 - 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 01 78 39

SECTION 01 79 00 DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.

1.2 SUBMITTALS

- A. Instruction Program: Submit two copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

1.3 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section – 01 40 00 Quality Requirements, experienced in operation and maintenance procedures and training.
- C. Preinstruction Conference: Conduct conference at Project site. Review methods and procedures related to demonstration and training.
- D. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections.

- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:
1. Basis of System Design, Operational Requirements, and Criteria: Include system and equipment descriptions, operating standards, regulatory requirements, equipment function, operating characteristics, limiting conditions, and performance curves.
 2. Documentation: Review emergency, operations, and maintenance manuals; Project Record Documents; identification systems; warranties and bonds; and maintenance service agreements.
 3. Emergencies: Include instructions on stopping; shutdown instructions; operating instructions for conditions outside normal operating limits; instructions on meaning of warnings, trouble indications, and error messages; and required sequences for electric or electronic systems.
 4. Operations: Include startup, break-in, control, and safety procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; operating procedures for emergencies and equipment failure; and required sequences for electric or electronic systems.
 5. Adjustments: Include alignments and checking, noise, vibration, economy, and efficiency adjustments.
 6. Troubleshooting: Include diagnostic instructions and test and inspection procedures.
 7. Maintenance: Include inspection procedures, types of cleaning agents, methods of cleaning, procedures for preventive and routine maintenance, and instruction on use of special tools.
 8. Repairs: Include diagnosis, repair, and disassembly instructions; instructions for identifying parts; and review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
1. Owner will furnish qualified personal to describe Owner's intended operations.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
1. Schedule training with Owner with at least seven days' advance notice.
- D. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.

END OF SECTION 01 79 00

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcing, mix design, placement procedures, and finishes.
- B. Cast-in-place concrete includes the following:
 - 1. Foundations and footings.
 - 2. Slabs-on-grade.
 - 5. Vapor retarders under slabs
- C. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 09 sections for various floor covering specifications for concrete floor conditions requirements

1.3 PERFORMANCE REQUIREMENTS

- A. Moisture level in finished concrete shall be within limits acceptable to types of finish flooring indicated. Test methods and acceptable limits shall be as specified in Division 09 finish flooring Sections, or as required by finish flooring manufacturer's written product data or certified written statement. General Contractor is responsible for choosing and implementing methods of limiting excessive moisture during construction and curing, or remedial treatment, process, or other means to bring moisture level within acceptable limits, and for assigning and contracting for these responsibilities to installers.

1.4 SUBMITTALS

- A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds and others if requested by Architect.
- C. Shop drawings, Reinforcement: Submit three prints and scanned electronic copy in ".pdf" format of shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedule, stirrup spacing, diagrams of bent bars, arrangement of concrete

reinforcement. Include special reinforcement required and openings through concrete structures. All drawings shall be completely dimensioned.

- D. Laboratory test reports for concrete materials and mix design test.
- E. Material certificates in lieu of material laboratory test reports when permitted by Architect. Material certificates shall be signed by manufacturer, concrete producer, and Contractor, certifying that each material item complies with or exceeds specified requirements. Provide certification from admixture manufacturers that chloride content complies with specification requirements.

1.5 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified:
 - 1. American Concrete Institute (ACI) 301, "Specifications for Structural Concrete for Buildings."
 - 2. ACI 304 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete."
 - 3. ACI 318, "Building Code Requirements for Reinforced Concrete."
 - 4. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice."
- B. Concrete Testing Service: The Owner is responsible for an independent testing agency as defined in Division 1 Section Quality Requirements to perform materials evaluation, testing of concrete mix design, and to evaluate concrete delivered to and placed at site.
- C. Materials and installed work may require testing and retesting at any time during progress of Work. Tests, including retesting of rejected materials for installed Work, shall be done at Contractor's expense.
- D. Quality Control: The testing laboratory will perform sampling and testing during concrete placement, which may include the following as directed by Architect. This testing does not relieve Contractor of responsibility of providing concrete in compliance with specifications. Contractor may perform additional testing as necessary, at no expense to Owner, to ensure quality of concrete. Addition of water or cement to batch at the job site will be strictly limited to amounts allowed in Engineer Approved Mix Designs or water withheld from batch and clearly shown as such on Batch Ticket.
- E. Manufacturer's Data: Submit manufacturer's product data with installation instructions for proprietary materials including reinforcement and forming accessories, admixtures, joint materials, hardeners, curing materials and others as requested by Architect.
- F. Laboratory Reports: Owner's Testing Service will email copies of laboratory test or evaluation reports for concrete materials and mix designs.
- G. Mix Proportions and Design: Proportions mixes by either laboratory trial batch or field experience method complying with ACI 301.
- H. Submit written report to Architect for approval by Structural Engineer of each proposed concrete mix at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed and are acceptable to Structural Engineer.

- I Floor Slab Pre-Installation Conference: Conduct conference at Project site several days prior to pouring first slab on grade and determine then if second conference prior to first raised floor slab is required.
1. All required submittals shall be approved prior to conference. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Concrete subcontractor.
 - c. Ready-mix concrete manufacturer.
 - d. Plumbing and Electrical subcontractors.
 - e. Owner's Special Inspector.
 - f. Architect.
 2. Review special inspection, testing and procedures for field quality control, concrete finishes and finishing, protection of placed plumbing and electrical rough-ins, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, bond break material, forms and form removal limitations, shoring and reshoring procedures, capillary barrier requirements, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.
- J. Substitute Requests For A Specified Entity
1. Information requested under this paragraph heading is the minimum required information for consideration and evaluation and additional information may be requested. This information is required in addition to information required by any substitute request forms that may be included in the Project Manual or Contract Documents, or otherwise provided.
 2. The Architect reserves the option to reject any and all requests for a substitute. Where the Contract Documents list only one entity without "Or equal" or similar language, substitutes will not be considered. Where the Contract Documents list less than 3 entities, substitutes may be reviewed and evaluated on an individual base.
 3. Include the following information on the cover page of the request:
 - a. Name of Project and project number as shown in the header of the specification
 - b. Date request is being made.
 - c. Name of person, company, and contact information of person requesting substitute.
 - d. Specification title and number and drawing number where the specified product is listed or shown.
 - e. Exact name of the specified entity and substitute entity. .
 4. When requesting a substitute, include all requested and required supporting data, specifications, and performance criteria. The Architect must receive this substitute request no later than the time stated elsewhere for submitting product substitutions. If no time is stated, then 10 days prior to date of bid opening. When a Request For Substitute Form is included in the Project Manual, properly complete the form and include it with the submittal.

5. Verbal requests for a substitute or requests that do not comply with these provisions are not acceptable, will be rejected, and will not extend the submittal deadline. Submittals that are incomplete, have vague or unspecific answers (“Better”. “Cheaper”. “More competitive”, etc.); that lack supporting data to substantiate equal or superior quality/design; that do not include the requested proof, verification, reports, and substantiating documentation; or are received after submittal deadline will be rejected. Provide convincing answers as to why the substitute should be approved. Rejection or disapproval will not extend the submittal deadline.
 - a. If the substitute entity differs from specified entity, compare the substitute entity with the specified entity in a tabular format that clearly shows all the differences.
6. Include the following information on all requests for substitutes:
 - a. Length of time the manufacturer has been in business.
 - b. Whether the manufacturer operated under any other name, and if so, under what name and when?
 - c. Length of time the substitute entity has been on the market.
 - d. Whether the substitute entity has been marketed under any other name, and if so, under what name and when?
 - e. Who will install and service the substitute entity?
 - f. Whether the installer is trained and certified by the manufacturer? If so, describe how this training and certification are achieved and if training records are maintained?
 - g. All required changes in the project design that will be required to incorporate the substitute entity.
 - h. Describe any known problems or failures associated with the substitute entity? If there are any, provide details.
7. The manufacturer’s published literature, description, capabilities, operating and performance parameters, options, accessories, etc. of all submitted substitutes shall meet or exceed those published by the manufacturer of the specified entity even if they are not specifically mentioned in the Contract Documents. Additionally, manufacturers whose standards are less than those of the specified entity but are capable of producing an entity that meets the specified entity shall not, for the convenience of their normal production methods, vary from the specified entity standards.
8. Where test data and standards are being submitted as supporting data and for comparison with the specified item, comply with the following requirements. Submittals not complying with these provision will be considered incomplete, unacceptable, and will be rejected:
 - a. All substitutes shall meet all of the minimum performance criteria of the specified entity.
 - b. Submit certified data provided by an independent testing laboratory.
 - c. Prepare supporting data in side-by-side tabular form showing the submitted criteria next to each specified performance criteria and denoting the differences between the specified item the substitute item.
 - d. Show submitted data using same tests and standards and with the values and results in the same units of measure as those shown for the specified item.
 - e. Where a performance criterion is not listed in the specifications, comply with the specified product manufacturer’s published data for performance criteria.
 - f. Where the specified entity requires certifications, registrations, approvals, policies, practices, etc., submit proof that the substitute entity is in compliance.
9. Each and all requests for substitutes shall be signed by the person making the submittal. By signing the submittal, the person requesting the substitute certifies and agrees to the

following requirements. Requests without the signature of a responsible person will be rejected.

- a. That the specifications have been read and are understood,
 - b. That the entity being submitted meets or exceeds all provisions of the specifications,
 - c. That all submitted information is true and accurate,
 - d. Will remove the substitute entity and replace it with an acceptable product, at his expense, if it is determined that the substitute does not meet the specifications as certified.
 - e. Agrees to pay for all necessary design changes and increased construction costs to incorporate the substitute entity.
- K. The Contractor shall comply with all provisions of the Contract Documents including, but not limited to, providing and installing such entities as the products, materials, equipment, components, or systems that were proposed at the time bids were received. Except for extenuating circumstances as determined by the Architect, notification of not being able to meet any of the provisions of the Contract Documents or communicating conflicts in the Contract Documents to the Architect will not be considered after receipt of bids; and the Contractor shall fully comply with the Contract Documents at no increase in Contract Sum or Contract Time.

PART 2 - PRODUCTS

2.1 FORM MATERIALS

- A. Provide form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection.
- B. Forms for Exposed Finish Concrete: 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. Use forms that will provide a smooth concrete surface without depressions, fins, pockmarks, bug holes, honeycombs, spalls, or popcorn or other defects objectionable to the Architect.
 1. Use overlaid plywood complying with U.S. Product Standard PS-1 "A-C or B-B High Density Overlaid Concrete Form," Class I.
- C. Forms for Unexposed Finish Concrete: Plywood, lumber, metal, or another acceptable material. Provide lumber dressed on at least two edges and one side for tight fit.
- D. Form Release Agent: Provide commercial formulation form release agent with a maximum of 350 g/L volatile organic compounds (VOCs) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
- E. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties designed to prevent form deflection and to prevent spalling of concrete upon removal. Provide units that will leave no metal closer than 1-1/2 inches to the plane of the exposed concrete surface.
 1. Provide ties that, when removed, will leave holes not larger than 1 inch in diameter in the concrete surface.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars: ASTM A 615, Grade 60 deformed, unless otherwise indicated. All rebar splices, including intersections of footings and bond beams, shall be Class B tension lap splices unless noted otherwise.
- B. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.
- C. Supports for Reinforcement: 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 specifications.
 - 1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
 - 1. Use one brand of cement throughout Project unless otherwise acceptable to Architect.
 - 2. All materials and mixes shall have minimum proportions of alkali, sulfates, and free salts so as to prevent or minimize efflorescence after installation.
- B. Fly Ash: ASTM C 618, Type F.
- C. Normal-Weight Aggregates: ASTM C 33 and as specified. Provide aggregates from a single source for exposed concrete.
 - 1. For exposed exterior surfaces, do not use fine or coarse aggregates that contain substances that cause spalling. Ocean sand is not acceptable.
 - 2. Local aggregates not complying with ASTM C 33 that have been shown to produce concrete of adequate strength and durability by special tests or actual service may be used when acceptable to Architect.
- D. Lightweight Aggregates: ASTM C 330.
- E. Water: Potable.
- F. Admixtures, General: All admixtures are to be used in strict accordance with manufacturer's directions. The supplier will certify that all admixtures contain no chlorides or other corrosive materials. Calcium Chloride will NOT be permitted.
- G. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
- H. High-Range Water-Reducing Admixture: ASTM C 494, Type F or G. Only use admixtures which have been tested and accepted in mix designs, unless otherwise acceptable.
- I. Accelerators: ASTM C-494, Type C non-chloride, non-corrosive type accelerators.

2.4 RELATED MATERIALS

- A. Reglets: Where sheet flashing or bituminous membranes are terminated in reglets, provide reglets of not less than 0.0217- inch-thick galvanized sheet steel. Fill reglet or cover face opening to prevent intrusion of concrete or debris.
- B. Waterstops: Provide flat, dumbbell-type or centerbulb-type waterstops at construction joints and other joints as indicated. Size to suit joints.
- C. Rubber Waterstops: Corps of Engineers CRD-C 513.
- D. Polyvinyl Chloride Waterstops: Corps of Engineers CRD-C 572.
- E. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd., complying with AASHTO M 182, Class 2.
- F. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
 - 1. Waterproof paper.
 - 2. Polyethylene film.
 - 3. Polyethylene-coated burlap.
- G. Curing Sealing Compound: Liquid-type membrane-forming curing compound complying with ASTM C 309, Type I, Class A. Moisture loss not more than 0.55 kg/sq. m when applied at 200 sq. ft./gal. Material shall conform to applicable VOC requirements. For use where wet curing is required. Do not use curing-sealing compound where bonded finishes will be installed. Provide material by one of the following manufacturers:
 - 1. Euclid Chemical
 - 2. Master Builders
 - 3. W.R. Meadows
- H. Concrete Sealer: Where the finish schedule shows the floor to be sealed concrete, provide a colorless, transparent sealer. See Specification Section 09 05 17 Sealing Concrete Slabs and Floors for further information. One-time application shall provide permanent dust proofing, sealing, water resistance, and hardening properties and resistance to grease and oil. Product: Ashford Formula by Curecrete Chemical Company, Inc. or a reviewed substitute. Spray-apply according to manufacturers recommendations by an applicator approved by the manufacturer. Provide manufacturer's lifetime warranty to remain sealed and dustproofed.
- I. Epoxy Adhesive: ASTM C 881, two-component material suitable for use on dry or damp surfaces. Provide material type, grade, and class to suit Project requirements.
 - 1. Horizontal Applications: Concreive Paste by Master Builders or reviewed substitute.
 - 2. Vertical Applications: Concreive Liquid by Master Builders or reviewed substitute.

2.5 PROPORTIONING AND DESIGNING MIXES

- A. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use an independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

1. Do not use the same testing agency for field quality control testing.
 2. Limit use of fly ash to:
 - a. The maximum substitution of fly ash for Portland cement shall be no more than 20% by weight of the required Portland cement. Substitution shall be at rate of 1.2 pounds of fly ash per pound of cement.
 - b. Fly ash shall meet the specification restrictions of ASTM C618 for Class F except that the loss on ignition shall not exceed 4%. Fly ash shall also meet the optional physical restrictions on uniformity as shown in Table 2A of specifications ASTM C618.
 - c. The contractor shall furnish the Architect with a Materials Certification for each supplier furnishing fly ash showing the fly ash meets the stated restrictions. The laboratory which performs the tests and certification shall be regularly inspected by the Cement and Concrete Reference Laboratory (CCRL) for fly ash testing and shall authorize CCRL to submit copies of the inspection reports directly to the Engineer. Upon receipt of the certification the fly ash may be used in concrete for the project.
 - d. Type IP blended cement may be used in lieu of Portland cement and fly ash. The pozzolanic content of the blended cement shall be specified to meet minimum provisions stated in this criteria for fly ash.
 - e. Fly ash is not to be allowed in concrete placed subject to cold weather placement procedures (ACI C306).
 - f. The use of set control additives (ASTM C494 Types B, C, D, E, and G) may only be used with the approvals of the Engineer. The additives shall only be added at the point of batching.
- B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of Work. Do not begin concrete production until proposed mix designs have been reviewed by Architect's Structural Engineer.
- C. Design mixes to provide normal weight concrete with the following properties as indicated on drawings and schedules:
1. 4000 psi, 28-day compressive strength; water-cement ratio, 0.57 maximum (non-air-entrained), 0.48 maximum (air-entrained).
 2. 3000 psi, 28-day compressive strength; water-cement ratio, 0.68 maximum (non-air-entrained), 0.59 maximum (air-entrained).
- D. Water-Cement Ratio: Provide concrete for following conditions with maximum water-cement (W/C) ratios as follows:
1. Subjected to freezing and thawing: W/C 0.45.
 2. Subjected to deicers/watertight: W/C 0.40.
 3. Subjected to brackish water, salt spray, or deicers: W/C 0.40.
- F. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in Work.

2.6 ADMIXTURES

- A. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.
- B. Use accelerating admixture in concrete slabs placed at ambient temperatures below 50 F or below at the time of placement or for 5 hours thereafter.
- C. Use high-range water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs, architectural concrete, parking structure slabs, concrete required to be watertight, and concrete with water-cement ratios below 0.50.
- D. Use air-entraining admixture in exterior exposed concrete unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content with a tolerance of plus or minus 1-1/2 percent within the following limits:
 - 1. Concrete structures and slabs exposed to freezing and thawing, deicer chemicals, or hydraulic pressure:
 - a. 4.5 percent (moderate exposure); 5.5 percent (severe exposure) for 1-1/2 inch maximum aggregate.
 - b. 4.5 percent (moderate exposure); 6.0 percent (severe exposure) for 1 inch maximum aggregate.
 - c. 5.0 percent (moderate exposure); 6.0 percent (severe exposure) for 3/4 inch maximum aggregate.
 - d. 5.5 percent (moderate exposure); 7.0 percent (severe exposure) for 1/2 inch maximum aggregate.
 - 2. Other concrete not exposed to freezing, thawing, or hydraulic pressure, or to receive a surface hardener: 2 to 4 percent air.
- E. Use admixtures for water reduction and set accelerating or retarding in strict compliance with manufacturer's directions.

2.7 CONCRETE MIXING

- A. Ready-Mixed Concrete: Comply with requirements of ASTM C 94, and as specified.
 - 1. When air temperature is between 85 deg F and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

2.8 VAPOR RETARDERS:

- A. Sheet Vapor Retarder: ASTM E 1745, Class A, minimum 15 mil thickness.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Stego Industries LLC; Stego Wrap 15-Mil Vapor Barrier.
 - b. Fortifiber Corporation; Moistop Ultra A.
 - c. Raven Industries Inc.; Vapor Block 15.
 - d. W.R. Meadows, Inc.; Sealtight Vapormat 15.
 - 2. Seam Tape: Manufacturer's recommended adhesive or pressure-sensitive tape.

2.9 CAPILLARY BARRIERS:

- B. Clean compactable and trimmable mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a 3/8-inch (9.5-mm) sieve, 10 to 30 percent passing a No. 100 sieve, and at least 5 percent passing No. 200 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

PART 3 - EXECUTION

3.1 GENERAL

- A. Coordinate the installation of joint materials, vapor retarder/barrier, and other related materials with placement of forms and reinforcing steel.
- B. Where concrete surfaces are to receive vinyl or rubber or other type resilient finishes, concrete shall be poured, finished, cured, prepared, and tested to comply with the requirements of ASTM F710.

3.2 FORMS

- A. General: Design, erect, support, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads that might be applied until concrete structure can support such loads. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction tolerances and surface irregularities complying with the following ACI 347 limits:
 - 1. Provide Class A tolerances for concrete surfaces exposed to view.
 - 2. Provide Class C tolerances for other concrete surfaces.
- B. Construct forms 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, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in the Work. Use selected materials to obtain required finishes. Solidly butt joints and provide backup at joints to prevent cement paste from leaking.
- C. Fabricate forms for easy removal without hammering or prying against 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, recesses, and the like for easy removal.
- D. Provide temporary openings for clean-outs and inspections where interior area of formwork is inaccessible before and during concrete placement. Securely brace temporary openings and set tightly to forms to prevent losing concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- E. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

- F. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.
- G. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

3.3 VAPOR RETARDERS

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Place vapor retarder with longest dimension parallel to direction of pour and face laps away from the expected direction of placement whenever possible.
 - 2. Lap joints per manufacturer, but not less than 6 inches and seal with manufacturer's recommended tape or adhesive.
 - 3. Extend vapor retarder to edge of slab in all cases.
 - 4. At conditions terminating into a wall turn vapor retarder up wall, extend to top of slab and seal to wall with manufacturer's tape or mastic unless obstructed by dowels, waterstops or other elements or unless specifically required otherwise by manufacturer.
 - a. Where specific conditions prevent turning vapor retarder up and sealing submit specific procedure for turning vapor retarder down and sealing to wall or footing.
 - 5. Ma seam tape or mastic shall be applied to clean and dry vapor retarder in strict accordance with manufacturer's recommendations.
 - 6. Seal all penetrations including pipes and permanent stakes per manufacturer's instructions.
 - 7. Do not use non-permanent stakes driven through the vapor retarder.
 - 8. Repair damaged areas with vapor retarder patch of the typical vapor retarder material sealed with manufacturer's tape or mastic in strict accordance with manufacturer's recommendations for repair.

3.4 PLACING REINFORCEMENT

- A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars," for details and methods of reinforcement placement and supports and as specified.
 - 1. Avoiding cutting or puncturing vapor retarder/barrier during reinforcement placement and concreting operations. Repair damages before placing concrete.
- 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. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as approved by Architect.

- D. Place reinforcement to maintain minimum coverages as indicated 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.
- E. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 JOINTS

- A. Construction Joints: Locate and install construction joints so they do not impair strength or appearance of the structure, as acceptable to Architect and Engineer.
 - 9. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - a. Provided additional reinforcing across construction joints where indicated in contract documents
 - b. Provide doweled joints in all slabs on grade construction joints or use approved alternative method.
 - 10. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.
 - 11. Locate joints in slabs on steel deck as follows:
 - a. Joints parallel to joist (perpendicular to girders) shall be located at the midpoint between two adjacent joists
 - b. Joints perpendicular to parallel to girders (perpendicular to joists) shall be located at the midpoint of two adjacent girders.
 - 12. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - 13. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- B. Provide dowels in construction joints in slabs, or use approved alternative method such as bulkheads designed and accepted for this purpose.
- C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints except as indicated otherwise. Do not continue reinforcement through sides of strip placements.
- D. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.
- E. Waterstops: Provide waterstops in construction joints as indicated. If not indicated, as required to stop water penetration into the building envelope through foundation. Install waterstops to form continuous diaphragm in each joint. Support and protect exposed waterstops during progress of Work. Field-fabricate joints in waterstops according to manufacturer's printed instructions.
- F. Isolation Joints in Slabs-on-Grade: Construct isolation joints in slabs-on-grade at points of contact between slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Use bond break methods such as vapor barrier or building felts for these isolation joints.

G. Contraction (Control) Joints in Slabs-on-Grade: Construct contraction joints in slabs-on-grade to form panels of patterns as shown. Use saw cuts 1/8 inch wide by one-fourth of slab depth.

1. Saw cut joints as soon as possible after the slab has been placed; do not saw cut while the joint has a chance to ravel but in no case the joints shall saw cut no later than 12 hours after the concrete has been placed.

2. If joint pattern is not shown, provide joints not exceeding 15 ft. in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays).

3. Joint fillers and sealants are specified in Division 07 Section "Joint Sealants."

3.6 INSTALLING EMBEDDED ITEMS

A. General: Set and build into formwork 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, instructions, and directions provided by suppliers of items to be attached.

B. Forms for Slabs: Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and contours in finished surfaces. Provide and secure units to support screed strips using strike-off templates or compacting-type screeds.

3.7 PREPARING FORM SURFACES

A. General: Coat contact surfaces of forms with an approved, nonresidual, low-VOC, form-coating compound before placing reinforcement.

B. Do not allow excess form-coating material to accumulate in forms or come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply according to manufacturer's instructions.

1. Coat steel forms with a nonstaining, rust-preventative material. Rust-stained steel formwork is not acceptable.

3.8 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.

B. General: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete," and as specified.

C. Concrete Placement

1. Unless indicated otherwise on the Drawings, place concrete in the following listed locations with the applicable compressive strengths:

a. Foundations: 3,000 psi

b. Foundation Walls: 3,000 psi

- c. Slabs On Grade: 3,000 psi
 - d. Piers: 3,000 psi
 - e. Elevated Floors Poured in Forms: 4,000 psi
 - f. Stairs and Landings: 3,000 psi.
- D. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation at its final location.
- E. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement 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 complying with ACI 309.
 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix to segregate.
- F. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until completing placement of a panel or section.
1. Consolidate concrete during placement operations so that concrete is thoroughly worked around reinforcement, other embedded items and into corners.
 2. Bring slab surfaces to correct level with a straightedge and strike off. Use bull floats or darbies to smooth surface free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.
 3. Maintain reinforcing in proper position on chairs during concrete placement.
 4. Sidewalks: Form and finish all sidewalks with a crown or slope 1/8 inch per foot to eliminate standing water. Slope surface perpendicular (right angles to) the direction of traffic. Finish to a light broom finish to comply with ADA
- G. Cold-Weather Placement: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
- H. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 2. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- I. Hot-Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305 and as specified.

1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 90 deg F. 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 water. Using liquid nitrogen to cool concrete is Contractor's option.
2. 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 embedding in concrete.
3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without puddles or dry areas.
4. Use water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to Architect.

3.9 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: Provide a rough-formed finish on formed concrete surfaces not exposed to view in the finished Work or concealed by other construction. 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 inch in height rubbed down or chipped off.
- B. Smooth-Formed Finish: Provide a smooth-formed finish on 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, dampproofing, veneer plaster, painting, or another similar system. This is an as-cast concrete surface obtained with selected form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch defective areas with fins and other projections completely removed and smoothed.
- C. Smooth-Rubbed Finish: Provide smooth-rubbed finish on scheduled concrete surfaces that have received smooth-formed finish treatment not later than 1 day after form removal.
 1. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
 2. Thoroughly wet concrete surfaces, apply grout to coat surfaces, and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces 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.

3.10 MONOLITHIC SLAB FINISHES

- A. DO NOT USE CEMENT TO "HOT-SHOT" OR "DRY-UP" CONCRETE.
- B. Scratch Finish: Apply scratch finish to monolithic slab surfaces to receive concrete floor topping or mortar setting beds for tile, Portland cement terrazzo, and other bonded applied cementitious finish flooring material, and where indicated.

1. After placing slabs, finish surface to tolerances of F(F) 25 (floor flatness) and F(L) 20 (floor levelness) measured according to ASTM E 1155. See structural for additional requirements. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set with stiff brushes, brooms, or rakes.
- C. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as specified; slab surfaces to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo; and where indicated.
1. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating, using float blades or float shoes only, 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 hand-floating if area is small or inaccessible to power units. Finish surfaces to tolerances of F(F) 25 (floor flatness) and F(L) 20 (floor levelness) measured according to ASTM E 1155. See structural for additional requirements. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.
- D. Trowel Finish: Apply a trowel finish to monolithic slab surfaces exposed to view and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, sports floor, paint, or other thin film-finish coating system.
1. 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 finish surfaces to tolerances of F(F) 25 (floor flatness) and F(L) 20 (floor levelness) measured according to ASTM E 1155. See structural for additional requirements. Grind smooth any surface defects that would telegraph through applied floor covering system.
- E. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply a trowel finish as specified, then immediately follow by slightly scarifying the surface with a fine broom.
- F. Nonslip Broom Finish: Apply a nonslip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
 2. Sidewalks: Form and finish all sidewalks with a crown or slope 1/8 inch per foot to eliminate standing water. Slope surface perpendicular (right angles to) the direction of traffic so that water drains to the short dimension of the walk. . Finish to a light broom finish to comply with ADA requirements for slip resistance.
- 3.11 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 specified to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete Work.

- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. 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 diagrams or templates of manufacturer furnishing machines and equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in safety inserts and accessories as shown on drawings. Screed, tamp, and trowel-finish concrete surfaces.
- E. Abrasive Nosing For Cast In Place Loading Dock Walls:
 - 1. Install according to the manufacturer's instructions.
 - 2. Coordinate installation of the nosing with the concrete pouring.
 - 3. Install nosing prior to the initial set of the concrete.
 - 4. Puddle concrete, set nosing in place and then tamp nosing to ensure complete concrete settlement around the anchors. Ensure that the concrete is flush with the front lip of the nosing.
 - 5. Ensure that the nosing is level and square to the loading dock and that the ends of the nosing are equidistant from the ends of the wall. The ends of the nosing should be 3 inches from the ends of the concrete wall.
 - 6. Remove protective cover from the tread.

3.12 CONCRETE CURING AND PROTECTION

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. In hot, dry, and windy weather protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply according to manufacturer's instructions after screeding and bull floating, but before power floating and troweling.
- B. 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.
- C. Curing Methods:
 - 1. Compounds:
 - a. Curing compounds shall not be used on slabs that are to receive a painted finish or finish to be applied with an adhesive or concrete surfaces that are to be sealed or polished. Cure concrete by curing compound, by moist curing, by moisture-retaining cover curing, or by combining these methods, as specified.
 - b. Apply curing compound on exposed interior slabs and on exterior slabs, walks, and curbs as follows:
 - 1). Apply curing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or roller according to 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.

- 2). Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.
2. Moisture curing: Provide moisture curing over floors to receive a painted finish or finish to be applied with an adhesive, or concrete surfaces to be sealed or polished. Use on of the following methods:
 - a. Keep concrete surface continuously wet by covering with water.
 - b. Use continuous water-fog spray.
 - c. Cover concrete surface with specified absorptive cover, thoroughly saturate cover with water, and keep continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with a 4 inch lap over adjacent absorptive covers.
 - d. Provide moisture-retaining cover curing, over areas not requiring moisture curing. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - D. Apply curing compound only on exterior slabs, walks, and curbs and on exposed interior slabs that are not to receive any type of bonded finish or a sealer as follows:
 1. Apply curing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours and after surface water sheen has disappeared). Apply uniformly in continuous operation by power spray or roller according to 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.
 2. Use membrane curing compounds that will not affect surfaces to be covered with finish materials applied directly to concrete.
 - E. Curing Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces, by moist curing with forms in place for the full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.
 - F. Curing Unformed Surfaces: Cure unformed surfaces, including slabs, floor topping, and other flat surfaces, by applying the appropriate curing method.
 1. Final cure concrete surfaces to receive finish flooring with a moisture-retaining cover, unless otherwise directed.
 - G. Where sealed floors are scheduled or indicated, apply concrete sealer as recommended by the sealer manufacturer to achieve manufacturer's lifetime warranty to remain sealed and dustproofed. .
- 3.13 REMOVING FORMS
- A. General: 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 deg F 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, joists, slabs, and other structural elements, may not be removed in less than 14 days or until concrete has attained at least 75

percent of 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.

3.14 REUSING FORMS

- A. Clean and repair surfaces of forms to be reused in the 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 formwork.
- 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.

3.15 CONCRETE SURFACE REPAIRS

- A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removing forms, when acceptable to Architect. All exposed surfaces shall be smooth and even without depressions, fins, pockmarks, bug holes, honeycombs, spalls, popcorn or other defects objectionable to the Architect. Any defect visible from 10 feet under normal light conditions is unacceptable and shall be repaired to the satisfaction of the Architect.
- B. Mix dry-pack mortar, 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.
 - 1. Cut out honeycombs, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts down to solid concrete but in no case to a depth less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with bonding agent. Place patching mortar before bonding agent has dried.
 - 2. For surfaces exposed to view, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Provide test areas at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.
- C. Repairing Unformed Surfaces: Test unformed surfaces, such as monolithic slabs, for smoothness and verify surface tolerances specified for each surface and finish. Correct low and high areas as specified. Test unformed surfaces sloped to drain for trueness of slope and smoothness by using a template having the required slope.
 - 1. Repair finished unformed surfaces containing defects that affect the concrete's durability. Surface defects include crazing and cracks in excess of 0.01 inch wide or that penetrate to the reinforcement or completely through nonreinforced sections regardless of width, spalling, popouts, honeycombs, rock pockets, and other objectionable conditions.
 - 2. Correct high areas in unformed surfaces by grinding after concrete has cured at least 14 days.

3. Correct low areas in unformed surfaces during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Architect.
 4. Repair defective areas, except random cracks and single holes not exceeding 1 inch in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose reinforcing steel with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
- D. Repair isolated random cracks and single holes 1 inch or less in diameter by dry-pack method. Groove top of cracks and cut out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Place dry-pack before bonding agent has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs with prior approval of Architect for method and procedure, using specified epoxy adhesive and mortar.
- F. Repair methods not specified above may be used, subject to acceptance of Architect.
- G. Concrete Fill for Floor Slabs:
1. Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.
 - a. For slabs on grade, ensure sub-grade is properly prepared and compacted to specified density. Expose the edges of vapor retarder, if one is installed, so the new vapor retarder can overlap the exposed edges.
 - b. Bore holes in edge of existing slab for rebar dowels. Size holes for rebar and packing grout
 - c. Install specified vapor retarder over prepared grade. Ensure that new vapor retarder overlaps existing vapor retarder.
 - d. Install rebar dowels with grout.
 - e. Place, finish, and cure concrete as previously specified for slabs on grade. Finished concrete shall be flush with and have the same finish and texture as adjacent concrete. If finished floor to be used on the new concrete slab requires surface finish/texture other than what is on adjacent surface, then provide the surface texture required by the floor finish manufacturer.
 - f. Finish and fill joints formed by new concrete fill and existing joints to prevent spalling of edges and dirt from entering the joints.
- 3.16 QUALITY CONTROL TESTING DURING CONSTRUCTION
- A. Sampling and testing for quality control during concrete placement may include the following, as directed by Architect.
1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.

- a. Slump: ASTM C 143; one test at point of discharge for each load of concrete; additional tests when concrete consistency seems to have changed.
 - b. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete with a minimum of one for each set of compressive strength specimens.
 - c. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below, when 80 deg F and above, and one test for each set of compressive-strength specimens.
 - d. Compression Test Specimen: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
 - e. Compressive-Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yd. plus additional sets for each 50 cu. yd. more than the first 25 cu. yd. of each concrete class placed in any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
2. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
 3. When total quantity of a given class of concrete is less than 50 cu. yd., Architect may waive strength testing if adequate evidence of satisfactory strength is provided.
 4. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
 5. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi.
- B. Test results will be reported by the Owner's Testing Service in writing via email to Architect, Structural Engineer, ready-mix producer, and Contractor within 24 hours after tests. 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. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
- D. Additional Tests: The testing agency 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 agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

3.17 MATERIAL STORAGE

- A. Store materials to permit easy access for inspection and identification. Keep reinforcing steel off the ground, using pallets, platforms, or other supports. Protect reinforcing steel and packaged materials from erosion and deterioration.

3.18 SPECIAL TREATMENT OF GREEN CONCRETE

- A. The following procedures shall be performed only with written permission from the Owner and the Architect and approval of the finish floor covering manufacturer and shall not be used for routine finishing. Products and systems used shall be approved by and acceptable to the finish floor manufacturer. These procedures are intended to prepare green concrete to receive a finish prior to the normal 28-day curing period resulting from extenuating circumstances or when measured internal relative humidity of the concrete and vapor emission rate of the concrete exceed the levels required by the finished floor covering manufacturer. If these procedures are used without written permission, the Owner may request the Contractor to remove the concrete and installed finishes and to replace with new concrete and finishes. Install all materials in strict compliance with the manufacturer's instructions.
- B. Manufacturer: Ardex Engineering Cements Inc. or a product/system recommended and approved by the finish floor manufacturer that will bring internal relative humidity of the concrete and vapor emission rate of the concrete to levels acceptable to the finished floor covering manufacturer.
- C. Products:
 - 1. Ardex Moisture Control System
 - 2. Ardex K-15 Self Leveling Underlayment
- D. To prepare green concrete to receive a floor finish prior to the recommended 28 days, perform the following:
 - 1. Allow concrete to cure a minimum of 7 days.
 - 2. Shot blast surfaces to open concrete and to set a surface profile required by the moisture control manufacturer.
 - 3. Allow prepared surfaces to remain open for 24 hours.
 - 4. Confirm concrete has a minimum tensile strength of 200 psi per ASTM D4541.
 - 5. Ensure moisture emission rate does not exceed 12 pounds/1000 sq. ft./24 hours during a Calcium Chloride Test conducted per ASTM F1869.
 - 6. Treat hairline cracks, construction, control, expansion, and isolation joints as recommended by the moisture control manufacturer.
 - 7. Apply Moisture Control System in strict compliance with manufacturer's instructions.
 - 8. When surface conditions of the concrete do not meet finish floor covering manufacturer's requirements for levelness and flatness, apply K15 underlayment according to manufacturer's instructions to smooth concrete surfaces.
 - 9. Install floor finish.

END OF SECTION 03 30 00

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following metal fabrications:
 - 1. Loose bearing and leveling plates.
 - 2. Loose steel lintels.
 - 3. Shelf and relieving angles
 - 4. Miscellaneous framing and supports for applications where framing and supports are not specified in other sections.
 - 5. Miscellaneous steel trim and edgings.
 - 6. Ladders
 - 7. Field surface preparation and field touch-up.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 04 Section "Unit Masonry" for control and expansion joints at shelf angles
 - 2. Division 05 Section "Structural Steel" for structural steel framing system components.
 - 3. Division 09 Sections "Exterior Painting" and "Interior Painting" for touch up of metal fabrications.
 - 4. Division 13 Section "Metal Building Systems" for structural steel framing associated with metal building system.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 01 Specification Sections.
- B. Shop drawings detailing fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other Sections.
 - 1. Show method and details of bracing, including type and size of members and connections to be used, for all roof penetrations that are 12 inches or greater in diameter.
- C. Samples representative of materials and finished products as may be requested by Architect.
- D. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.

- E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include a list of completed projects with project name, addresses, names of architects and owners, and other information specified.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Engage a firm experienced in fabricating structural steel similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to fabricate structural steel without delaying the Work. Steel fabricator shall meet the following minimum requirements:

1. Minimum of 10 years' continuous experience on projects of similar size and complexity.
2. Have AISC certification or a certified written letter from an approved third party special inspections agency, on the agency's letterhead, stating the following:
 - a. The steel fabricator's quality control program and manual comply with requirements in Chapter 17 of the applicable edition of the IBC.
 - b. Results of observed periodic auditing of fabrication practices and procedures comply with Chapter 17 of the applicable edition of the IBC.
 - b. Performed work meets acceptable industry standards.
3. Be able to perform the specified surface preparation requirements. However, as a minimum, be able to perform surface preparation up to and including SSPC 6 by Wheelabrator or blast.
4. Be able to apply inorganic zinc primers and high build epoxy primers
5. If a contractor has listed himself as self-performing for this discipline and is not listed below as prequalified, that contractor shall complete the applicable sections of the Request For Substitute Form and provide proof of meeting all qualification provisions listed herein. Pre-approved fabricators are selected by CM:

- B. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code--Steel," AWS D1.2 "Structural Welding Code--Aluminum," and AWS D1.3 "Structural Welding Code--Sheet Steel."

1. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

- C. Substitute Requests For A Specified Entity

1. Information requested under this paragraph heading is the minimum required information for consideration and evaluation and additional information may be requested. This information is required in addition to information required by any substitute request forms that may be included in the Project Manual or Contract Documents, or otherwise provided.
2. The Architect reserves the option to reject any and all requests for a substitute. Where the Contract Documents list only one entity without "Or equal" or similar language, substitutes will not be considered. Where the Contract Documents list less than 3 entities, substitutes may be reviewed and evaluated on an individual base.
3. Include the following information on the cover page of the request:
 - a. Name of Project and project number as shown in the header of the specification
 - b. Date request is being made.
 - c. Name of person, company, and contact information of person requesting substitute.
 - d. Specification title and number and drawing number where the specified product is listed or shown.

- e. Exact name of the specified entity and substitute entity. .
4. When requesting a substitute, include all requested and required supporting data, specifications, and performance criteria. The Architect must receive this substitute request no later than the time stated elsewhere for submitting product substitutions. If no time is stated, then 10 days prior to date of bid opening. When a Request For Substitute Form is included in the Project Manual, properly complete the form and include it with the submittal.
5. Verbal requests for a substitute or requests that do not comply with these provisions are not acceptable, will be rejected, and will not extend the submittal deadline. Submittals that are incomplete have vague or unspecific answers (“Better”. “Cheaper”. “More competitive”, etc.); that lack supporting data to substantiate equal or superior quality/design; that do not include the requested proof, verification, reports, and substantiating documentation; or are received after submittal deadline will be rejected. Provide convincing answers as to why the substitute should be approved. Rejection or disapproval will not extend the submittal deadline.
 - a. If the substitute entity differs from specified entity, compare the substitute entity with the specified entity in a tabular format that clearly shows all the differences.
6. Include the following information on all requests for substitutes:
 - a. Length of time the manufacturer has been in business.
 - b. Whether the manufacturer operated under any other name, and if so, under what name and when?
 - c. Length of time the substitute entity has been on the market.
 - d. Whether the substitute entity has been marketed under any other name, and if so, under what name and when?
 - e. Who will install and service the substitute entity?
 - f. Whether the installer is trained and certified by the manufacturer? If so, describe how this training and certification are achieved and if training records are maintained?
 - g. All required changes in the project design that will be required to incorporate the substitute entity.
 - h. Describe any known problems or failures associated with the substitute entity? If there are any, provide details.
7. The manufacturer’s published literature, description, capabilities, operating and performance parameters, options, accessories, etc. of all submitted substitutes shall meet or exceed those published by the manufacturer of the specified entity even if they are not specifically mentioned in the Contract Documents. Additionally, manufacturers whose standards are less than those of the specified entity but are capable of producing an entity that meets the specified entity shall not, for the convenience of their normal production methods, vary from the specified entity standards.
8. Where test data and standards are being submitted as supporting data and for comparison with the specified item, comply with the following requirements. Submittals not complying with these provisions will be considered incomplete, unacceptable, and will be rejected:
 - a. All substitutes shall meet all of the minimum performance criteria of the specified entity.
 - b. Submit certified data provided by an independent testing laboratory.
 - c. Prepare supporting data in side-by-side tabular form showing the submitted criteria next to each specified performance criteria and denoting the differences between the specified item the substitute item.

- d. Show submitted data using same tests and standards and with the values and results in the same units of measure as those shown for the specified item.
 - e. Where a performance criterion is not listed in the specifications, comply with the specified product manufacturer's published data for performance criteria.
 - f. Where the specified entity requires certifications, registrations, approvals, policies, practices, etc., submit proof that the substitute entity is in compliance.
9. Each and all requests for substitutes shall be signed by the person making the submittal. By signing the submittal, the person requesting the substitute certifies and agrees to the following requirements. Requests without the signature of a responsible person will be rejected.
- a. That the specifications have been read and are understood,
 - b. That the entity being submitted meets or exceeds all provisions of the specifications,
 - c. That all submitted information is true and accurate,
 - d. Will remove the substitute entity and replace it with an acceptable product, at his expense, if it is determined that the substitute does not meet the specifications as certified.
 - e. Agrees to pay for all necessary design changes and increased construction costs to incorporate the substitute entity.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit by accurate field measurements before fabrication. Show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver metal fabrications to Project site in such quantities and at such times to ensure continuity of installation.
1. At delivery and prior to unloading, examine all steel for signs of thin or no shop primer. If shop-primed steel has numerous signs of improper packing, handling, or preparation, as evidenced by numerous breaks, chips, scratches, and heavily rusted areas in the shop primer, do not accept the steel. Where existing primer appears to be thin as evidenced by shadows or variegated appearance, or rust bloom, check thickness of primer with a magnetic thickness tester such as a Positester.
 2. If unloaded, staged, or erected shop-primed steel is found to have low shop-primer as described above, the Contractor shall be responsible for bringing the required surface preparation and priming to bring the shop primer thickness to the specified dry film thickness, even if the steel is erected.
- B. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms, or other supports. Handle and protect steel members and packaged materials from damage, corrosion, and deterioration. Do not erect rust steel.
1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.

2. Stack in such a manner that surface water will properly drain. If materials are to be stored for an extended period of time, cover in such a way that rain will not fall on the material, but air will flow freely through the stack.
3. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.
4. Store steel so as to be protected from mud and dirt. Remove all traces of mud and dirt prior to erecting. Mud and dirt shall be removed carefully to prevent damage to the primer.

1.7 SEQUENCING

- A. Supply anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, templates, instructions, and directions, as required, for installation.

PART 2 - PRODUCTS

2.1 FERROUS METALS

- A. Metal Surfaces, General: For metal fabrications exposed to view in the completed Work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- B. Steel Plates, Shapes, and Bars: ASTM A 36.
- C. Cast-in-Place Anchors in Concrete: Anchors of type indicated below, fabricated from corrosion-resistant materials capable of sustaining, without failure, the load imposed within a safety factor of 4, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.
 1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47 malleable iron or ASTM A 27 cast steel. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A 153.
- D. Welding Rods and Bare Electrodes: Select according to AWS specifications for the metal alloy to be welded.

2.2 PAINT

- A. Shop Primer for Ferrous Metal: Compatible with finish paint systems indicated, and capability of providing a sound foundation for field-applied topcoats despite prolonged exposure. Compatible with finish paint specified in Division 09 Section - Painting. Capable of being applied to a minimum dry film thickness of 3 mils DFT and cover surface profile created by surface preparation.

1. Interior Steel: Fast-curing, lead- and chromate-free, VOC-compliant, universal modified-alkyd primer with good resistance to normal atmospheric corrosion, complying with performance requirements of FS TT-P-664.
 2. Exterior: Hot dipped galvanized
 3. For Components Too Large To Galvanize, 1 Coat: Sherwin Williams Macropoxy High Solids B58W400 DFT white at 4 mils DFT or a reviewed substitute.
- B. Galvanizing Repair Paint: Galvilite Cold Galvanizing Repair Compound, Esterified Epoxy Based Zinc Rich Metal Primer by ZRC Worldwide or a reviewed substitute. Use to repair all damaged galvanizing. As a minimum, galvanizing repair shall comply with the following:
1. Specifications: Fed. Spec. DOD-P-21035A and Mil Spec. Mil-P-26915A
 2. Registration: ISO 9001
 3. VOC Compliant
 4. Zinc in Dried Film: 95 percent, ASTM D520 Type III
 5. Percent Solids: 52 percent by volume.
 6. Pencil Hardness: 2H per ASTM D3363
 7. UL: Recognized by UL as being equivalent to hot dipped galvanized
 8. Impact Resistance: Greater than 30 inch-lbs. per ASTM D2794
 9. Abrasion Resistance: 11.5 liters per dry mil when tested at 3 mils DFT per ASTM D98
 10. Dry Time to Touch: 20-30 minutes at 1.5 mils DFT
 11. Recoat Time: 24-48 hours

2.3 FASTENERS

- A. General: Provide plated fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating. Select fasteners for the type, grade, and class required.
1. All fasteners in an exterior application or that are in contact with wood or cementitious materials shall be galvanized in accordance with ASTM A153.
- B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A, with hex nuts, ASTM A 563, and, where indicated, flat washers.
- C. Machine Screws: ANSI B18.6.3.
- D. Lag Bolts: ANSI B18.2.1.
- E. Wood Screws: Flat head, carbon steel, ANSI B18.6.1.
- F. Plain Washers: Round, carbon steel, ANSI B18.22.1.
- G. Lock Washers: Helical, spring type, carbon steel, ANSI B18.21.1.
- H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
1. Material: Carbon steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.

2. Material: Group 1 alloy 304 or 316 stainless-steel bolts and nuts complying with ASTM F 593 and ASTM F 594.

I. Toggle Bolts: FS FF-B-588, tumble-wing type, class and style as required.

2.4 GROUT

A. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

B. Products: Subject to compliance with requirements, provide one of the following:

1. Nonshrink, Nonmetallic Grouts:

- a. B-6 Construction Grout; W. R. Bonsal Co.
- b. Diamond-Crete Grout; Concrete Service Materials Co.
- c. Supreme; Cormix Construction Chemicals.
- d. Sure-grip High Performance Grout; Dayton Superior Corp.
- e. Euco N-S Grout; Euclid Chemical Co.
- f. Five Star Grout; Five Star Products.
- g. Vibropruf #11; Lambert Corp.
- h. Crystex; L & M Construction Chemicals, Inc.
- i. Masterflow 928 and 713; Master Builders Technologies, Inc.
- j. Sealtight 588 Grout; W. R. Meadows, Inc.
- k. SonogROUT 14; Sonneborn Building Products--ChemRex, Inc.
- l. Kemset; The Spray-Cure Company.

2.5 FABRICATION, GENERAL

A. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.

B. Galvanize all ferrous metal

1. In contact with concrete, masonry, earth
2. Used for exterior applications
3. Bearing plates for joists, beams, and lintels in masonry walls.

C. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

D. Allow for thermal movement resulting from the following maximum change (range) in ambient temperature in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening up of joints, and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.

1. Temperature Change (Range): 100 deg F.

- E. Shear and punch metals cleanly and accurately. Remove burrs.
- F. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- G. Remove sharp or rough areas on exposed traffic surfaces.
- H. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.
- I. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.
- J. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- K. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- L. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- M. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

2.6 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of the required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.

2.7 LOOSE STEEL LINTELS

- A. Fabricate loose structural steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated.
- B. Weld adjoining members together to form a single unit where indicated.

- C. Size loose lintels for equal bearing of 1 inch per foot of clear span but not less than 8 inches bearing at each side of openings, unless otherwise indicated.

2.8 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports for applications indicated that are not a part of structural steel framework as required to complete the Work.
- B. Fabricate units to sizes, shapes, and profiles indicated and required to receive other adjacent construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items.
 - 1. Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed.
 - a. Except as otherwise indicated, space anchors 24 inches o.c. and provide minimum anchor units in the form of steel straps 1-1/4 inches wide by 1/4 inch thick by 8 inches long.

2.9 MISCELLANEOUS STEEL TRIM

- A. Unless otherwise indicated, fabricate units from structural steel shapes, plates, and bars of profiles shown with continuously welded joints, and smooth exposed edges. Miter corners and use concealed field splices wherever possible.
- B. Provide cutouts, fittings, and anchorages as required to coordinate assembly and installation with other work. Provide anchors, welded to trim, for embedding in concrete or masonry construction, spaced not more than 6 inches from each end, 6 inches from corners, and 24 inches o.c., unless otherwise indicated.

2.10 LADDERS

- A. Steel Ladders, Vertical
 - 1. Fabricate to dimensions and shapes detailed. Coat each rung with aluminum-oxide granules set in epoxy-resin adhesive to provide slip-resistant rungs. If not detailed then fabricate as follows:
 - a. General: Fabricate ladders for the locations shown, with dimensions, spacings, details, and anchorages as indicated. Comply with requirements of ANSI A14.3.
 - b. Siderails: Continuous, steel, 1/2-by-2-1/2-inch flat bars, with eased edges, spaced 18 inches apart.
 - c. Bar Rungs: 3/4-inch- diameter steel bars, spaced 12 inches o.c.
 - d. Fit rungs in centerline of side rails, plug weld and grind smooth on outer rail faces.
 - e. Support each ladder at top and bottom and at intermediate points spaced not more than 60 inches o.c. with welded or bolted steel brackets.
 - 1) Size brackets to support design dead and live loads indicated and to hold centerline of ladder rungs clear of the wall surface by not less than 7 inches.
 - 2) Extend side rails 42 inches above top rung, and return rails to wall or structure unless other secure handholds are provided. If the adjacent

structure does not extend above the top rung, goose-neck the extended rails back to the structure to provide secure ladder access.

- f. Provide nonslip surfaces on top of each rung by coating with abrasive material metallically bonded to the rung by a proprietary process such as one of the following:
 - 1) Mebac, IKG Borden.
 - 2) SLIP-NOT, W. S. Molnar Co.

B. Aluminum Ladders

1. Fabricate to dimensions and shapes detailed.. If not detailed then fabricate as follows:
 - a. General: Fabricate ladders for the locations shown, with dimensions, spacings, details, and anchorages as indicated. Comply with requirements of ANSI A14.3.
 - b. Siderails: Continuous, aluminum 1/2-by-2-1/2-inch flat bars, with eased edges, spaced 20-1/4 inches apart.
 - c. Bar Rungs: 1-1/4 -inch- diameter steel bars, spaced 12 inches o.c.
 - d. Fit rungs in centerline of side rails, and secure with 4 aircraft rivets each having a shear strength of 900 pounds. Grind smooth on outer rail faces.
 - e. Mounting Brackets: 1/8-inch thick aluminum. Support each ladder at top and bottom and at intermediate points spaced as indicated. If not indicated, then space 60 inches o.c..
 - 1) Size brackets to support design dead and live loads indicated and to hold centerline of ladder rungs clear of the wall surface by not less than 7 inches.
 - f. Platform: When indicated on the Drawings:
 - 1.) Mill finish aluminum.
 - 2.) Floor: Grip strut floor
 - 3.) Toe Boards: 0.063 thick x 4 inches wide.
 - 4.) Railings: 1-1/4 inch round aluminum with serrated surface and cast aluminum finish.

2.11 FINISHES, GENERAL

- A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applying and designing finishes.
- B. Finish metal fabrications after assembly.
- C. Hot-dip galvanize all ferrous metal in exterior locations, in exterior walls, and in contact with cementitious or masonry construction, or with treated wood.

2.16 SHOP PRIMING

- A. Shop prime steel surfaces not galvanized except the following:
 1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
 2. Surfaces to be field welded.
 3. Surfaces to be high-strength bolted with slip-critical connections.
 4. Surfaces to receive sprayed-on fireproofing.
 5. Galvanized surfaces.
 6. Faying surfaces.

- B. Preparation for Shop Priming: Clean surfaces to be painted. Remove loose rust, loose mill scale, and spatter, slag, or flux deposits. Prepare uncoated ferrous metal surfaces to comply with requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:.
1. Exteriors (SSPC Zone 1B): SSPC-SP 2 "Solvent Cleaning." followed by SSPC-SP 6 "Commercial Blast Cleaning" for metals to be galvanized, and metals scheduled for exterior use ."
 2. Interiors (SSPC Zone 1A): SSPC-SP 2 "Solvent Cleaning." followed by SSPC-SP 3 "Power Tool Cleaning."
- C. Shop Priming
1. Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finishes or to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with requirements of SSPC-PA 1 "Paint Application Specification No. 1" for shop painting. Apply shop primer to cover profile of surface preparation.
 2. Immediately after surface preparation, apply primer according to manufacturer's instructions and at rate recommended by SSPC to provide a dry film thickness of not less than 3.0 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
 3. Do not allow prepared and cleaned surfaces to remain unprimed over night or for longer than 8 hours before priming. Surfaces not primed within these parameters shall be recleaned prior to priming.
 4. Stripe paint corners, crevices, bolts, rivets, welds, and edges. Spray all Bolts and rivets from at least 4 different angles. Cover all sides of rivets and bolts equally.
 5. Apply 2 coats of shop paint to inaccessible surfaces after assembly or erection. Change color of second coat to distinguish it from first.
- D. Galvanizing: For those items indicated for galvanizing, apply zinc coating by the hot-dip process complying with the following requirements.
1. ASTM A 153 for galvanizing iron and steel hardware.
 2. ASTM A 123 for galvanizing both fabricated and unfabricated iron and steel products made of uncoated rolled, pressed, and forged shapes, plates, bars, and strip 0.0299 inch thick or thicker.
 3. Galvanize steel and fasteners in the following conditions:
 - a. Where indicated
 - b. All steel that will be exterior or in exterior walls.
 4. Prepare all surfaces to be galvanized according to SSPC SP6 – Commercial Blast.
- E. Steel that arrives on site with rusted or damaged surfaces may be inferred as improper handling, surface preparation, or shop priming and will be corrected at the fabricator's expense or may be rejected if rusting is excessive. The General Contractor shall be responsible for all steel that is accepted with rusting or damaged surfaces.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installing anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.
- B. Set sleeves in concrete with tops flush with finish surface elevations. Protect sleeves from water and concrete entry.

3.2 INSTALLATION, GENERAL

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction. Include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.
- B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- C. Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.
- D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop-welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units that have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.
- E. Shelf Angles:
 - 1. Attach shelf angles to structural members. Do not attach shelf angles to steel studs.
 - 2. Break shelf angles at all corners where building expansion joints and masonry control joints will be installed. Do not extend shelf angle through expansion and control joints.
- F. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.
- G. Roof Penetration Framing: Provide and install permanent bracing and supports around all roof penetrations that are 12 inches in diameter or greater.
- H. Aluminum Ladders
 - 1. Use aluminum vertical ladders in exterior installations and elsewhere as indicated.

2. General: Use heavy mastic or thin gasket material to separate aluminum mounting brackets from masonry. Apply mastic to aluminum surfaces in contact with the masonry, and allow mastic to dry prior to joining. Do not apply mastic to masonry.
 3. Install ship's ladder where shown according to the manufacturer's instructions. Ensure that the ladder is anchored securely and to the recommended angle.
- I. Back Priming: For all unprimed steel and steel with damaged primer or galvanizing, back prime, including all edges and concealed surfaces, of all ferrous and galvanized metal prior to installation. Apply primer to the same specifications as for the exposed surfaces. Treat all cut edges, end cuts, welds, and otherwise disturbed surfaces in the same way. Ferrous items shall be completely encapsulated with primer. Installed items not back-primed shall be removed, properly primed, and reinstalled at the Contractor's expense. Damaged materials shall be replaced. This provision applies to all ferrous and galvanized steel that is installed in exterior locations, in unconditioned spaces, and that are in contact with wood or cementitious materials. However, do not prime faying surfaces, surfaces that are to receive sprayed fire proofing, or other scheduled or noted surfaces not to be primed. Comply with surface preparation and priming specified in Section 099113 – Exterior Painting or 099123 – Interior Painting, as appropriate.
1. Protect primed and finished steel that is in contact with masonry and cementitious surfaces from abrasion and corrosion caused by alkali action. Protection shall not interfere with rigidity of installation.

3.3 SETTING LOOSE PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.
- B. Set loose leveling and bearing plates on wedges or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut off flush with the edge of the bearing plate before packing with nonshrink, nonmetallic grout.
 1. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and primer damaged during handling and erection. Apply paint to exposed areas using same material as used for shop painting. Perform all surface preparation and priming as described for shop performed surface preparation and priming in Part 2 of this specification.
 1. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and apply galvanizing repair paint according to ASTM A 780. Perform all surface preparation as described for shop performed surface preparation in Part 2 of this specification.

END OF SECTION 05 50 00

SECTION 05 52 13 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Exterior steel pipe and tube railings.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Handrails and Top Rails of Guards:
 - a. Uniform load of 50 lbf/ ft. applied in any direction.
 - b. Concentrated load of 200 lbf applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 2. Infill of Guards:
 - a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
 - b. Infill load and other loads need not be assumed to act concurrently.
- B. Thermal Movements: Provide exterior railings that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.4 SUBMITTALS

- A. Product Data: For the following:

1. Grout and anchoring cement.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

C. Welding certificates.

1.5 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.7 COORDINATION AND SCHEDULING

A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

B. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

PART 2 - PRODUCTS

2.1 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

2.2 STEEL AND IRON

A. Tubing: ASTM A 500 (cold formed) or ASTM A 513, Type 5 (mandrel drawn).

B. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

2.3 FASTENERS

- A. General: Provide the following:
 - 1. Steel Railings: Plated steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated.
- C. Fasteners for Interconnecting Railing Components:
 - 1. Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
- D. Anchors: Provide cast-in-place chemical or torque-controlled expansion anchors, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in 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.

2.4 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.
- D. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- E. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.
 - 1. Water-Resistant Product: At exterior locations and where indicated provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.5 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage.

- B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Make up wire-rope assemblies in the shop to field-measured dimensions with fittings machine swaged. Minimize amount of turnbuckle take-up used for dimensional adjustment so maximum amount is available for tensioning wire ropes. Tag wire-rope assemblies and fittings to identify installation locations and orientations for coordinated installation.
- E. Form work true to line and level with accurate angles and surfaces.
- F. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- G. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- H. Connections: Fabricate railings with welded connections, unless otherwise indicated.
- I. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove flux immediately.
 - 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- J. Form changes in direction as follows:
 - 1. By bending.
- K. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- L. Close exposed ends of railing members with prefabricated end fittings.
- M. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- N. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated.

- O. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.
- P. For railing posts set in concrete, provide steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with steel plate forming bottom closure.

2.6 STEEL AND IRON FINISHES

- A. Galvanized Railings:
 - 1. Hot-dip galvanize exterior steel and iron railings, including hardware, after fabrication.
 - 2. Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
 - 3. Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.
 - 4. Fill vent and drain holes that will be exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 - 1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- C. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- D. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.2 RAILING CONNECTIONS

- A. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in Part 2 "Fabrication" Article whether welding is performed in the shop or in the field.
- B. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2

inches beyond joint on either side, fasten internal sleeve securely to 1 side, and locate joint within 6 inches of post.

3.3 ATTACHING HANDRAILS TO WALLS

- A. Attach handrails to wall with wall brackets. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface.
 - 1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
- B. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- C. Secure wall brackets to building construction as follows:
 - 1. For solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 - 2. For hollow masonry anchorage, use toggle bolts.

3.4 ANCHORING POSTS

- A. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.
- C. Leave anchorage joint exposed; wipe off surplus anchoring material; and leave 1/8-inch buildup, sloped away from post.

3.5 ADJUSTING AND CLEANING

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

3.6 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

END OF SECTION 05 52 13

SECTION 07 21 00 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Polyisocyanurate foam-plastic board.
 - 2. Polyurethane spray insulation at window gaps and ganged studs and headers.
- B. Related Requirements:
 - 1. Section 092900 "Gypsum Board" for sound attenuation blanket used as acoustic insulation.
 - 2. Section 133419 "Metal Building Systems" for insulation specified as part of metal building system.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for insulation products.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of building insulation through one source.
- B. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
 - 1. Surface-Burning Characteristics: ASTM E 84.
 - 2. Fire-Resistance Ratings: ASTM E 119.
 - 3. Combustion Characteristics: ASTM E 136.

- C. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect foam-plastic board insulation as follows:
 - 1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site until just before installation time.
 - 3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 POLYISOCYANURATE FOAM-PLASTIC BOARD

- A. Polyisocyanurate Board, Foil Faced: ASTM C 1289, foil faced, Type I, Class 1 or 2.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Atlas Roofing Corporation.
 - b. Dow Chemical Company; Thermax.
 - c. Hunter Panels.
 - d. Rmax, Inc.
 - 2. Fire Propagation Characteristics: Passes NFPA 285 testing as part of an approved assembly.

2.2 POLYURETHANE SPRAY INSULATION (FOR FILLING GAPS)

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. DAP, Inc.; DAP Kwik Foam.
 - 2. Dow; Great Stuff Pro.
 - 3. Hilti, Inc.; CF-128-DW Polyurethane Insulating Foam.
- B. Polyurethane Spray Insulation: One-component, moisture-cure, polyurethane insulating foam for filling gaps; waterproof, sandable and paintable.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for Sections in which substrates and related work are specified and other conditions affecting performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of substances harmful to insulations, including removing projections capable of interfering with insulation attachment.
- B. Install sealer gaskets to isolate the underside of wall bottom track or rim track and the top of foundation wall or slab at stud or joist locations.

3.3 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

3.4 INSTALLATION OF CONTINUOUS WALL INSULATION

- A. Compliance with NFPA 285: Install the following continuous insulation type in compliance with R-value requirements indicated on Drawings and in accordance with assembly testing requirements of NFPA 285:
 - 1. Polyisocyanurate Board, Foil Faced.
- B. Apply continuous insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units. Coordinate installation of insulation with Division 07 Section "Fluid Applied Membrane Air Barriers".
 - 1. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Section 042200 "Concrete Unit Masonry."
- C. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 - 1. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.5 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

SECTION 07 27 26 – FLUID APPLIED MEMBRANE AIR BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes fluid-applied, vapor-permeable membrane air barriers.
- B. Related Sections include the following:
 - 1. Division 04 Section "Concrete Unit Masonry" for requirements for exterior masonry.
 - 2. Division 06 Section "Sheathing" for sheathing substrates.
 - 3. Division 07 Section "Joint Sealants" for joint-sealant materials and installation.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Air barrier shall be capable of performing as a continuous vapor-retarding air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.
- B. Air Barrier Assembly Air Leakage: Not to exceed 0.01 cfm x sq. ft. of surface area at 1.57 lbf/sq. ft.; ASTM E 283.
- C. Structural (Wind and Axial Loads):
 - 1. Design for maximum allowable deflection normal to the plane of the wall: L/240.
 - 2. Design for wind load in conformance with code requirements. Consult applicable code compliance report.
- D. Moisture Control: Design and install system to prevent accumulation of water into or behind the exterior wall assembly.
 - 1. Minimize condensation within the assembly.
 - 2. Drain water directly to the exterior where it is likely to penetrate components in the wall assembly (i.e., windows and doors).
 - 3. Provide flashing to direct water to the exterior in accordance with code requirements, including, above window and door heads, beneath window and door sills, at roof/wall intersections, decks, intersections of lower walls with higher walls, and at the base of the wall.

- E. Air Barrier Continuity: Provide continuous air barrier system of compatible air barrier components.
- F. Mechanical Ventilation: Maintain pressurization and indoor humidity levels in accordance with recommendations of ASHRAE 2001 Handbook – Fundamentals.

1.4 SUBMITTALS

- A. Product Data: Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of air barrier.
- B. Shop Drawings: Include details for substrate joints and cracks, counterflashing strip, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
 - 1. Include details of interfaces with other materials that form part of air barrier.
 - 2. Include details of mockups.
- C. Product Certificates: For air barriers, certifying compatibility of air barrier and accessory materials with Project materials that connect to or that come in contact with the barrier; signed by product manufacturer.
- D. Qualification Data: For Applicator.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for air barriers and related materials.
 - 1. Materials forming substrates and transitions shall be tested for compatibility and adhesion with air barrier materials and sealants.

1.5 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm experienced in applying air barrier materials similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Mockups: Before beginning installation of air barrier, build mockups of exterior wall assembly as specified in Division 04 Section "Unit Masonry."
 - 1. Coordinate construction of mockup to permit inspection by Architect of air barrier before external insulation and cladding is installed.
- C. Preinstallation Conference: Conduct conference at Project site.
 - 1. Include installers of other construction connecting to air barrier, including roofing, waterproofing, masonry, sealants, windows, glazed curtain walls, and door frames.
 - 2. Review air barrier requirements including surface preparation, substrate condition and pretreatment, minimum substrate curing period, forecasted weather conditions, special details and sheet flashings, mockups, installation procedures, sequence of installation, testing and inspecting procedures, and protection and repairs.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store liquid materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by air barrier manufacturer.
- B. Remove and replace liquid materials that cannot be applied within their stated shelf life.
- C. Store rolls according to manufacturer's written instructions.
- D. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air barrier manufacturer. Protect substrates from environmental conditions that affect performance of air barrier. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

1.8 COORDINATION AND SCHEDULING

- A. Coordinate installation of foundation waterproofing, roofing membrane, windows, doors and other wall penetrations to provide a continuous air barrier.
- B. Provide protection of rough openings before installing windows, doors, and other penetrations through the wall.
- C. Provide sill flashing to direct water to the exterior before windows and doors are installed.
- D. Install window and door head flashing immediately after windows and doors are installed.
- E. Install diverter flashings wherever water can enter the assembly to direct water to the exterior.

PART 2 - PRODUCTS

2.1 VAPOR-PERMEABLE MEMBRANE AIR-BARRIER

- A. Fluid-Applied, Vapor-Permeable Membrane Air Barrier: Synthetic polymer membrane.
 - 1. Basis-of-Design Products: Subject to compliance with requirements, provide **Air-Shield LMP by W.R. Meadows, Inc.** or comparable product by one of the following:
 - a. Synthetic Polymer Membrane:
 - 1) Carlisle Coatings & Waterproofing Inc.
 - 2) Henry Company.
 - 3) Tremco Incorporated, an RPM company.

2. Physical and Performance Properties:

- a. Air Permeance: Maximum 0.004 cfm/sq. ft. of surface area at 1.57-lbf/sq. ft. pressure difference; ASTM E 2178.
- b. Vapor Permeance: Minimum 10 perms; ASTM E 96/E 96M.
- c. Ultimate Elongation: Minimum 200 percent; ASTM D 412, Die C.
- d. Flame Spread and Smoke Development, ASTM E84: Class A.

2.2 AUXILIARY MATERIALS

- A. General: Auxiliary materials recommended by air barrier manufacturer for intended use and compatible with air barrier membrane, flashings, sealants, insulation and other building envelope materials. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- B. Compatibility: Provide air barrier materials, flashings, and other related materials that are compatible with one another and with substrates under conditions of service and application, as demonstrated by manufacturer, based on testing and field experience.
- C. Primer: Liquid non-asphaltic primer recommended for substrate by manufacturer of air barrier material.
- D. Flexible Flashing at Transitions in Substrate and Connections to Adjacent Elements: Self-adhesive polymeric membrane as specifically approved by air barrier manufacturer:
- E. Sealant at Transitions in Substrate and Connections to Adjacent Elements: Low-modulus pre-cured silicone extrusion and sealant for bonding extrusions to substrates.
- F. Substrate Patching Membrane: Manufacturer's standard trowel-grade substrate filler.
- G. Adhesive and Tape: Air barrier manufacturer's standard non-asphaltic adhesive and pressure-sensitive adhesive tape.
- H. Sprayed Polyurethane Foam Sealant: 1- or 2-component, foamed-in-place, polyurethane foam sealant, 1.5 to 2.0 lb/cu. ft density; flame spread index of 25 or less according to ASTM E 162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.
- I. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low-modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Division 07 Section "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance.

1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Clean, prepare, treat, and seal substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- E. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

3.3 TRANSITION STRIP INSTALLATION

- A. Install strips, transition strips, and auxiliary materials according to air barrier manufacturer's written instructions to form a seal with adjacent construction and maintain a continuous air barrier.
 1. Coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by fluid air-barrier material on same day. Reprime areas exposed for more than 24 hours.
 1. Prime glass-fiber-surfaced gypsum sheathing with number of prime coats needed to achieve required bond, with adequate drying time between coats.
- C. Connect and seal exterior wall air barrier membrane continuously to roofing membrane air barrier, concrete below-grade structures, floor-to floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- D. At end of each working day, seal top edge of strips and transition strips to substrate with termination mastic.
- E. Apply joint sealants forming part of air barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

- F. Wall Openings: Prime concealed perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply transition strip so that a minimum of 3 inches of coverage is achieved over both substrates. Maintain 3 inches of full contact over firm bearing to perimeter frames with not less than 1 inch of full contact.
- G. Fill gaps in perimeter frame surfaces of windows, curtain walls, storefronts, and doors, and miscellaneous penetrations of air barrier membrane with foam sealant.
- H. Seal strips and transition strips around masonry reinforcing or ties and penetrations with termination mastic.
- I. Seal top of through-wall flashings to air barrier with an additional 6-inch- wide, flashing strip.
- J. Seal exposed edges of strips at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with termination mastic.
- K. Repair punctures, voids, and deficient lapped seams in strips and transition strips. Slit and flatten fishmouths and blisters. Patch with transition strips extending 6 inches beyond repaired areas in strip direction.

3.4 AIR BARRIER MEMBRANE INSTALLATION

- A. Apply air barrier membrane to form a seal with strips and transition strips and to achieve a continuous air barrier according to air barrier manufacturer's written instructions.
- B. Apply air barrier membrane within manufacturer's recommended application temperature ranges.
- C. Apply primer to substrates at required rate and allow to dry. Limit priming to areas that will be covered by air barrier sheet in same day. Reprime areas exposed for more than 24 hours.
- D. Membrane Air Barriers: Apply a continuous unbroken air-barrier membrane to substrates according to the following thickness. Apply air-barrier membrane in full contact around protrusions such as masonry ties.
 - 1. Vapor-Permeable Membrane Air Barrier: Total dry film thickness as recommended in writing by manufacturer to meet performance requirements, but not less than 47-mil dry film thickness, applied in one or more equal coats.
- E. Apply strip and transition strip a minimum of 1 inch onto cured air membrane or strip and transition strip over cured air membrane overlapping 3 inches onto each surface according to air barrier manufacturer's written instructions.
- F. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.
- G. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air barrier components.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform inspections and prepare test reports.
- B. Inspections: Air barrier materials and installation are subject to inspection for compliance with requirements. Inspections may include the following:
 - 1. Continuity of air barrier system has been achieved throughout the building envelope with no gaps or holes.
 - 2. Continuous structural support of air barrier system has been provided.
 - 3. Masonry and concrete surfaces are smooth, clean and free of cavities, protrusions, and mortar droppings.
 - 4. Site conditions for application temperature and dryness of substrates have been maintained.
 - 5. Maximum exposure time of materials to UV deterioration has not been exceeded.
 - 6. Surfaces have been primed, if applicable.
 - 7. Laps in strips and transition strips have complied with minimum requirements and have been shingled in the correct direction (or mastic has been applied on exposed edges), with no fishmouths.
 - 8. Termination mastic has been applied on cut edges.
 - 9. Strips and transition strips have been firmly adhered to substrate.
 - 10. Compatible materials have been used.
 - 11. Transitions at changes in direction and structural support at gaps have been provided.
 - 12. Connections between assemblies (membrane and sealants) have complied with requirements for cleanliness, preparation and priming of surfaces, structural support, integrity, and continuity of seal.
 - 13. All penetrations have been sealed.
- C. Remove and replace deficient air barrier components and retest as specified above.

3.6 CLEANING AND PROTECTION

- A. Protect air barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
 - 1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. Remove and replace air barrier exposed for more than 60 Insert number days.
 - 2. Protect air barrier from contact with asphalt, creosote, uncured coal-tar products, and sealants not approved by air barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.
- C. Remove masking materials after installation.

END OF SECTION 07 27 26

SECTION 07 72 00 - ROOF ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Roof hatches.
- B. Related Sections:
 - 1. Section 055000 "Metal Fabrications" for metal ladders.
 - 2. Section 133419 "Metal Building Systems" for metal roof panels.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, materials, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: Show fabrication and installation details. Indicate dimensions, weights, loadings, required clearances, method of field assembly, and components. Include plans, elevations, sections, details, and attachments to other Work.
- C. Coordination Drawings: Roof plans drawn to scale and coordinating penetrations and roof-mounted items. Show the following:
 - 1. Size and location of roof accessories specified in this Section.
 - 2. Method of attaching roof accessories to roof or building structure.
 - 3. Other roof-mounted items including mechanical and electrical equipment, ductwork, piping, and conduit.

1.4 QUALITY ASSURANCE

- A. Standards: Comply with the following:
 - 1. SMACNA's "Architectural Sheet Metal Manual" details for fabrication of units, including flanges and cap flashing to coordinate with type of roofing indicated.
 - 2. NRCA's "Roofing and Waterproofing Manual" details for installing units.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof accessories shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.

2.2 MATERIALS, GENERAL

- A. General: Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187/D 1187M.
- C. Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other noncorrosive metal as recommended by manufacturer. Match finish of exposed fasteners with finish of material being fastened.
- D. Elastomeric Sealant: Generic type recommended by unit manufacturer that is compatible with joint surfaces; ASTM C 920, Type S, Grade NS, Class 25, and Uses NT, G, A, and, as applicable to joint substrates indicated, O.
- E. Roofing Cement: ASTM D 4586, nonasbestos, fibrated asphalt cement designed for trowel application or other adhesive compatible with roofing system.

2.3 ROOF HATCHES

- A. Roof Hatches: Fabricate roof hatches with insulated double-wall lids and insulated double-wall curb frame with integral deck mounting flange and lid frame counterflashing. Fabricate with welded or mechanically fastened and sealed corner joints. Provide continuous weathertight perimeter gasketing and equip with corrosion-resistant or hot-dip galvanized hardware.
 - 1. Manufacturers:
 - a. Babcock-Davis.
 - b. Bilco Company – Type E (Basis of Design).
 - c. J. L. Industries, Inc.
 - d. Nystrom, Inc.
 - 2. Loads: As determined by Structural Engineer.
 - 3. Types and Sizes:
 - a. Single-leaf lid, 36 by 36 inches for ladder access.
 - 4. Hatch Lid: Opaque, insulated, and double walled, with manufacturer's standard metal liner of same material and finish as outer metal lid.
 - a. Finish: Baked enamel or powder coat.
 - b. Color: As selected by Architect from manufacturer's full range.

5. Insulation: 1-inch thick glass fiber board.
6. Interior Lid Liner: Manufacturer's standard metal liner of same material and finish as outer metal lid.
7. Exterior Curb Liner: Manufacturer's standard metal liner of same material and finish as metal curb.
8. Fabricate units to minimum height of 12 inches, unless otherwise indicated.
9. Hardware: Stainless-steel spring latch with turn handles, butt- or pintle-type hinge system, and padlock hasps inside and outside.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of work.
 1. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored and is ready to receive roof accessories.
 2. Verify dimensions of roof openings for roof accessories.
 3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install roof accessories according to manufacturer's written instructions. Anchor roof accessories securely in place and capable of resisting forces specified. Use fasteners, separators, sealants, and other miscellaneous items as required for completing roof accessory installation. Install roof accessories to resist exposure to weather without failing, rattling, leaking, and fastener disengagement.
- B. Install roof accessories to fit substrates and to result in watertight performance.
- C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 1. Coat concealed side of uncoated aluminum roof accessories with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing exposed-to-view components of roof accessories directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet, or install a course of polyethylene underlayment.
 3. Bed flanges in thick coat of asphalt roofing cement where required by roof accessory manufacturers for waterproof performance.
- D. Install roof accessories level, plumb, true to line and elevation, and without warping, jogs in alignment, excessive oil canning, buckling, or tool marks.
- E. Roof Hatch Installation:
 1. Check roof hatch for proper operation. Adjust operating mechanism as required. Clean and lubricate joints and hardware.

- F. Seal joints with butyl sealant as required by manufacturer of roof accessories.

3.3 REPAIR AND CLEANING

- A. Clean exposed surfaces according to manufacturer's written instructions.
- B. Clean off excess sealants.
- C. Replace roof accessories that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 07 72 00

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Silicone joint sealants.
 - 2. Urethane joint sealants.
 - 3. Silyl-terminated polyether joint sealants.
 - 4. Mildew-resistant joint sealants.
 - 5. Butyl joint sealants.
 - 6. Latex joint sealants.
 - 7. Acoustical joint sealants.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified testing agency.
- B. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency.

- C. Preconstruction Laboratory Test Schedule: Include the following information for each joint sealant and substrate material to be tested:
 - 1. Joint-sealant location and designation.
 - 2. Manufacturer and product name.
 - 3. Type of substrate material.
 - 4. Proposed test.
 - 5. Number of samples required.
- D. Preconstruction Laboratory Test Reports: From sealant manufacturer, indicating the following:
 - 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 - 2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.
- E. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
- B. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Adhesion Testing: Use ASTM C 794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Compatibility Testing: Use ASTM C 1087 to determine sealant compatibility when in contact with glazing and gasket materials.
 - 3. Stain Testing: Use ASTM C 1248 to determine stain potential of sealant when in contact with masonry substrates.
 - 4. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.
 - 5. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 6. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
 - 7. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.

1.8 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.9 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period for Silicone Sealants: 20 years from date of Substantial Completion.
 2. Warranty Period for Urethane Sealants: 5 years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 2. Disintegration of joint substrates from causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 100/50, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.

1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
 - a. Dow Corning Corporation.
 - b. **GE Construction Sealants; Momenive Performance Materials Inc.**
 - c. Pecora Corporation.
 - d. **Sika Corporation.**
 - e. Tremco Incorporated.

2.3 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.

1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
 - a. **BASF Corporation-Construction Systems.**
 - b. Pecora Corporation.
 - c. **Polymeric Systems, Inc.**
 - d. **Sika Corporation.**
 - e. **Tremco Incorporated.**

- B. Pourable Urethane, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade P, Class 25, Uses T and NT.

1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
 - a. **BASF Corporation-Construction Systems.**
 - b. Pecora Corporation.
 - c. **Polymeric Systems, Inc.**
 - d. **Sika Corporation.**
 - e. Tremco Incorporated.

- C. Urethane, M, NS, 25, NT: Multicomponent, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, urethane joint sealant; ASTM C 920, Type M, Grade NS, Class 25, Use NT.

1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
 - a. **BASF Corporation-Construction Systems.**
 - b. Pecora Corporation.
 - c. **Polymeric Systems, Inc.**
 - d. **Sika Corporation.**
 - e. Tremco Incorporated.

2.4 SILYL-TERMINATED POLYETHER (STPE) JOINT SEALANTS

- A. STPE, S, NS, 35, NT: Single-component, nonsag, plus 35 percent and minus 35 percent movement capability, nontraffic-use, silyl-terminated polyether joint sealant; ASTM C 920, Type S, Grade NS, Class 35, Use NT.
1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
 - a. **BASF Corporation-Construction Systems.**
 - b. **Pecora Corporation.**
 - c. **Sherwin-Williams Company (The).**
 - d. **Tremco Incorporated.**

2.5 POLYETHER (PE) JOINT SEALANTS

- A. Polyether Sealant: Polyether based, moisture curing, elastomeric, sealant; non-shrinking, 100% solids, moisture-cure polymer, solvent-free.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. York Manufacturing, Inc.; UniverSeal US-100.
 - b. ChemLink; M-1 Structural Adhesive/Sealant.
 - c. STS Coatings: Great Seal LT-100.

2.6 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.
1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
 - a. **Dow Corning Corporation.**
 - b. **GE Construction Sealants; Momenive Performance Materials Inc.**
 - c. **Tremco Incorporated.**

2.7 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
 - a. **BASF Corporation-Construction Systems.**
 - b. **Pecora Corporation.**

- c. **Sherwin-Williams Company (The).**
- d. **Tremco Incorporated.**

2.8 ACOUSTICAL JOINT SEALANTS

- A. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex acoustical sealant complying with ASTM C 834.
 - 1. **Products:** Subject to compliance with requirements, provide one of the following:
 - a. **Pecora Corporation;** AC-20 FTR.
 - b. **USG Corporation;** SHEETROCK Acoustical Sealant.
 - 2. **Colors of Exposed Acoustical Joint Sealants:** As selected by Architect from manufacturer's full range of colors.
- B. Primer: Material recommended by acoustical-joint-sealant manufacturer where required for adhesion of sealant to joint substrates.
- C. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials.
- D. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

2.9 JOINT-SEALANT BACKING

- A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
 - 1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
 - a. **BASF Corporation-Construction Systems.**
 - b. **Construction Foam Products; a division of Nomaco, Inc.**
 - B. **Cylindrical Sealant Backings:** ASTM C 1330, Type C (closed-cell material with a surface skin), Type B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - C. **Bond-Breaker Tape:** Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.10 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests.

- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - d. Exterior insulation and finish systems.
 - 3. Remove laitance and form-release agents from concrete.
 - 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to

comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 INSTALLATION OF ACOUSTICAL JOINT SEALANTS

- A. Comply with acoustical joint-sealant manufacturer's written installation instructions unless more stringent requirements apply.

- B. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical joint sealant. Install acoustical joint sealants at both faces of partitions, at perimeters, and through penetrations. Comply with ASTM C 919, ASTM C 1193, and manufacturer's written recommendations for closing off sound-flanking paths around or through assemblies, including sealing partitions to underside of floor slabs above acoustical ceilings.
- C. Acoustical Ceiling Areas: Apply acoustical joint sealant at perimeter edge moldings of acoustical ceiling areas in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.
 - 1. Joint Locations:
 - a. Isolation and contraction joints in cast-in-place concrete slabs.
 - b. Joints between different materials listed above.
 - c. Other traffic joints as indicated on Drawings.
 - 2. Joint Sealant: Pourable Urethane, S, P, 25, T, NT.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
 - 1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Control and expansion joints in unit masonry.
 - c. Joints between metal panels.
 - d. Joints between different materials listed above.
 - e. Perimeter joints between materials listed above and frames of doors, windows and louvers.
 - f. Control and expansion joints in ceilings and other overhead surfaces.
 - g. Other exterior joints as indicated on Drawings.

2. Joint Sealant: Single-component neutral-curing silicone sealant or multi-component nonsag urethane sealant, as recommended by manufacturer.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
1. Joint Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 - b. Control and expansion joints in tile flooring.
 - c. Other joints as indicated on Drawings.
 2. Joint Sealant: Pourable Urethane, S, P, 25, T, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- D. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Tile control and expansion joints.
 - c. Vertical joints on exposed surfaces of unit masonry walls and partitions.
 - d. Other joints as indicated on Drawings.
 2. Joint Sealant: Single-component neutral-curing silicone sealant or single component nonsag urethane sealant, as recommended by manufacturer.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- E. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.
1. Joint Locations:
 - a. Perimeter joints between interior wall surfaces and casework.
 - b. Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.
 - c. Other non-dynamic interior joints as indicated on Drawings.
 2. Joint Sealant: Acrylic latex.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- F. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Tile control and expansion joints in wet areas, where indicated.
 - c. Other joints as indicated on Drawings.
 2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

- G. Joint Sealant Application: Interior acoustical joints in vertical surfaces and horizontal nontraffic surfaces:
1. Joint Location: Acoustical joints where indicated.
 2. Joint Sealant: Acoustical.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

END OF SECTION 07 92 00

SECTION 08 11 13 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes hollow-metal work.
- B. Related Requirements:
 - 1. Section 087100 "Door Hardware" for door hardware for hollow-metal doors.

1.3 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.4 COORDINATION

- A. Coordinate anchorage installation for hollow-metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, core descriptions, and finishes.
- B. Shop Drawings: Include the following:
 - 1. Elevations of each door type.
 - 2. Details of doors, including vertical- and horizontal-edge details and metal thicknesses.
 - 3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
 - 4. Locations of reinforcement and preparations for hardware.

5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.
9. Details of conduit and preparations for power, signal, and control systems.

- C. Schedule: Provide a schedule of hollow-metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.7 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For each type of hollow-metal door and frame assembly, for tests performed by a qualified testing agency.
- B. Certification of Thermal Performance: For exterior, thermal rated assemblies, provide certification that thermal performance complies with Section 5 of ASHRAE/IESNA Standard 90.1.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow-metal work palletized, packaged, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
1. Provide additional protection to prevent damage to factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow-metal work vertically under cover at Project site with head up. Place on minimum 4-inch-high wood blocking. Provide minimum 1/4-inch space between each stacked door to permit air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain hollow-metal work from single source from single manufacturer.

2.2 INTERIOR DOORS AND FRAMES

- A. Construct interior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3.

1. Physical Performance: Level A according to SDI A250.4.
2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches.
 - c. Face: Uncoated, cold-rolled steel sheet, minimum thickness of 0.053 inch (16 gauge).
 - d. Edge Construction: Model 2, Seamless.
 - e. Core: Manufacturer's standard kraft-paper honeycomb, polystyrene, polyurethane, polyisocyanurate, or mineral-board core at manufacturer's discretion.
3. Frames:
 - a. Materials: Uncoated, steel sheet, minimum thickness of 0.053 inch.
 - b. Sidelite and Transom Frames: Fabricated from same thickness material as adjacent door frame.
 - c. Construction: Full profile welded.
4. Exposed Finish: Prime.

2.3 EXTERIOR HOLLOW-METAL DOORS AND FRAMES

- A. Construct exterior doors and frames to comply with the standards indicated for materials, fabrication, hardware locations, hardware reinforcement, tolerances, and clearances, and as specified.
- B. Extra-Heavy-Duty Doors and Frames: SDI A250.8, Level 3. At exterior locations, unless otherwise indicated.

1. Physical Performance: Level A according to SDI A250.4.
2. Doors:
 - a. Type: As indicated in the Door and Frame Schedule.
 - b. Thickness: 1-3/4 inches
 - c. Face: Metallic-coated steel sheet, minimum thickness of 0.053 inch (16 gauge), with minimum A40 coating.
 - d. Edge Construction: Model 2, Seamless.
 - e. Core: Polyisocyanurate.
 - 1) Thermal-Rated Doors: Provide doors fabricated with thermal-resistance value (R-value) complying with Section 5 of ASHRAE/IESNA Standard 90.1.
3. Frames:
 - a. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 coating.
 - b. Construction: Full profile welded.
4. Exposed Finish: Prime.

2.4 BORROWED LITES

- A. Hollow-metal frames of uncoated or metallic-coated steel sheet as appropriate for application, minimum thickness of 0.053 inch.
- B. Construction: Full profile welded.

2.5 FRAME ANCHORS

- A. Jamb Anchors:
 - 1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
 - 2. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
 - 3. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
 - 4. Postinstalled Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
- B. Floor Anchors: Formed from same material as frames, minimum thickness of 0.042 inch, and as follows:
 - 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 - 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.

2.6 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B.
- D. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

- F. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow-metal frames of type indicated.
- G. Grout: ASTM C 476, except with a maximum slump of 4 inches, as measured according to ASTM C 143/C 143M.
- H. Glazing: Comply with requirements in Section 088000 "Glazing."
- I. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.7 FABRICATION

- A. Fabricate hollow-metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for metal thickness. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Hollow-Metal Doors:
 - 1. Steel-Stiffened Door Cores: Provide minimum thickness 0.026 inch, steel vertical stiffeners of same material as face sheets extending full-door height, with vertical webs spaced not more than 6 inches apart. Spot weld to face sheets no more than 5 inches o.c. Fill spaces between stiffeners with glass- or mineral-fiber insulation.
 - 2. Vertical Edges for Single-Acting Doors: Provide beveled or square edges at manufacturer's discretion.
 - 3. Top Edge Closures: Close top edges of doors with inverted closures, except provide flush closures at exterior doors of same material as face sheets.
 - 4. Bottom Edge Closures: Close bottom edges of doors with end closures or channels of same material as face sheets.
 - 5. Exterior Doors: Provide weep-hole openings in bottoms of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
- C. Hollow-Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 - 1. Sidelite and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 - 2. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 - 3. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
 - 4. Floor Anchors: Weld anchors to bottoms of jambs with at least four spot welds per anchor; however, for slip-on drywall frames, provide anchor clips or countersunk holes at bottoms of jambs.
 - 5. Jamb Anchors: Provide number and spacing of anchors as follows:

- a. Masonry Type: Locate anchors not more than 16 inches from top and bottom of frame. Space anchors not more than 32 inches o.c., to match coursing, and as follows:
 - 1) Two anchors per jamb up to 60 inches high.
 - 2) Three anchors per jamb from 60 to 90 inches high.
 - 3) Four anchors per jamb from 90 to 120 inches high.
 - b. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - 1) Three anchors per jamb up to 60 inches high.
 - 2) Four anchors per jamb from 60 to 90 inches high.
 - 3) Five anchors per jamb from 90 to 96 inches high.
 - 4) Five anchors per jamb plus one additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - c. Compression Type: Not less than two anchors in each frame.
 - d. Postinstalled Expansion Type: Locate anchors not more than 6 inches from top and bottom of frame. Space anchors not more than 26 inches o.c.
6. Head Anchors: Two anchors per head for frames more than 42 inches wide and mounted in metal-stud partitions.
 7. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
 8. Terminated Stops: Terminate stops 6 inches above finish floor with a 45-degree angle cut, and close open end of stop with steel sheet closure. Cover opening in extension of frame with welded-steel filler plate, with welds ground smooth and flush with frame.
- D. Fabricate concealed stiffeners and edge channels from either cold- or hot-rolled steel sheet.
- E. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
1. Reinforce doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.
 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.
- F. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.

3. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
4. Provide loose stops and moldings on inside of hollow-metal work.
5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.8 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with SDI A250.10; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

2.9 ACCESSORIES

- A. Louvers: Provide louvers for interior doors, where indicated, which comply with SDI 111C, with blades or baffles formed of 0.020-inch-thick, cold-rolled steel sheet set into 0.032-inch-thick steel frame.
 1. Sightproof Louver: Stationary louvers constructed with inverted-V or inverted-Y blades.
- B. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- C. Grout Guards: Formed from same material as frames, not less than 0.016 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

- B. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow-metal work plumb, rigid, properly aligned, and securely fastened in place. Comply with Drawings and manufacturer's written instructions.
- B. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
 - 1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - b. Install frames with removable stops located on secure side of opening.
 - c. Install door silencers in frames before grouting.
 - d. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - e. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - f. Field apply bituminous coating to backs of frames that will be filled with grout containing antifreezing agents.
 - 2. Metal-Stud Partitions: Solidly pack mineral-fiber insulation inside frames.
 - 3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
 - 4. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- C. Hollow-Metal Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
 - 1. Non-Fire-Rated Steel Doors:
 - a. Between Door and Frame Jambs and Head: 1/8 inch plus or minus 1/32 inch.
 - b. Between Edges of Pairs of Doors: 1/8 inch to 1/4 inch plus or minus 1/32 inch.
 - c. At Bottom of Door: 5/8 inch plus or minus 1/32 inch.

d. Between Door Face and Stop: 1/16 inch to 1/8 inch plus or minus 1/32 inch.

- D. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.
1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 08 11 13

SECTION 08 33 23 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Exterior service doors.
- B. Related Sections:
 - 1. Section 055000 "Metal Fabrications" for miscellaneous steel supports.

1.3 PERFORMANCE REQUIREMENTS

- A. Structural Performance, Exterior Doors: Exterior overhead coiling doors shall withstand the wind loads, the effects of gravity loads, and loads and stresses within limits and under conditions indicated according to SEI/ASCE 7.
 - 1. Wind Loads: Uniform pressure (velocity pressure) of 45 lbf/sq. ft., acting inward and outward.
 - 2. Deflection Limits: Design overhead coiling doors to withstand design wind load without evidencing permanent deformation or disengagement of door components.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type and size of overhead coiling door and accessory. Include the following:
 - 1. Construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
- C. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below.

1. Curtain Slats: 12 inches long.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For overhead coiling doors to include in maintenance manuals.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.
- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

PART 2 - PRODUCTS

2.1 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:
 1. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural steel sheet; complying with ASTM A 653/A 653M, with G90 (Z275) zinc coating; nominal sheet thickness (coated) of 0.042 inch (18 gauge) and as required to meet requirements.
 2. Insulation: Fill slats for insulated doors with manufacturer's standard thermal insulation complying with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E 84 or UL 723. Enclose insulation completely within slat faces.
 3. Metal Interior Curtain-Slat Facing: Match metal of exterior curtain-slat face, with minimum steel thickness of 0.010 inch.
- B. Endlocks and Windlocks for Service Doors: Malleable-iron casings galvanized after fabrication, secured to curtain slats with galvanized rivets or high-strength nylon. Provide locks on not less than alternate curtain slats for curtain alignment and resistance against lateral movement.
- C. Bottom Bar for Service Doors: Consisting of two angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch thick; fabricated from manufacturer's standard hot-dip galvanized steel, stainless steel, or aluminum extrusions to match curtain slats and finish.
- D. Astragal: Equip each door bottom bar with a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene as a cushion bumper.

- E. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain, and a continuous bar for holding windlocks.

2.2 HOOD

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.

- 1. Galvanized Steel: Nominal 0.028-inch- thick, hot-dip galvanized steel sheet with G90 (Z275) zinc coating, complying with ASTM A 653/A 653M.

2.3 LOCKING DEVICES

- A. Locking Device Assembly: Fabricate with cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks.

- 1. Lock Cylinders: Cylinders standard with manufacturer and keyed to building keying system.
 - 2. Keys: Three for each cylinder.

2.4 CURTAIN ACCESSORIES

- A. Weatherseals: Equip each exterior door with weather-stripping gaskets fitted to entire perimeter of door for a weathertight installation, unless otherwise indicated.

- 1. At door head, use 1/8-inch- thick, replaceable, continuous sheet secured to inside of hood.
 - 2. At door jambs, use replaceable, adjustable, continuous, flexible, 1/8-inch- thick seals of flexible vinyl, rubber, or neoprene.

2.5 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

- B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, welded or seamless carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. of span under full load.

- C. Spring Balance: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.
- D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.
- E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.6 MANUAL DOOR OPERATORS

- A. General: Equip door with manual door operator by door manufacturer.
- B. Chain-Hoist Operator: Consisting of endless steel hand chain, chain-pocket wheel and guard, and gear-reduction unit with a maximum **[25-lbf]** **[30-lbf]** **<Insert value>** force for door operation. Provide alloy-steel hand chain with chain holder secured to operator guide.

2.7 EXTERIOR SERVICE DOOR ASSEMBLIES

- A. Service Door: Overhead coiling door formed with curtain of interlocking metal slats.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Cornell Iron Works, Inc.
 - b. McKeon Rolling Steel Door Company, Inc.
 - c. Overhead Door Corporation – Model 620 (Basis of Design).
- B. Operation Cycles: Not less than 20,000.
- C. Door Curtain Material: Galvanized steel.
- D. Door Curtain Slats: Flat profile slats of 2-5/8-inch center-to-center height.
 - 1. Insulated-Slat Interior Facing: Metal.
- E. Curtain Jamb Guides: Galvanized steel with exposed finish matching curtain slats. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise.
- F. Hood: Match curtain material and finish.
 - 1. Shape: Square.
 - 2. Mounting: As shown on Drawings.
- G. Manual Door Operator: Chain-hoist operator.
- H. Powder-Coated Finish: Custom color as selected by Architect.

2.8 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.9 STEEL AND GALVANIZED-STEEL FINISHES

- A. Powder-Coat Finish: Manufacturer's standard baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for cleaning, pretreatment, application, and minimum dry film thickness.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Install overhead coiling doors, hoods, and operators at the mounting locations indicated for each door.
- C. Accessibility: Install overhead coiling doors and controls along accessible routes in compliance with regulatory requirements for accessibility.

3.3 ADJUSTING

- A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.
- B. Lubricate bearings and sliding parts as recommended by manufacturer.

END OF SECTION 08 33 23

SECTION 08 71 00 - DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Work under this section includes furnishing and the installation of finish and security hardware specified herein and noted on drawings for a complete and operational system, including any electrified door hardware components including finish and security hardware and auto operators for entrance doors.

Items include, but are not limited to:

1. Hinges/Continuous Pivots
2. Flush Bolts
3. Exit Devices
4. Locksets and Cylinders
5. Push Plates - Pulls
6. Coordinators
7. Closers/ADA Operators
8. Kick, Mop and Protection Plates
9. Stops, Wall Bumpers, Overhead Controls
10. Thresholds, Gasketing and Door Bottoms
11. Silencers
12. Miscellaneous Trim and Accessories
13. Electrified Hardware Items, Controls and Power Supplies
14. Electronic Managed Locksets

B. RELATED SECTIONS:

1. Division 06 – Carpentry
2. Section 081113 – Metal Doors and Frames
3. Section 081416 – Wood Doors
4. Section 084113 – Entrances and Storefronts
5. Division 26 – Electrical
6. Division 27 – Communications
7. Division 28 – Electronic Safety and Security

C. Alternates

1. Refer to Division 01 in the project manual for project alternates.

1.02 REFERENCES

- A. The following references are used in this section.

1. NFPA 80 – Standard for Fire Doors, 2007.
2. Installation Guide for Doors and Hardware, DHI, 1984.
3. ANSI / BHMA A156.18, Materials and Finishes, 2006.

1.03 GENERAL REQUIREMENTS

- A. Provide items, articles, materials, operations and methods listed, mentioned or scheduled herein or on drawings, in quantities as required to complete project. Provide hardware that functions properly. Prior to furnishing hardware, advise Architect of items that will not operate properly, are improper for conditions, or will not remain permanently anchored.

B. DESCRIPTION OF WORK

1.04 SUBMITTALS

- A. Hardware Schedule: Submit 5 copies of hardware schedule in vertical format as illustrated by the Sequence of Format for the Hardware Schedule as published by the Door and Hardware Institute. Schedules which do not comply will be returned for correction before checking.
- B. Hardware schedule shall clearly indicate architect's hardware group and manufacturer of each item proposed.
- C. The schedule shall be reviewed prior to submission by a certified Architectural Hardware Consultant (AHC), who shall affix his or her seal attesting to the completeness and correctness of the schedule.
 - 1. Provide 2 copies of illustrations from manufacturer's catalogs and data in brochure form.
 - 2. Check specified hardware for suitability and adaptability to details and surrounding conditions. Indicate unsuitable or incompatible items and proposed substitutions in hardware schedule.
 - 3. Provide listing of manufacturer's template numbers for each item of hardware in hardware schedule.
 - 4. Furnish other Contractors and Subcontractors concerned with copies of final approved hardware schedule. Submit necessary templates and schedules as soon as possible to hollow metal, wood door, and aluminum door fabricators in accordance with schedule they require for fabrication.
 - 5. Samples: Lever design or finish sample: Provide 3 samples if requested by architect.
- D. Wiring Diagrams: Provide complete and detailed system operation and elevation diagrams specially developed for each opening requiring electrified hardware, except openings where only magnetic hold-opens or door position switches are specified. Provide these diagrams with hardware schedule submittal for approval. Provide detailed wiring diagrams with hardware delivery to jobsite.
- E. Installation Instructions: Provide manufacturer's written installation and adjustment instructions for finish hardware. Send installation instructions to site with hardware.
- F. Templates: Submit templates and "reviewed Hardware Schedule" to door and frame supplier and others as applicable to enable proper and accurate sizing and locations of cutouts and reinforcing.
- G. Contract Closeout Submittals: Comply with Section 01700 including specific requirements indicated below.
 - 1. Operating and maintenance manuals: Submit 3 sets containing the following:
 - 2. Complete information in care, maintenance, and adjustment, and data on repair and replacement parts, and information on preservation of finishes.
 - 3. Catalog pages for each product.
 - 4. Name, address, and phone number of local representative for each manufacturer.
 - 5. Parts list for each product.
 - 6. Copy of final approved hardware schedule, edited to reflect "As installed".
 - 7. Copy of final keying schedule.
 - 8. As installed "Wiring Diagrams" for each opening connected to power, both low voltage and 110 volts.
 - 9. One complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

1.05 QUALITY ASSURANCE

- A. General Contractor's Investigation: Prior to Contract Execution, the General Contractor shall have thoroughly investigated the entities that will be performing work or supplying materials, products, equipment, or systems for this project, to ensure that they comply with all of the qualifications and requirements mentioned or implied in the Contract Documents. If it is later determined that any of the previously mentioned entities do not comply with the qualifications and requirements specified in the Contract Documents, the General Contractor will be required to replace that entity with a qualified entity at no increase in Contract Sum or Contract Time.
- B. Manufacturer: Obtain each type of hardware (ie. latch and locksets, hinges, closers) from single manufacturer, although several may be indicated as offering products complying with requirements.
- C. Qualifications of the Hardware Supplier: A recognized architectural door hardware supplier, with warehousing facilities, who has been furnishing hardware and installation in the Project's vicinity for a period of not less than 4 years. The supplier shall be, or shall employ, an Architectural Hardware Consultant (AHC) who is available, at reasonable times during the course of the work, for consultation about the Project's hardware requirements, to the Owner, Architect, and Contractor. An Architectural Hardware Consultant (AHC) shall prepare all hardware and access control schedules. This Supplier shall be responsible for proper coordination of all finish hardware items and access control items with related sections to insure compatibility of products.
 - 1. Hardware supplier must be an authorized, direct factory distributor of all door hardware products specified herein to insure compliance and service of these products.
 - 2. Require supplier to meet with Owner to finalize keying requirements and to obtain final instructions in writing.
- D. Qualifications of Installer: The hardware installer shall have documented experience in the installation of hardware of similar quantities and types as required for this project. The installer's qualifications shall be submitted to the architect, in writing, for approval by the architect before any work shall commence.
- E. Fire-Rated Openings: Furnish door hardware for fire-rated openings that complies with NFPA Standard No. 80 and requirements of the Authorities Having Jurisdiction. Furnish only items, of door hardware, that are listed and are identical to products tested by UL, ITS-WH, FM, or other testing and inspecting organization acceptable to the Authorities Having Jurisdiction, for use on types and sizes of doors indicated, in compliance with the requirements of fire-rated door and door frame labels.

Project requires door assemblies and components that are compliant with positive pressure and S Label requirements. Specifications must be cross-referenced and coordinated with door and frame manufacturers to ensure that total door opening engineering is compatible with UL10C Standard for Positive Pressure Fire Tests of Door Assemblies.

Where emergency exit devices are required on fire-rated doors (with supplementary marking on doors' UL or FM labels including "Fire Door to be Equipped with Fire Exit Hardware") provide UL/WHI or FM label on exit devices indicating "Fire Exit Hardware".

- F. Substitutions: All substitution requests are required to be submitted prior to the bid date and complying with the procedures and time frame as outlined in Division 01, General Requirements. Approval of submitted products is at the discretion of the architect and his hardware consultant.
- G. At the Project's Completion, the Owner's Representative shall accompany the Architect and General Contractor during the Door Hardware and Access Control Items punch list phase of the project close-out, insuring the Owner's Representative is familiar with all applications and systems, as installed. Refer to additional requirements under 3.0 EXECUTION.

- H. Pre-Installation Meeting: Prior to door hardware installation, the General Contractor / Construction Manager shall request a hardware installation meeting to be held at the project location. This meeting shall convene prior to the hardware's installation. The types of hardware this meeting shall include are: locksets, exit devices, and door closers. The manufacturer's representatives of the above listed products, in conjunction with the hardware supplier for this project, shall conduct the installation training. All hardware installers shall be required to attend this meeting to receive certificate of authorized training. This meeting shall serve as door openings coordination and review of all shop drawings from related trades prior to the hardware installation. The Hardware Supplier shall include any related meeting costs in their proposal.
- I. Electrified Hardware and Security Hardware Systems: Prior to ordering the electrified hardware, the General Contractor shall request a coordination meeting. This meeting shall convene prior to or after the Door Hardware Schedule and the wiring diagrams have been submitted to the General Contractor. All related trades shall be represented at this meeting, which shall also include the architect, the Owner's representative, the hardware supplier, and the hardware manufacturer's representative as requested. This meeting shall serve as a review and coordination of all electrified hardware, wiring, connections, location for power supplies, and remote switches, and door functions. All related trades shall make any required changes, and resubmit schedules, diagrams, and any other required data, no later than one (1) week following this meeting.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Packaging of door hardware is the responsibility of the supplier. As material is received by the hardware supplier from various manufacturers, sort and repackage in containers clearly marked with appropriate hardware set numbers to match the set numbers of the approved hardware schedule. Two or more identical sets may be packed in the same container.
- C. The door hardware supplier shall deliver all individually packaged hardware items in a timely fashion to the place of installation (Shop or Project Site); direct factory shipments are not acceptable unless agreed upon beforehand. Hardware supplier shall coordinate delivery times and schedules with the contractor.
- D. The General Contractor, door hardware supplier, access control supplier, and installers shall count, coordinate, and store all door hardware and access control items herein, verifying complete counts of all items scheduled and furnished. The contractor must report all shortages (discrepancies with shipping documents) within five (5) working days. The manufacturers' and Owner's representatives will inspect the installation of the door hardware and access control items during that phase of construction. Any deficiencies in installation of all materials included herein shall be corrected before installation continues.
- E. The General Contractor shall provide a secure lock-up for the door hardware and security equipment delivered to the Project, but not yet installed. Control handling and installation of the hardware items that are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.

1.07 WARRANTY

- A. All materials must be warranted against defects in workmanship and materials for a period of one (1) year from date of acceptance of this project, unless otherwise noted. Any evidence of misuse or abuse voids all warranties. These warranties shall be each manufacturers' standard written warranty.

B. Special Warranties:

1. Continuous Geared Hinges: Life of the Door Opening.
2. Mortise Latchsets and Locksets: Three (3) Year Period.
3. Exit Devices: Three (3) Year Period.
4. Door Closers: Thirty (30) Year Period.
5. Electromagnetic Door Holders: Two (2) Year Period.
6. Saddle Thresholds, Bumper Thresholds, Door Sweeps, Self-Adhesive Gasketing, Perimeter Seals, Astragal Seals, Self-Adhesive Astragal Gasketing, Mullion Seals, Interlocking Seals, and Drip Strips: Five (5) Year Period.

C. Any manufacturer whose standard written warranty does not equal or exceed the requirements listed above must provide a letter stating that they will extend their warranty to comply with the requirements of this specification.

D. All of the manufacturer’s fasteners and attachments supplied with each hardware item must be installed to maintain the manufacturer’s fire listing and/or warranty.

E. Refer to Section 01 - Closeout Procedures for additional warranty requirements.

1.08 MAINTENANCE

A. Maintenance Tools and Instructions: General Contractor shall furnish a complete set of specialized tools and maintenance instructions as needed for the Owner’s continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 PRODUCTS

2.1 BUTTS AND HINGES

A. Acceptable Manufacturers:

Ives	Bommer	Stanley
5BB1	BB5000	FBB179
5BB1	BB5001	FBB191
5BB1HW	BB5004	FBB168
5BB1HW	BB5005	FBB199

B. Application:

1. Provide NRP (non-removable pins) at out-swinging lockable doors.

C. Quantity:

1. Two hinges per leaf for openings through 60 inches high.
2. One additional hinge per leaf for each additional 30 inches in height or fraction thereof.
3. Four hinges for Dutch doors up to 90 inches in height.

2.2 ELECTRIC HINGES

A. Acceptable manufacturers:

Ives	Bommer	Stanley
5BB1 x TW8	BB5060	CEFBB179
5BB1HW x TW8	BB5064	CEFBB168

- B. Provide sufficient number of concealed wires to accommodate electric function of specified hardware.
- C. Locate electric hinges at second hinge from bottom. Where electric hinges are used in conjunction with exit devices, locate hinge nearest to exit device.
- D. Provide mortar guard for each electric hinge specified. Electric hinges shall have a mortar box fastened to the frame prior to installing the frame in the wall.

2.3 ELECTRIC POWER TRANSFER

- A. Acceptable manufacturers:

Von Duprin	Security Door Controls	Securitron
EPT-10	PTM-10	CEPT

- B. Provide power transfer sufficient for number and gage of wires to accommodate electric function of specified hardware.
- C. Electric power transfer is to be located per manufacturer’s template and UL requirements, unless interference with operation of door or other hardware items.

2.4 PIVOT SETS

- A. Acceptable Manufacturer and Series:

Type	Ives	Rixson
Offset, hvy. duty	7226	147
Intermediate	7226 INT	M19

- B. Provide pivot sets as specified in Hardware Groups.

2.5 FLUSH BOLTS AND DUSTPROOF STRIKES

- A. Acceptable manufacturers:

Ives	Trimco	Burns
FB31P	3810	7842
FB458	3915	590
DP2	3910	545

- B. Provide automatic and manual flush bolts with forged bronze face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch steel or brass rods at doors up to 90 inches in height. Top rods at manual flush bolts for doors over 90 inches in height shall be increased by 6 inches for each additional 6 inches of door height. Provide dust-proof strikes at each bottom flush bolt.

2.6 LOCKSETS – MORTISE

- A. Acceptable Manufacturer and Series:

Schlage	Corbin	Best
L9000 x 06N (Owner Preferred)	ML2000 x Newport X LWM	45H x 14j

- B. Provide lock functions specified in Hardware Groups, with following provisions:
 1. Cylinders: Refer to “KEYING” article, herein.

2. Locksets shall be manufactured from heavy gauge steel, 1/8" minimum lock case thickness, containing components of steel with a Zinc dichromate plating for corrosion resistance.
3. Locksets are to have a standard 2 3/4" backset with a full 3/4" throw. Deadbolt shall be a full 1" throw, constructed of stainless steel.
4. Lock shall be easily handed without opening the lock case.
5. Lock trim shall be through-bolted to door to assure correct alignment a proper operation.
6. Furnish "Knurled" or "Tactile" outside levers as indicated in the door Hardware Sets. "Abrasive" outside levers shall not be acceptable.

2.7 EXIT DEVICES

A. Acceptable Manufacturers:

Von Duprin	Detex	Precision
98/99 Series (Owner Preferred)	Advantex Series	Apex Series

- B. Provide exit device series and functions as specified in Hardware Groups. Von Duprin product numbers are referenced in the Hardware Groups.
- C. All exit devices shall be UL listed for panic. Exit devices for labeled doors shall be UL listed as "Fire Exit Hardware".
- D. Where lever trim is specified, provide lever design to match lockset levers.
- E. Provide lever trim with breakaway feature.
- F. Provide cylinders for exit devices with locking trim and cylinder dogging.
- G. Provide exit devices with stainless steel touch bars. Load bearing plastic parts are not acceptable.
- H. Provide exit devices with cast metal, flush end caps.
- I. Provide deadlocking latchbolt feature for exit devices.
- J. Provide roller strikes on all rim exit devices.
- K. Provide cylinder dogging feature for non-rated exit devices.
- L. Provide keyed removable mullions, with cylinders, as specified in the Hardware Groups.

2.8 KEYING

- A. Master key or Grand master key cylinders and key in groups, unless otherwise specified. Factory masterkey with manufacturer retaining permanent keying records.
- B. Provide 6 masterkeys for each masterkey set. Provide 3 change keys for each lock. Provide 2 control keys for core removal. Stamp keys "DO NOT DUPLICATE."
- C. Submit proposed keying schedule to Architect. If requested, meet with Owner and Architect to review schedule.
- D. Provide full size conventional core cylinders, with patented key control for each lock.

2.9 DOOR TRIM

A. Acceptable Manufacturers and Types:

Ives	Trimco	Burns
8200	1001-9	56
8303	1018-3B	5426C

9100	1741	422
8190	1191-3	29C

- B. Push Plates:
 - 1. Ives type 8200 6 inches by 16 inch unless otherwise indicated.
 - 2. Where width of door stile prevents use of 6 inch wide plate, provide push plate one inch less than width of stile but not less than 4 inches wide.
- C. Pull Plates:
 - 1. Ives type 8303 4 inches by 16 inches unless otherwise indicated.
- D. Push Bars:
 - 1. Ives type 9100, unless otherwise indicated.
- E. Pulls:
 - 1. Ives Series 8190, unless otherwise indicated.
 - 2. Where required, mount back to back with push bars.
- F. Kick Plates and Armor Plates: Ives 8400 Series, minimum of 0.050 inch thick, beveled 4 edges.
 - 1. At single doors provide width two inches less than door width on stop side and one inch less than door width on pull side.
 - 2. At pairs of doors provide width one inch less than door width on both sides.
 - 3. Height of 10 inches, unless otherwise indicated.
 - 4. Provide plates with countersunk screw holes.

2.10 COORDINATORS

- A. Acceptable Manufacturers:

Ives	Trimco	Burns
COR Series	3094 Series	7600 Series

- B. Provide Ives COR Series coordinator for labeled pairs of doors equipped with automatic flush bolts and those with vertical rod/mortise lock fire exit device combinations with astragals.
- C. Provide filler bars for total opening width, closer mounting brackets, carry bars, and special preparation for top latches where applicable.

2.11 DOOR CLOSERS

- A. Acceptable Manufacturers and Types of Exposed Closers:

LCN	Sargent	Corbin
4011 / 4111 (Owner Preferred)	281 / 281-P10	DC8200 / DC8210 x A3

- B. Closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder.
- C. Provide non-sized closers, continuously adjustable over the full range of closer sizes, and allow for reduced opening force to meet opening force requirements of ANSI A117.1
- D. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, swing speed, and back check.

- E. Provide closers with solid forged steel main arms (and forearms for parallel arm closers) and where specified to have a cast-in solid stop on the closer shoe ("CUSH"). Parallel arm mounted closers shall have "EDA" type arms or, where specified, "CUSH" or "SCUSH" type arms.
- F. Surface closers shall be certified to exceed ten million full load cycles by a recognized independent testing laboratory.
- G. Provide drop plates, brackets, or adapters for arms as required to suit details.
- H. Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- I. Provide back-check for closers.
- J. Provide hold-open arms where indicated.
- K. Provide closers for doors as noted in Hardware Groups and, in addition, provide closers for labeled doors whether or not specifically noted in group.
- L. Provide closers meeting the requirements of UBC 7-2, 1997 and UL 10C positive pressure tests.
- M. Pressure relief valves (PRV's) shall not be permitted.

2.12 WALL STOPS AND HOLDERS

- A. Acceptable Manufacturers and Types:

Ives	Trimco	Door Controls
WS406/407CCV	1270WVP	3211T

- B. Provide WS406/407CCV Series wall stop for each door leaf unless otherwise specified, or where conditions require the use of an overhead stop.
- C. Floor or base stops shall be used only where definitely specified or absolutely unavoidable.

2.13 THRESHOLDS

- A. Acceptable Manufacturers and Product:

National Guard	Reese	Zero
425E	S425A	8655A

- B. Where thresholds are specified in hardware groups, provide 8655E thresholds unless detailed otherwise.
- C. Refer to drawings for special details. Provide accessories, shims and fasteners.
- D. Where thresholds occur at openings with one or more mullions, they shall be cut for the mullions and extended continuously for the entire opening.

2.14 WEATHERSTRIPPING

- A. Acceptable Manufacturers and Product:

	National Guard	Reese	Zero
Sweeps	201NA	323C	39A
Jams	700SA	755C	429A
Rain Drips	16A	R201C	142A

- B. Where weatherstripping is specified in hardware groups, provide 429A unless detailed otherwise.
- C. Provide self-tapping fasteners for weatherstripping being applied to hollow metal frames.
- D. Where sweeps are specified in hardware groups, provide 39A unless detailed otherwise.
- E. Where rain drips are specified in hardware groups, provide 142A x full frame width, unless detailed otherwise.

2.15 GASKETING

- A. Acceptable Manufacturers:

National Guard	Reese	Zero
5050	F-797B	188S

- B. Where smoke gasket is specified in hardware groups, provide 188S, unless detailed otherwise.
- C. Provide gaskets for 20-minute doors and doors designated for smoke and draft control.
- D. Where frame applied intumescent seals are required by the manufacturer, provide gaskets that comply with UBC 7-2, 1997 and UL 10C positive pressure tests.

2.16 ACCESS CONTROL READER

- A. Acceptable Manufacturer and Types:

Schlage
AptiQ MT11/MT15

- B. Requirements: Read Only Multi-technology Contactless reader
 - 1. Access control card readers shall be as manufactured by a global company who is a recognized leader in the production of access control devices. Card reader manufactured for non-access control applications shall not be acceptable
 - 2. Multi-technology contactless reader shall read access control data from both 125 kHz and 13.56 MHz contactless smart cards and NFC-compatible. The multi-technology contactless reader shall be optimally designed for use in access control applications that require reading both 125 kHz Proximity and 13.56 MHz contactless smart cards

2.17 DOOR POSITION SWITCHES

- A. Acceptable Manufacturers and Types:

Schlage	Sentrol
679-05HM	1078W
679-05WD	1078W

- B. Coordinate door and frame preparations with door and frame suppliers.
- C. Switches shall be installed in frame head approximately 4" from latching door edge.

2.18 POWER SUPPLIES

- A. Acceptable Manufacturers and Types:

Schlage Electronics	Precision	Securitron
---------------------	-----------	------------

PS900 Series	ELR Series	BPS Series
--------------	------------	------------

B. Requirements:

1. Provide power supplies, recommended and approved by the manufacturer of the electrified locking component, for the operation of electrified locks, electrified exit devices, magnetic locks, electric strikes, and other components requiring a power supply.
2. Provide the appropriate quantity of power supplies necessary for the proper operation of the electrified locking component and/or components as recommended by the manufacturer of the electrified locking components with consideration for each electrified component utilizing the power supply, the location of the power supply, and the approved wiring diagrams. Locate the power supplies as directed by the Architect.
3. Provide a power supply that is regulated and filtered 24 VDC, or as required, and UL class 2 listed.

C. Options: Provide the following options.

1. Provide a power supply, where specified, with the internal capability of charging optional sealed backup batteries 24 VDC, or as required, in addition to operating the DC load.
2. Provide sealed batteries for battery back-up at each power supply where specified.
3. Provide keyed power supply cabinet.
4. Provide a power supply complete requiring only 120VAC to the fused input and shall be supplied in an enclosure.
5. Provide a power supply with emergency release terminals, where required, that allow the release of all devices upon activation of the fire alarm system complete with fire alarm input for initiating "no delay" exiting mode.

2.19 SILENCERS

A. Acceptable Manufacturers and types:

Ives	Steelcraft	Don-Jo
SR64	Q146	1608

- B. Provide grey rubber silencers featuring pneumatic design that, once installed, forms an air pocket to absorb shock and reduce noise of door closing.
- C. Provide three (3) silencers per hollow metal strike jamb; two (2) per hollow metal double door head. Omit at doors scheduled to receive perimeter weatherstripping or smoke gasket.
- D. Silencers shall meet ANSI/BHMA A156.16, L03011

2.20 KEY CABINET

- A. Provide key cabinets by Lund Equipment, Telkee Incorporated, or Key Control.
- B. Lund Deluxe wall type cabinet, Series 1200.
- C. Provide cabinet with one hook for each lock or cylinder plus at least 50 percent extra hooks.
- D. Provide each hook with one non-removable security key tag and one snap-on link duplicate key tag.
- E. Provide tools, instruction sheets and accessories required to complete installation.
- F. Owner will place keys in key cabinet and complete index cards furnished with key system.

2.21 KEY MANAGEMENT SOFTWARE

- A. Provide Sitemaster 200® key management software.

- B. Software shall provide tracking, issuing, collecting and transferring information regarding keys, doors, and hardware.
- C. Provide training for Owner's personnel on the proper operation and application of the key management software.

2.22 FASTENERS

- A. Including, but not limited to, wood or machine screws, bolts, bolts, nuts, anchors, etc. of proper type, material, and finish required for installation of hardware.
- B. Use phillips head for exposed screws. Do not use aluminum screws to attach hardware.
- C. Provide self-tapping (TEC) screws for attachment of sweeps and stop-applied weatherstripping only.

2.23 TYPICAL FINISHES AND MATERIALS

- A. Finishes, unless otherwise specified:
 - 1. Butts: Outswinging Exterior Doors
 - a. US32D (BHMA 630) on Stainless Steel
 - 2. Butts: Interior Doors and Inswinging Exterior Doors
 - a. US26D (BHMA 652) on Steel
 - 3. Flush Bolts:
 - a. US26D (BHMA 626) on Brass or Bronze
 - 4. Exit Devices:
 - a. US26D (BHMA 626) on Brass or Bronze
 - 5. Locks and Latches:
 - a. US26D (BHMA 626) on Brass or Bronze
 - 6. Push Plates, Pulls and Push Bars:
 - a. US32D (BHMA 630) on Stainless Steel
 - 7. Coordinators:
 - a. USP (BHMA 600) on Steel
 - 8. Kick Plates, Armor Plates, and Edge Guards:
 - a. US32D (BHMA 630) on Stainless Steel
 - 9. Overhead Stops and Holders:
 - a. US26D (BHMA 626) on Brass or Bronze
 - 10. Closers: Surface mounted.
 - a. Sprayed Aluminum Lacquer.
 - 11. Miscellaneous Hardware:
 - a. US26D (BHMA 626) on Brass or Bronze

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine doors, frames, and related items for conditions that would prevent the proper application of finish hardware. Do not proceed until defects are corrected.

3.2 INSTALLATION

- A. Mount hardware units at heights indicated in the following applicable publications, except as specifically indicated or required to comply with governing regulations and, except as otherwise indicated, by the Architect.
 - 1. "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.

- B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Where cutting and fitting is required to install hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation or application of surface protection with finishing work specified in the Division 09 Sections. Do not install surface-mounted items until finishes have been completed on the substrates involved.
- C. Sets units level, plumb, and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- D. Where scheduled, door pulls shall be through-bolted with bolt heads concealed behind push plates.
- E. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.
- F. Set thresholds, for exterior and interior doors, in a full bed of butyl-rubber or polyisobutylene mastic sealant complying with requirements specified in Division 07 - Joint Sealers.
- G. Weatherstripping and Seals: Comply with manufacturer's instructions and recommendations to the extent installation requirements are not otherwise indicated.
- H. The hardware installer shall be responsible for installation of all mechanical and electromechanical hardware items contained within this specification, in accordance with the manufacturer's technical installation guidance, and in addition to all applicable code requirements.
- I. The Electrical Sub-Contractor, under Division 26 - Electrical, shall be responsible for providing and installing all (120 VAC) power source wiring as required for the electrified locking and access control hardware, equipment, accessories, and power supplies. This includes quad outlets as required on a dedicated circuit in designated IT / Telecommunication Room(s) and the related conduit, stud-ins, junction boxes, and connectors required for the power source delivery and connections. Provide cabling, conduit, stud-ins, patch cords, fire stop systems, data connectors, junction boxes, and back boxes for both the electrified locking hardware and access control equipment at each of the access controlled or monitored openings per plan drawings and specifications. Provide and install conduit between each of the aforementioned devices and between junction boxes, power supplies, and access control equipment located on or above each door opening.
 - 1. At wall mounted remote card readers, provide conduit on the secured side of each door opening, at 48" from above the finished floor and 6" from the edge of each door frame, to the related power supplies and access control equipment; unless otherwise instructed by Architect.
 - 2. At all electrical hardware power transfer items provide conduit on the secured side of each door opening, from the power transfer items, through-wire hinges, or serviceable panel locations, inside of frame's jambs, to the related power supplies and access control equipment.
 - 3. Installation of power supplies and interfacing of security system with fire alarm system as required, and coordination of complete security system shall be provided by the Electrical Sub-Contractor, under the Division 26 - Electrical. Electrical Sub-Contractor shall be responsible for providing and installing all 120 VAC cabling connections and terminations from the electrical junction boxes to these electrical devices.

- J. The Access Control System's supplier shall be responsible for providing all low-voltage (12 / 24 VDC) wiring and communication cabling (RS-232 / RS-485) installation from network control processors to reader controllers, I / O monitor / control interface panels, electrified and integrated locking hardware, remote card readers, keypads, or display terminals, monitoring and signaling switches, and power supplies, identification, and termination in accordance with the manufacturer's technical installation guidance, in addition to all applicable code requirements. Installation of all card readers, controllers, software packages, door position switches, and run low voltage wiring from the power supplies / controllers to the electrified hardware items at each opening where specified. The Access Control System's installer shall also be responsible for connectors, final wire terminations, final hook-ups, testing, system set-up, warranty, and Owner Turnover. Owner Training shall be provided under this Section.
- K. Upon completion of the final installation of the Door Hardware and Access Control System, and burn in of the Security System, the Contract Hardware Distributor and the Access Control System's Supplier shall jointly make final adjustments to the electrified hardware and Access Control System's openings to insure proper adjustment and function of the opening is in compliance with the system's functionality requirements.

3.3 FIELD QUALITY CONTROL

- A. After installation has been completed, provide services of qualified hardware consultant to check Project to determine proper application of finish hardware according to schedule. Also check operation and adjustment of hardware items.
- B. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

3.4 ADJUSTING AND CLEANING

- A. At final completion, hardware shall be left clean and free from disfigurement. Make final adjustment to door closers and other items of hardware. Where hardware is found defective repair or replace or otherwise correct as directed.
- B. Adjust door closers to meet opening force requirements of Uniform Federal Accessibility Standards.
- C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of space or area, return to work during week prior to acceptance or occupancy, and make final check and adjustment of hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors.
- D. Instruct Owner's personnel in proper adjustment and maintenance of door hardware and hardware finishes.
- E. Clean adjacent surfaces soiled by hardware installation.

3.5 PROTECTION

- A. Provide for proper protection of items of hardware until Owner accepts Project as complete.

3.6 HARDWARE GROUPS

- A. The following schedule of hardware groups shall be considered a guide only, and the supplier is cautioned to refer to general conditions, special conditions, and the preamble to this section. It shall be the hardware supplier's responsibility to furnish all required hardware.
- B. Refer to the door schedule for hardware group required at each door opening.

END OF SECTION

SECTION 09 05 17 – SEALING CONCRETE SLABS AND FLOORS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes surface preparation and materials to seal new and existing concrete slabs and floors. This section of the specifications is not applicable for bonded finishes such as VCT, carpet, sheet vinyl, toppings, paints, etc.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
 - 2. Division 03 Section "Cast-In-Place Concrete" for requirements of concrete to be polished.
 - 3. Division 03 Section "Polished Concrete" for coordination.
 - 4. Division 03 Section "Concrete Staining" for coordination.
 - 5. Division 03 Section "Sealing Concrete Floors and Slabs for coordination"

1.2 QUALITY ASSURANCE

- A. Applicators Qualifications:
 - 1. Sealer applicator shall be acceptable to and approved by the sealer manufacturer and shall be qualified by the manufacturer to provide the specified warranty. Installers that do not meet the manufacturer's Warranty requirements are not acceptable.
 - 2. Installer shall have at least 5 years' installing similar products and shall have completed at least 5 projects of similar size and scope within the last year.
- B. Submittals: Submit the following floor preparation criteria from each sealing manufacturer.
 - 1. Floor level and flatness
 - 2. Concrete curing time
 - 3. Concrete curing method
 - 4. Concrete compressive and tensile strength
 - 5. Concrete surface profile and surface finish requirements
 - 6. Moisture content and recommended tests
 - 7. Alkalinity (pH) and recommended test
 - 8. Ambient temperature and duration prior to installation
 - 9. Ambient temperature at time of installation.
 - 10. Ambient temperature and duration after installation
 - 11. Size and location of acceptable cracks.
 - 12. Recommended methods of repairing cracks.
 - 13. Acceptable adhesion values for each floor finish.
 - 14. Vapor barrier and waterproofing requirements under the floor slab.
 - 15. Where floor finish manufacturer's floor preparation requirements are less severe than those specified in PART 3 of this specification, denote all differences separately.
- C. Mockup: Prepare a section of concrete surface, in location and of size directed by the Architect, to demonstrate and show expected preparation and completed sealed concrete.
 - 1. Notify Architect and materials manufacturer one week in advance of the dates and times when mockups will be prepared.
 - 2. Locate mockups as directed by Architect.
 - 3. Protect accepted mockups

4. Retain and maintain mockups in an undisturbed condition as a standard for judging the surface preparation until all preparation has been completed and accepted. When directed by the Architect, approved mockups may become a part of the completed work.
5. Acceptance of mockups does not constitute approval of deviations from the Contract Documents contained in mockups, unless such deviations are specifically approved by Architect in writing. All installed work under this Section of the specifications will be compared with the approved construction mockup and will be judged and evaluated accordingly.
6. Mockup shall show examples of sealed crack repairing and patching.

1.4 PROJECT CONDITIONS

- A. Maintain a minimum temperature of 75 deg. F. or as recommended by the floor finish manufacturer for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation unless recommended otherwise. After this period, maintain a temperature of not less than 55 deg F unless recommended by the floor finish manufacturer.
- B. Close spaces to traffic during and after preparation and during and after installation. Coordinate with the applicable floor finish installers.
- C. Provide suitable and acceptable storage facilities for the floor finish materials as required by the installer. Coordinate requirements (storage time, ambient conditions, convenience, and accessibility) for storing floor finish materials with the applicable installers.
- D. Coordinate with the referenced sections for staining concrete and concrete polishing to ensure that sequencing of the polishing, staining, and sealing are performed in the proper order and sequence to provide the optimum results.

PART 2 - PRODUCTS

2.1 SEALING PRODUCTS

- A. Sealer: Where the finish schedule shows the floor to be sealed concrete, provide a colorless, clear, transparent sealer. Product: Ashford Formula by Curecrete Chemical Company, Inc. or a reviewed substitute with performance properties that are advertised and proven to be equal to the specified product. Surface sealers or membranes are not acceptable.
 1. Sealer Properties
 - a. Warranty: Manufacturer's advertised 5-year labor and 20-year materials warranty for the listed properties
 - b. One time application. Does not require periodic re-application to maintain performance properties for at least the warranty period
 - c. Seals concrete
 - d. Dustproofs concrete
 - e. Densify/harden concrete
 - f. Waterproofs concrete
 - g. Maintains sheen
 - h. Resistance to grease and oil
 - i. Can be successfully painted at a later date without removal of sealer.

- Patching and Repair Materials: High strength patching materials for repairing cracks, spalls, voids, depressions, etc. Materials shall be compatible with and will not interfere with the performance of the sealer and be recommended by the sealer manufacturer. All materials shall blend in with the concrete without contrast and be aesthetically acceptable to the Architect. Do not use gypsum based patching materials.
- B. Accessories: Provide all required and necessary cleaners, sealers, etc, to prepare the concrete floor to be sealed.

PART 3 - EXECUTION

3.1 INSPECTION AND TESTING

- A. These specifications cover testing, inspection, and surface preparation of the concrete prior to applying the sealer. Where the sealer manufacture does not require or recommend a specified inspection, test, or surface preparation procedure, that procedure will not be required by the Contract Documents. However, the sealer installer shall be responsible for any failures caused by inadequate inspection, testing, or surface preparation regardless of whether or not the procedure or procedures were not recommended by the sealer manufacturer.
- B. Where test and inspection results (including, but not limited to, calcium chloride, relative humidity, sounding, and tests for level and flatness) indicate that moisture and surface conditions do not meet the concrete sealer manufacturer's requirements, the Contractor shall provide all labor, materials, and procedures to ensure that the substrate meets the manufacturer's requirements prior to applying the sealer. Neither the Contract Sum or Contract Time will not be modified to meet this provision.
- C. Record results of all tests and send copies to the Owner and Architect. Show on a floor grid where each test was conducted and the test results. As a minimum, each report shall include the following information for each test that was conducted:
1. Project name
 2. Date and Time of the Test
 3. Test Location (wall, room, etc) of test.
 4. Name of person conducting test
 5. Test results
 6. Conclusions and recommendations
- D. Examine subfloors and conditions, with installer and manufacturer present, for compliance with requirements with sealer manufacturer's requirements for maximum moisture content, alkalinity range, installation tolerances, structural conditions, and other conditions affecting performance of floor covering. Notify the Architect of conditions detrimental to the proper and timely completion of the work. Verify that there is no curing membrane on the floor. If there is a curing membrane or other sealer on surfaces to be sealed, remove the membrane according the manufacturer's instructions. Acid-removal is not an acceptable method to remove curing membrane or sealer.
1. Substrate are free of cracks, ridges, depressions, scale, and foreign deposits of any kind.
 2. Prior to installing floor system, fill moving joints and non-moving kerfs as recommended by the floor system manufacturer.
 3. Ensure that concrete does not contain aggregates that are soft or break down in liquids.
- E. Ensure that finished concrete complies with requirements specified in ASTM F710. Notify the Contractor and Architect, in writing, of all unacceptable conditions.

- F. Ensure variations in concrete slab levels do not exceed 1/8" in 10'. High spots shall be ground down and minor low spots shall be filled with epoxy or epoxy/sand mixture or a cementitious underlayment as recommended by the floor system manufacturer.
- G. The cementitious substrate shall be cured for a minimum of at least 28 days or as recommended by the floor system manufacturer, whichever is more stringent.
- H. Ensure concrete substrate on or below grade are adequately waterproofed beneath and at the perimeter of the slab, and at the earth side of below-grade walls. Care should be taken not to rupture the vapor barrier during the installation.
- I. Ensure the concrete has a compressive strength adequate for the activities for which the facility is designed, and the surface of the slab shall meet specifications including but not limited to, those contained herein. Slab shall properly cure and dry until adequately dry (under normal conditions 50-60 days). Slab shall be free of dust, dirt, grit, paint, grease, oil or any other foreign substances detrimental to the adhesion of the flooring.
- J. The concrete floor temperature will have to be maintained at a minimum of 75°F during the installation, and the General Contractor shall make sure that the moisture content does not exceed 3% (according R.M.A. testing method).
- K. Concrete: Verify that concrete slabs comply with ASTM F 710 and the following:
 - 1. Concrete substrates are dry and free of curing compounds, sealers, hardeners, efflorescence, chloride contamination, moisture, hydrostatic water pressure, excessive capillary water action, or water vapor transmission, and other materials whose presence would interfere with bonding of adhesive. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by floor covering manufacturer.
 - 2. Concrete shall have a tensile strength of not less than 250 to 300 psi.
 - a. Deflection: As recommended by the floor finish manufacturer for the installation. If none is recommended, then deflection shall not exceed 1/360 of span when measured with a 300 pound concentrated load. Span is considered the longest distance across the floor finish installation as well as the smaller span between two joists and studs.
 - 3. Concrete Surface Profile
 - a. Using the replicate rubber specimens inspect the concrete surface profile in accordance with ICRI Guide No. 03732. This should be performed once for every 100 square feet of surface area to be coated.
 - 4. pH Testing
 - 1. Concrete shall have a pH range of 7-9 or as recommended by the sealer manufacturer. The pH of the concrete substrates will be measured using pH indicating papers. pH testing is to be performed once every 100 sq. ft. of surface area to be coated.
 - 2. Acceptable pH values shall be between 8.0 and 11.0 as measured by a full-range (1-12) color indicating pH paper with readable color calibrations and a scale at whole numbers (minimum). Use Hydrion Insta-Chek Jumbo 0-13 or 1-12 or equal. The paper shall be touched to the surface once using moderate finger pressure. The surface shall not be wiped or moved laterally to disturb the surface during pH testing. Following the one touch, lift the paper vertically to not "wipe" the surface. Compare the color indicated with the scale provided and record the pH.

3. Note: If the surface of the concrete is dry, it is not possible to take a pH measurement. However, pH values are still important on dry surfaces. When a dry concrete substrate is encountered for a pH test, the surface where the pH test is to be performed shall be sprayed lightly with distilled, deionized water from a commercially available spray bottle that has been properly rinsed to preclude any dissolved solids. The spray shall just wet the surface to a “shiny” appearance. Wait 60 seconds to allow chemical equilibrium to be established and then test the pH of the water on the surface. Perform this test in accordance with ASTM D4262.
5. Moisture Testing: Perform moisture on the concrete surfaces according to Flooring Industry Guidelines as recommended by floor covering manufacturer. Ensure that the results of these tests comply with the floor manufacturer’s requirements. Moisture levels shall be within the sealer manufacturer’s requirements.
 - a. Plastic sheet Test: Once for every 500 square feet of surface area to be coated, perform the plastic sheet test in accordance with ASTM D4263. If moisture is indicated, proceed to step 2 below
 - b. Calcium and Relative Humidity Tests:
 - c. The moisture content of the floors shall be within the requirements for the type floor to receive floor covering when tested for moisture content using, as a minimum, the calcium chloride moisture test per ASTM F1869, relative humidity test per ASTM F2170, or a combination of tests as recommended by the floor covering manufacturer to ensure that moisture does not affect adhesion, performance, or appearance of the floor covering. Where tests indicate moisture levels above those recommended by the floor covering manufacturer, then comply with all recommendations and requirements by the floor covering manufacture to bring conditions to a satisfactory level.
 - d. Perform calcium chloride moisture tests in accordance with ASTM D1869 once for every 1000 square feet of surface area to be coated. The maximum limit for moisture vapor emissions rate should be 3.0 lbs. per 24 hours per 1000 sq. ft. If tests indicate rates higher than 3.0, consult with floor finish covering manufacturer’s Technical Service Department for further evaluation.
6. Conduct sounding tests, as recommended by the sealer manufacturer, to locate voids and to determine the integrity of the concrete. Record results of all tests and send copies to the Owner and Architect. Show on a floor grid where each test was conducted and the test results. As a minimum, each report shall include the following information for each test that was conducted:
 - a. Project name
 - c. Date and Time of the Test
 - d. Test Location (wall, room, etc) of test.
 - e. Type sounding test conducted
 - f. Name of person conducting test
 - g. Test results
- L. Do not proceed with the work until unsatisfactory conditions have been corrected by the Contractor in a manner acceptable to the manufacturer and Architect.

3.2 PREPARATION

- A. Substrate: Perform preparation and cleaning procedures according to finish floor manufacturer’s instructions for particular substrate conditions involved and as specified. Provide clean, dry and neutral substrate for flooring application.

- B. Remove substrate coatings, including curing compounds, and other substances that are incompatible with the floor covering and that contain soap, wax, oil, or silicone.
- C. The General Contractor shall patch and repair all cracks, voids, and other imperfections of concrete with recommended patching materials. After completion of sanding, patching and leveling, vacuum or sweep entire surface of concrete to remove loose dust and dirt before starting the installation of the material.
- D. Concrete Surfaces: If required, shot-blast, power scarify as required to obtain surface profile for optimum bond of flooring to concrete. Remove sufficient material to provide a sound surface, free of laitance, glaze efflorescence, and any bond-inhibiting curing compounds or form release agents. Remove grease oil and other penetrating contaminants. Repair damaged and deteriorated concrete to acceptable condition. Leave surface free of dust, dirt, laitance and efflorescence. Acid etching shall not be used.
- E. If required, level substrate within to floor covering manufacturers requirements noncumulative, in all directions. Sand or grind protrusions, bumps, and ridges. Patch and repair cracks and rough areas. Fill depressions.
 - 1. If concrete is out of level then it should be properly leveled by an experienced underlayment contractor using cement based material that will provide a minimum of 3,000 p.s.i. compressive strength and sufficient bond to existing clean concrete surface.
 - 2. Use leveling and patching compounds to fill cracks, holes, and depressions in substrate as recommended by the floor covering manufacturer.
- F. Broom or vacuum clean subfloors to be covered. Following cleaning, examine subfloors for moisture, alkaline salts, carbonation, or dust.
- G. The building shall be dry and closed in. Flooring installation shall not begin until the installer is familiar with existing sub-floor conditions, and after completion of all other work in this area. During cold weather the room temperature shall be maintained at a minimum of 75°F.

3.3 SEALING

- A. Ensure that concrete surfaces meet the sealer manufacturer's requirements.
- B. Spray-apply according to manufacturers recommendations by an applicator approved by the manufacturer.
- C. Spray-apply sealer according to sealer manufacturers recommendations by an applicator approved by the manufacturer.
 - 1. Apply sealer evenly
 - 2. Keep surfaces damp
 - 3. Do not allow sealer to puddle

END OF SECTION 09 05 17

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Suspension systems for interior ceilings and soffits.

1.3 ACTION SUBMITTALS

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

PART 2 - PRODUCTS

2.1 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
 - 2. Protective Coating: ASTM A 653/A 653M, G60, hot-dip galvanized unless otherwise indicated.

2.2 SUSPENSION SYSTEMS

- A. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.062-inch-diameter wire, or double strand of 0.048-inch-diameter wire.
- B. Hanger Attachments to Concrete:
 - 1. Expansion Anchors: Fabricated from corrosion-resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E 488/E 488M conducted by a qualified testing agency.
 - 2. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with allowable load capacities calculated according to ICC-ES AC70, greater than or equal to the design load, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.
- C. Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.16 inch in diameter.

- D. Flat Hangers: Steel sheet, 1 by 3/16 inch by length indicated.
- E. Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 0.0538 inch and minimum 1/2-inch-wide flanges.
 - 1. Depth: 2 inches, unless otherwise indicated.
- F. Furring Channels (Furring Members):
 - 1. Cold-Rolled Channels: 0.0538-inch uncoated-steel thickness, with minimum 1/2-inch-wide flanges, 3/4 inch deep.
 - 2. Steel Studs and Runners: ASTM C 645.
 - a. Minimum Base-Metal Thickness: 0.0179 inch.
 - b. Depth: As indicated on Drawings.
 - 3. Hat-Shaped, Rigid Furring Channels: ASTM C 645, 7/8 inch deep.
 - a. Minimum Base-Metal Thickness: 0.0179 inch.
 - 4. Resilient Furring Channels: 1/2-inch-deep members designed to reduce sound transmission.
 - a. Configuration: Asymmetrical.
- G. Grid Suspension System for Gypsum Board Ceilings: ASTM C 645, direct-hung system composed of main beams and cross-furring members that interlock.
 - 1. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:
 - a. **Armstrong World Industries, Inc.**
 - b. **Chicago Metallic Corporation.**
 - c. **United States Gypsum Company.**

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards.
 - 1. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates, with Installer present, and including welded hollow-metal frames, cast-in anchors, and structural framing, for compliance with requirements and other conditions affecting performance of the Work.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength.

3.3 INSTALLATION, GENERAL

- A. Installation Standard: ASTM C 754.
 - 1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.
- B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.
- C. Install bracing at terminations in assemblies.

3.4 INSTALLING SUSPENSION SYSTEMS

- A. Install suspension system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.
 - 1. Hangers: 48 inches o.c.
 - 2. Carrying Channels (Main Runners): 48 inches o.c.
 - 3. Furring Channels (Furring Members): 16 inches o.c.
- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Suspend hangers from building structure as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices.
 - a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.

3. Wire Hangers: Secure by looping and wire tying, either directly to structures or to inserts, eye screws, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 4. Flat Hangers: Secure to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices and fasteners that are secure and appropriate for structure and hanger, and in a manner that will not cause hangers to deteriorate or otherwise fail.
 5. Do not attach hangers to steel roof deck.
 6. Do not attach hangers to permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
 7. Do not attach hangers to rolled-in hanger tabs of composite steel floor deck.
 8. Do not connect or suspend steel framing from ducts, pipes, or conduit.
- D. Seismic Bracing: Sway-brace suspension systems with hangers used for support.
- E. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.
- F. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 09 22 16

SECTION 09 91 13 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on exterior substrates.
- B. Related Requirements:
 - 1. Section 051200 "Structural Steel Framing" for shop priming of metal substrates.
 - 2. Section 055000 "Metal Fabrications" for shop priming metal fabrications.
 - 3. Section 133419 "Metal Building Systems" for shop priming metal substrates associated with metal building system.

1.3 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- E. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
 - 2. Indicate VOC content.

- B. Samples for Initial Selection: For each type of topcoat product.
- C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches square.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- D. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. of each material and color applied.

1.6 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft.
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.
 - 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.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.8 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equivalent MPI listed manufacturer:
 - 1. Benjamin Moore & Co.
 - 2. PPG Architectural Finishes.
 - 3. Sherwin-Williams Co.

2.2 PAINT, GENERAL

- A. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- B. Colors: As selected by Architect from manufacturer's full range.

2.3 EXTERIOR METAL PRIMERS

- A. Primer, Epoxy, Anti-Corrosive, for Metal: MPI #101.
 - 1. Basis-of-Design Product: Sherwin-Williams; Duraplate 235 Multi-Purpose Epoxy, B67W235.

2.4 EXTERIOR WATER-BASED PAINTS

- A. Light Industrial Coating, Exterior, Water Based, Gloss (Gloss Level 6): MPI #164.
 - 1. Basis-of-Design Product: Sherwin-Williams; S-W Pro Industrial™ Acrylic Gloss Coating, B66W00611Series.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
- C. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer but not less than the following:
 - 1. SSPC-SP 3.
- E. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.

2. Paint surfaces behind movable items same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed items with prime coat only.
 3. Paint both sides and edges of exterior doors and entire exposed surface of exterior door frames.
 4. Paint entire exposed surface of window frames and sashes.
 5. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
 6. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to topcoat manufacturers.
- B. Tint undercoats same color as topcoat, but tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness.
1. Contractor shall touch up and restore painted surfaces damaged by testing.
 2. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 EXTERIOR PAINTING SCHEDULE

- A. Galvanized-Metal Substrates:

1. Water-Based Light Industrial Coating System: MPI EXT 5.3K.
 - a. Prime Coat: Primer, epoxy, anti-corrosive, for metal.
 - b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, exterior, water based, gloss (Gloss Level 6).

B. Steel Substrates:

1. Water-Based Light Industrial Coating System: MPI EXT 5.1N
 - a. Prime Coat: Primer, epoxy, anti-corrosive, for metal.
 - b. Intermediate Coat: Light industrial coating, exterior, water based, matching topcoat.
 - c. Topcoat: Light industrial coating, exterior, water based, gloss (Gloss Level 6).

END OF SECTION 09 91 13

SECTION 10 44 13 - FIRE EXTINGUISHER CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Portable fire extinguishers.
 - 2. Fire-extinguisher cabinets and mounting brackets.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire-protection cabinets and mounting brackets.
 - 1. Fire Extinguishers: Include rating and classification.
 - 2. Fire-Protection Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain fire extinguishers and fire-protection cabinets through one source from a single manufacturer.
- B. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Portable Fire Extinguishers."
- C. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

1.5 COORDINATION

- A. Coordinate size of fire-protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.

1.6 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of portable fire extinguishers that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Failure of hydrostatic test according to NFPA 10.
 - b. Faulty operation of valves or release levers.
 - 2. Warranty Period: Six years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Stainless-Steel Sheet: ASTM A 666, Type 304.
- B. Tempered Float Glass: ASTM C 1048, Kind FT, Condition A, Type I, Quality q3, 3 mm thick, Class 1 (clear).

2.2 PORTABLE FIRE EXTINGUISHERS

- A. Available Manufacturers:
 - 1. JL Industries, Inc.
 - 2. Larsen's Manufacturing Company.
- B. General: Provide fire extinguishers of type, size, and capacity for each fire-protection cabinet indicated.
 - 1. Valves: Nickel-plated polished brass body.
 - 2. Handles and Levers: Stainless steel.
 - 3. Instruction Labels: Include pictorial marking system complying with NFPA 10, Appendix B and bar coding for documenting fire extinguisher location, inspections, maintenance, and recharging.
- C. Multipurpose Dry-Chemical Type: UL-rated 4-A:80-B:C, 10-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

2.3 FIRE-PROTECTION CABINET (FEC)

- A. Available Manufacturers:
 - 1. JL Industries, Inc. – Model SS-2712-RL (Basis of Design).
 - 2. Larsen's Manufacturing Company.
- B. Cabinet Type: Suitable for fire extinguisher.

- C. Cabinet Construction: Nonrated.
- D. Cabinet Material: Stainless steel sheet.
- E. Semirecessed Cabinet: Cabinet box partially recessed in walls of shallow depth to suit style of trim indicated; with one-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).
 - 1. Rolled-Edge Trim: 2-1/2-inch backbend depth.
- F. Door and Trim Material: Stainless steel sheet.
- G. Door Style: Vertical duo panel with frame.
- H. Door Glazing: Tempered float glass (clear).
- I. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
 - 1. Provide manufacturer's standard.
 - 2. Provide continuous hinge, of same material and finish as trim, permitting door to open 180 degrees.
- J. Mounting Brackets: Manufacturer's standard steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with baked-enamel finish.
- K. Accessories:
 - 1. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as directed by Architect.
 - a. Identify fire extinguishers with the words "FIRE EXTINGUISHER."
- L. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
 - 1. Identify fire extinguisher in fire-protection cabinet with the words "FIRE EXTINGUISHER."
 - a. Location: Applied to cabinet door.
 - b. Application Process: Silk-screened.
 - c. Lettering Color: White.
 - d. Orientation: Vertical.

2.4 MOUNTING BRACKETS

- A. Mounting Brackets: Manufacturer's standard steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or red baked-enamel finish.

- B. Identification: Lettering complying with authorities having jurisdiction for letter style, size, spacing, and location. Locate as indicated by Architect.
 - 1. Identify bracket-mounted fire extinguishers with the words "FIRE EXTINGUISHER" in red letter decals applied to mounting surface.
 - a. Orientation: Vertical.

2.5 FABRICATION

- A. Fire-Protection Cabinets: Provide manufacturer's standard box (tub), with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated.
 - 1. Weld joints and grind smooth.
- B. Cabinet Doors: Fabricate doors according to manufacturer's standards, from materials indicated and coordinated with cabinet types and trim styles selected.
 - 1. Fabricate door frames with tubular stiles and rails and hollow-metal design, minimum 1/2 inch thick.
 - 2. Miter and weld perimeter door frames.
- C. Cabinet Trim: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

2.6 STAINLESS-STEEL FINISHES

- A. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
- B. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
 - 1. Run grain of directional finishes with long dimension of each piece.
 - 2. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
 - 3. Directional Satin Finish: No. 4.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine walls and partitions for suitable framing depth and blocking where semirecessed cabinets will be installed.
- B. Examine fire extinguishers for proper charging and tagging.
 - 1. Remove and replace damaged, defective, or undercharged units.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare recesses for semirecessed fire-protection cabinets as required by type and size of cabinet and trim style.

3.3 INSTALLATION

- A. General: Install fire-protection specialties in locations indicated on Drawings and at mounting heights indicated below:
 - 1. Fire-Protection Cabinets: 54 inches above finished floor to top of cabinet or 48 inches to the handle of the fire extinguisher.
 - 2. Mounting Brackets: 54 inches above finished floor to top of fire extinguisher.
- B. Fire-Protection Cabinets: Fasten fire-protection cabinets to structure, square and plumb.
 - 1. Unless otherwise indicated, provide recessed fire-protection cabinets. If wall thickness is not adequate for recessed cabinets, provide semirecessed fire-protection cabinets.
 - 2. Fasten mounting brackets to inside surface of fire-protection cabinets, square and plumb.
- C. Mounting Brackets: Fasten mounting brackets to surfaces, square and plumb, at locations indicated.

3.4 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films, if any, as fire-protection specialties are installed, unless otherwise indicated in manufacturer's written installation instructions.
- B. Adjust fire-protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
- C. On completion of fire-protection cabinet installation, clean interior and exterior surfaces as recommended by manufacturer.
- D. Touch up marred finishes, or replace fire-protection cabinets that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by fire-protection cabinet manufacturer.
- E. Replace fire-protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 10 44 13

SECTION 10 57 10 - METAL SHELVING

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 closed metal shelving.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 6 Section "Miscellaneous Carpentry" for wood furring and grounds.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data: Manufacturer's printed data including materials, accessories, construction, finishes, assembly, and installation instructions for shelving and benches.
- C. Shop Drawings: Layout and dimensions of metal shelving. Indicate relationship to adjoining surfaces. Show shelving elevations and details, fillers, trim, base, and accessories. Include shelving numbering sequence. Indicate installation and anchorage requirements.
- D. Samples for Color Verification: Samples showing actual colors prepared on same material to be used for the Work..
- E. Maintenance Instructions: Instructions for cleaning shelving and for adjusting, repairing, and replacing shelving.

1.4 QUALITY ASSURANCE

- A. Single-Source Responsibility: Obtain shelving units and accessories from one manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver shelving until spaces to receive them are clean, dry, and ready for shelving installation.
- B. Protect shelving from damage during delivery, handling, storage, and installation.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide Clipper shelving by Penco or a reviewed substitute.
1. Provide shelving of the type and configuration indicated on the Drawings.

2.2 MATERIALS

- A. Steel Sheet: ASTM A 366, commercial-quality, stretcher-leveled, cold-rolled carbon steel sheet, stretcher leveled, free of buckling, scale, and surface imperfections. Provide in proper gauge for all-welded construction.
- B. Fasteners: Zinc- or nickel-plated steel; low round-head, fin-neck, slotless-type exposed bolt heads; self-locking nuts or lock washers for nuts on moving parts.

2.3 SHELVING COMPONENTS

- A. General: All shelving shall comply with SMA and ANSI MH 28.1-1982. Construct shelving from the following listed components to the sizes, shapes, and configurations indicated on the Drawings. Provide the following components, as needed to produce the required configurations, with the following characteristics:
1. Offset Angle: Offset angle post shall be roll formed and have overall dimensions of 1-1/8 inches wide x 2-1/2 inches deep. The rear flange shall be punched to accept sway braces or backs, the side flange shall be punched to accept side sway braces or side panels.
 2. Posts: All posts shall be punched for clip or nut and bolt construction. Shelves and accessories are to be vertically adjustable on 1 inch centers. Side sway braces or side panels to be attached to the side flange of the post. Bolts, nuts, and sway braces or panels shall not obstruct the full adjustability of the shelves.
 3. Box Post: Box post to be roll formed and have overall dimensions of 3/4 inch wide x 2-7/16 inches deep. Box post to be flush within 1/4 inch of the face of the shelves when assembled.
 4. Side Panels: 24 gauge steel. Each side shall be punched with holes for bolting to posts.
 5. Backs: 24 gauge steel with holes on each side for bolting to angle posts and in the middle for using a back panel clip.
 6. Sway Braces: 12 gauge x 3/4 inch steel punched at each end for bolting to posts and at the center for strength and ease of assembly.
 7. Shelf Clip: One piece 14 gauge rugged compression type to insert into either box or offset angle posts to form a positive four point connection. Clips shall have two claw-like hooks to seat firmly into post slots and two tabs at bottom to seat into post holes for a tight friction connection. All clips for all posts and shelves to be the same. Design shall offer a pre-clipping feature to simplify erection. Finish: zinc plated. All shelves are to have four independently adjustable clips.

8. Shelves: Extra Heavy Duty of width and depth indicated. Manufacture from cold rolled steel in three material thicknesses that provide up to three different shelf capacities per size. Shelves have 1-1/4 inches face on all four sides. Front and rear faces have four 90 deg. bends providing a 3/4 inch x 1-1/4 inches high tubular shape with an 11/16 inch wide flange seated against the underside of the shelf. The flange is spot welded to the underside of the shelf on 3 inches centers. Sides have a 5/8 inch return flange 90 deg. All four corners are closed by lapping and spot welding together. Overall, the shelf depth and width is 1/4 inch less than nominal. Punch shelf for divider adjustment on 1-1/2 inch centers and for attachment of label holders, bin fronts and base fronts. Reinforce using 13 gauge side shelf supports bolted to the posts and 14 gauge 1-5/32 inch high hat shaped center supports held in place by a notch and flange in the side shelf support.
9. Ledger Tops: 14 gauge steel. Face of ledge to be 1-1/8 inches and have a center reinforcing pan. Ledge top to project 1-1/8 inches beyond the face of the post and to have two 14 gauge angles welded to underside for strength and bolting to post. Must be used with box posts below ledge.
10. Ledger Ends : To be manufactured from 14 gauge steel and furnished to give ledge top a finished appearance.
11. Counter Tops: To be 14 gauge steel. Face of counter top to be 1-1/8 inches and project 1-1/8 inches beyond face of post with a welded center reinforcing pan. Units to be furnished with box post front and rear for finished appearance. 14 gauge counter top ends can be furnished at the ends of all rows for a finished appearance.
12. Counter Front: To be 18 gauge steel attached with no exposed fasteners.
13. Base Strip: Shall be 18 gauge steel attached to face of shelf with bolts and nuts to close space between the bottom of the shelf and the floor.
14. Label Holder: Shall be 24 gauge steel with necessary holes for attaching to shelves with plastic push-in fasteners.
15. Shelf Dividers: 6 inches high through 20 inches high shall be 24 gauge, 24 inches high and over shall be 20 gauge. All divider front flanges shall have a 5/16" diameter bead. Top, bottom and rear flanges are 7/8 inch . Dividers less than 24 inches high shall be attached with plastic push-in fasteners, 24 inches and higher are bolted.
16. Partial Dividers: Shall be 18 gauge steel with a 7/8 inch flange at the bottom. Attached with push-in Plastic Button fasteners.
17. Sliding Divider: To be 20 gauge steel manufactured to give infinite lateral adjustability. Divider portion shall be sloped 45 deg. at front, 1/2 inch radius at front corner.
18. Bin Fronts: To be 18 gauge steel. One and two inch high bin fronts shall be bolted to the face of the shelf. Three inch high bin fronts to be attached to the post by use of 16 gauge zinc plated channel clips.
19. Shelf Boxes: To be 20 gauge steel with a rigid curled handle at the front of the box, punched with an integral card holder on front and rear. Box shall be 4-5/8 inches high to fit between shelves on 6 inches centers and shall be slotted to accept dividers on 1" centers.

20. Shelf Box Dividers: To be 20 gauge steel. Punched with an integral card holder.
21. Swing Doors: Consist of a 16 gauge steel frame and 20 gauge doors, reinforced to prevent warping. Doors are riveted to three 5-knuckle hinges and have a three-point latching device with chrome plated key lock handle. Doors to be preassembled in the frame at factory.
22. Sliding Doors: Set of doors is 72 inches wide and cover two 36 inches wide units. Each door shall be 22 gauge with two or more 18 gauge reinforcing pans, recessed handle and nylon glides and rollers. Each set has 16 gauge channels welded at the top and bottom, and 20 gauge channels on the ends. Doors shall be contained in top, bottom and vertical channels. Right hand door has a provision for a cylinder lock.
23. Foot Plates: Shall be 13 gauge zinc plated steel and be used to protect floors.
24. Filler Panels: 18 Gauge minimum steel sheet, factory fabricated.
25. End Panels: Manufacturer's standard 16 Gauge minimum steel sheet end-finishing panels to conceal exposed ends of nonrecessed lockers. Panels shall be designed and installed to conceal all bolt heads and fasteners.
26. Mounting Brackets: Provide brackets and anchors for installing shelving to floor and wall as indicated.
27. Pedestals: Manufacturer's standard steel pedestal supports. Furnish all fastenings and anchorages. Apply manufacturer's standard baked-enamel finish to pedestals.
 - a. Type: Manufacturer's standard heavy-duty pedestal with top flange and base, floor anchored.

2.4 FABRICATION

- A. Fabricate shelving square, rigid, and without warp, or racking and with metal faces flat and free of dents or distortion. Make exposed metal edges free of sharp edges and burrs, and safe to touch. Weld frame members together to form a rigid, 1-piece structure. Weld other joints and connections. Grind exposed weld flush.

2.5 FINISHES, GENERAL

- A. Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applying and designating finishes.
- B. Finish all steel surfaces and accessories, chrome-plated surfaces.
- C. Protect mechanical finishes on exposed surfaces from damage by applying strippable, temporary protective covering prior to shipment.
- D. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within 1/2 of the range of approved samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if

they are within the range of approved samples and they are assembled or installed to minimize contrast.

2.6 STEEL SHEET FINISHES

- A. Surface Preparation: Solvent-clean surfaces complying with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel complying with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling), and phosphatize surfaces.
- B. All painted parts shall be selected from a minimum of five standard colors. Materials shall be cleaned and phosphatized in a multi-stage process, dried in a 400 degrees oven and electrostatically spray painted with a high grade enamel and baked on at 360 degrees.
 - 1. Color and Gloss: As selected by the Architect.

PART 3 – EXECUTION

3.1 INSTALLATION

- 1. Install metal shelving complete with accessories according to manufacturer's recommendations. Install true, plumb, level, rigid, and flush.
- 2. Connect together welded shelving groups with standard fasteners according to manufacturer's recommendations, with no exposed fasteners on face frames.
- 3. Anchor shelving to floors and walls at intervals recommended by manufacturer but no greater than 36 inches. Install anchors through back-up reinforcing plates where necessary to avoid metal distortion, using concealed fasteners.
- 4. Install recess trim to recessed shelving using concealed fasteners. Provide hairline joints and concealed splice plates.
- 5. Install boxed end panels to conceal exposed ends of shelving.

3.2 ADJUSTING, CLEANING, AND PROTECTION

- A. Adjust shelving to be plumb, level, and rigid without wobble, rattle, warp, racking, or other distortion.
- B. Clean interior and exposed exterior surfaces and polish stainless-steel and nonferrous metal surfaces.
- C. Protect shelving from damage, abuse, dust, dirt, stain, or paint. Do not permit shelving use during construction.
- D. Touch up marred finishes, or replace shelving units that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by shelving manufacturer.

END OF SECTION 10 57 10

SECTION 10 73 13 – MANUFACTURED METAL CANOPIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Pre-engineered metal canopies.

1.3 PERFORMANCE REQUIREMENTS

- A. General Performance: Metal canopies shall comply with performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- B. Structural Performance: Provide metal canopy assemblies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592:
 - 1. Wind Loads: Determine loads based on the minimum design wind pressures as indicated on Drawings.
 - 2. Snow Loads: 25 lbf/sq. ft.
 - 3. Deflection Limits: Metal canopy assemblies shall withstand wind and snow loads with vertical deflections no greater than 1/180 of the span.
- C. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes. 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.

1.4 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal canopy.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work. Canopy supplier to furnish complete canopy CAD drawings signed and sealed by a professional engineer licensed in the state where the canopy will be installed.

1. Design Data: Design calculations bearing the seal of a Registered Professional Engineer, licensed in the state where the project is located. Design calculations shall state that the canopy system design complies with the wind requirements of ASCE 7, the stability criteria of applicable building code, and all other governing criteria.

C. Samples for Verification: For each type of exposed finish required, prepared on 6-by-6-inch square Samples.

D. Maintenance Data: For metal canopies and finishes to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Product Options: Drawings indicate size, profiles, and dimensional requirements of metal canopies and are based on the specific system indicated. Refer to Division 01 Section "Product Requirements."

1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

B. Welding: Qualify procedures and personnel according to the following:

1. Perform welding in accordance with ANSI/AWS D1.2, Structural Welding Code - Aluminum.
2. Provide an all welded extruded aluminum system complete with internal drainage. Non-welded systems are not acceptable.

C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.6 PROJECT CONDITIONS

A. Field Measurements: Contractor shall verify actual locations of walls and other construction contiguous with pre-engineered metal canopy by field measurements before fabrication and indicate measurements on Shop Drawings.

1. Established Dimensions: Contractor shall, where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating metal canopy without field measurements. Coordinate wall, floor, and other contiguous construction to ensure that actual dimensions correspond to established dimensions.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal canopies that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

- a. Structural failures.
 - b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
2. Warranty Period: One year from date of Substantial Completion.
- B. Special Warranty on Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal canopies that show evidence of deterioration of factory-applied finishes within specified warranty period.
1. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Peachtree Protective Covers, Inc.
 2. Dittmer Architectural Aluminum.
 3. Avadek Walkway Cover Systems.
 4. Mitchell Metal.

2.2 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.3 NONFERROUS METALS

- A. Aluminum Extrusions: ASTM B 221, Alloy 6063-T6.
- B. Aluminum Flashing: ASTM B 209, Type 3003 H14, 0.040 inch, minimum.

2.4 FASTENERS

- A. Fasteners: Aluminum, 18-8 stainless steel, or 300 series stainless steel.

2.5 MISCELLANEOUS MATERIALS

- A. Gaskets: Neoprene "O" ring beneath conical washers.
- B. Protective Coating for Aluminum Columns Embedded in Concrete: Clear acrylic.
- C. Gaskets: Dry seal santoprene pressure type.

- D. Aluminum Flashing: ASTM B 209, Type 3003 H14, 0.040 inch, minimum.
- E. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for exterior applications.

2.6 FABRICATION

- A. General: Assemble components in shop to greatest extent possible to minimize field assembly. Pre-engineered metal canopy shall be capable of withstanding structural and other loads indicated, thermally induced movement, and exposure to weather without failure or infiltration of water.
- B. Form metal canopies to required shapes and sizes, with true lines and angles, square, rigid, and without warp, with metal faces flat and free of dents or distortion. Make exposed metal edges and corners free of sharp edges and burrs, and safe to touch.
- C. Bent Construction: Factory assemble beams to columns to form one-piece rigid bents. Where used make welds smooth and uniform using an inert gas shielded arc. Perform suitable edge preparation to assure 100% penetration. Grind welds only where interfering with adjoining structure to allow for flush connection. Field welding is not permitted. Rigid mechanical joints can be used if supported by engineering calculations and/or testing.
- D. Deck Construction: Fabricate from extruded modules that interlock in a self-flashing manner. Positively fasten interlocking joints creating a monolithic structural unit capable of developing the full strength of the sections. The fastenings must have minimum shear strength of 350 pounds each. Assemble deck with sufficient camber to offset dead load deflection.
- E. Columns: Provide radius-cornered tubular extrusions with cutout and internal diverter for drainage where indicated. Circular downspout opening in column not acceptable.
- F. Beams: Provide open-top tubular extrusion, top edges thickened for strength and designed to receive deck members in self-flashing manner.
- G. Deck: Extruded self-flashing sections interlocking into a composite unit. Provide welded plate closures at deck ends.
- H. Fascia: Manufacturer's standard shape. Provide fascia splices where continuous runs of fascia are jointed. Locate splices to be in line with bents and fasten in place on hidden or non-vertical surfaces.
- I. Comply with ANSI/AWS D1.2 for recommended practices in shop welding. Provide welds behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded joints of flux, and dress exposed and contact surfaces.
- J. Where dissimilar metals will contact each other, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturers of dissimilar metals.

2.7 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.8 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. High-Performance Organic Finish (2-Coat Fluoropolymer): AA-C12C40R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: conversion coating; Organic Coating: manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with AAMA 2605 and with coating and resin manufacturers' written instructions.
 - 1. Colors and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, roughing-in openings, clearances, and other conditions affecting performance of work.
 - 1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install metal canopies level and plumb, according to manufacturer's written instructions and roughing-in drawings.

1. Metal Protection: Where metals will contact grout, concrete, masonry, wood, or dissimilar metals, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturers of dissimilar metals.

B. Bolted Connections:

1. All structural erection bolts to conform to ASTM A325.
2. Flat structural washers (minimum of one) shall be used on all bolted connections
3. All bolts shall be tightened using AISC turn-of-the-nut method (unless otherwise specified).

C. Screws:

1. Fastening shall be performed per installation prints provided by the manufacturer.
2. Installation screws shall be furnished with electrode deposited cadmium coating unless otherwise noted.
3. Self-drilling and self-tapping screws shall have a sufficient cut point and a ½-inch O.D. dished tapping metal backed neoprene washer.

D. Erect protective cover true to line, level, and plumb.

1. Protect aluminum columns embedded in concrete with clear acrylic. Fill downspout columns with grout to the discharge level to prevent standing water. Install weep holes at top of concrete in non-draining columns to remove condensation.

E. Provide hairline miters and fitted joints.

3.3 ADJUSTING, CLEANING, AND PROTECTION

- A. Remove temporary protective coverings and strippable films, if any, as metal canopies are installed, unless otherwise indicated in manufacturer's written installation instructions.
- B. Touch up marred finishes, or replace metal canopies that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by metal canopy manufacturer.
- C. Replace metal canopies that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 10 73 13

SECTION 13 34 19 - METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

- 1. Structural-steel framing, including purlins, girts, overhead door frames and miscellaneous associated steel members.
- 2. Accessories.

- B. Related Sections:

- 1. Division 03 Section "Cast-in-Place Concrete" for associated concrete and attachments.
- 2. Division 05 Section "Cold Formed Metal Framing" for steel studs.
- 3. Division 07 Section "Metal Wall Panels" for insulated metal wall panels.
- 4. Division 07 Section "Metal Roof Panels" for insulated metal roof panels.
- 5. Division 08 Section "Overhead Coiling Doors."

1.3 DEFINITIONS

- A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in referenced standards.

1.4 SUBMITTALS

- A. Product Data: For each type of metal building system component. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:

- 1. Structural-steel-framing system.
- 2. Insulation and vapor retarder facings.
- 3. Flashing and trim.
- 4. Accessories.

- B. Shop Drawings: For the following metal building system components. Include plans, elevations, sections, details, and attachments to other work.

1. Structural-Framing Drawings: Show placement of primary and secondary framing; include provisions for openings, where required by drawings and visual inspection by contractor. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
 2. Accessory Drawings: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches:
 - a. Flashing and trim.
 - b. Gutters.
 - c. Downspouts.
- C. Samples for Initial Selection: For units with factory-applied color finish.
- D. Samples for Verification: For each type of exposed finish required, prepared on Samples of sizes indicated below:
1. Flashing and Trim: Nominal 12 inches long. Include fasteners and other exposed accessories.
 2. Accessories: Nominal 12-inch- long Samples for each type of accessory.
- E. Delegated-Design Submittal: For metal building systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- F. Qualification Data: For qualified erector.
- G. Welding certificates.
- H. Metal Building System Certificates: For each type of new metal building component or system, from manufacturer.
- I. Erector Certificates: For each product, from manufacturer.
- J. Manufacturer Certificates: For each product, from manufacturer.
- K. Material Test Reports: For each of the following products:
1. Structural steel including chemical and physical properties.
 2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 3. Tension-control, high-strength, bolt-nut-washer assemblies.
 4. Shop primers.
- L. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for insulation and vapor-retarder facings. Include reports for thermal resistance, fire-test-response characteristics, water-vapor transmission, and water absorption.
- M. Source quality-control reports.
- N. Field quality-control reports.

- O. Warranties: Sample of special warranties.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer and member of MBMA.
 - 1. Accreditation: Manufacturer's facility accredited according to the International Accreditation Service's AC472, "Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems."
 - 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer registered in the State of South Carolina.
- B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
- C. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated.
- D. Source Limitations: Obtain metal building system components, including primary and secondary framing, from single source from single manufacturer.
- E. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.3, "Structural Welding Code - Sheet Steel."
- F. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings," for design requirements and allowable stresses.
- G. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.
- H. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to metal building systems including, but not limited to, the following:
 - a. Structural load limitations.
 - b. Construction schedule. Verify availability of materials and erector's personnel, equipment, and facilities needed to make progress and avoid delays.
 - c. Required tests, inspections, and certifications.
 - d. Unfavorable weather and forecasted weather conditions.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components, sheets, and other manufactured items so as not to be damaged or deformed.

1.7 COORDINATION

- A. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide product by one of the following:
1. Butler Manufacturing Company; a BlueScope Steel company.
 2. Ceco Building Systems; Division of NCI Building Systems, L.P.
 3. Nucor Building Systems.
 4. Star Building Systems; an NCI company.
 5. VP Buildings; a BlueScope Steel company.

2.2 METAL BUILDING SYSTEMS

- A. Description: Provide a complete, integrated set of metal building system manufacturer's standard mutually dependent components and assemblies to be replaced as indicated on drawings, that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.
- B. Secondary-Frame Type: Manufacturer's standard purlins and joists and girts, designed to meet current applicable code.

2.3 METAL BUILDING SYSTEM PERFORMANCE

- A. Delegated Design: Design metal building system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Metal building components being replaced shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."
1. Design Loads: As indicated on Drawings.
 2. Deflection Limits: Design metal building system assemblies to withstand design loads with deflections no greater than the following:
 - a. Purlins and Rafters: Vertical deflection of 1/240 of the span.
 - b. Girts: Horizontal deflection of 1/180 of the span.
 - c. Design secondary-framing system to accommodate deflection of primary framing and construction tolerances, and to maintain clearances at openings.

- C. Wind Performance: All new components shall be designed and sized for wind loads in accordance with current IBC Code.
- D. Thermal Movements: Allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering 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.

2.4 STRUCTURAL-STEEL FRAMING

- A. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from either cold-formed, structural-steel sheet or roll-formed, metallic-coated steel sheet, prepainted with coil coating, to comply with the following:
 - 1. Purlins: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; minimum 2-1/2-inch- wide flanges.
 - a. Depth: As required by design.
 - 2. Girts: C- or Z-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees from flange, with minimum 2-1/2-inch- wide flanges.
 - a. Depth: As required by design.
 - 3. Eave Struts: Unequal-flange, C-shaped sections; fabricated from built-up steel plates, steel sheet, or structural-steel shapes; to provide adequate backup for metal panels.
 - 4. Flange Bracing: Minimum 2-by-2-by-1/8-inch structural-steel angles or 1-inch diameter, cold-formed structural tubing to stiffen primary-frame flanges. Flange bracing not permitted in Field House.
 - 5. Sag Bracing: Minimum 1-by-1-by-1/8-inch structural-steel angles.
 - 6. Base or Sill Angles: Minimum 3-by-2-inch zinc-coated (galvanized) steel sheet.
 - 7. Purlin and Girt Clips: Manufacturer's standard clips fabricated from steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
 - 8. Secondary End-Wall Framing: Manufacturer's standard sections fabricated from zinc-coated (galvanized) steel sheet.
 - 9. Framing for Openings: Channel shapes; fabricated from cold-formed, structural-steel sheet or structural-steel shapes. Frame head and jamb of door openings and head, jamb, and sill of other openings.
 - 10. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.
- B. Bracing: Provide adjustable wind bracing as indicated on drawings and as follows:

1. Rods: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50; or ASTM A 529/A 529M, Grade 50; minimum 1/2-inch- diameter steel; threaded full length or threaded a minimum of 6 inches at each end.
 2. Bracing: Provide wind bracing using any method specified above, at manufacturer's option.
- C. Bolts: Provide plain-finish bolts for structural-framing components that are primed or finish painted. Provide hot-dip galvanized bolts for structural-framing components that are galvanized.
- D. Materials:
1. Channels, Angles, M-Shapes, and S-Shapes: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
 2. Plate and Bar: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
 3. Structural-Steel Sheet: Hot-rolled, ASTM A 1011/A 1011M, Structural Steel (SS), Grades 30 through 55, or High-Strength Low-Alloy Steel (HSLAS), Grades 45 through 70; or cold-rolled, ASTM A 1008/A 1008M, Structural Steel (SS), Grades 25 through 80, or High-Strength Low-Alloy Steel (HSLAS), Grades 45 through 70.
 4. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Structural Steel (SS), Grades 33 through 80, or High-Strength Low-Alloy Steel (HSLAS), Grades 50 through 80; with G60 coating designation; mill phosphatized.
 5. Metallic-Coated Steel Sheet Prepainted with Coil Coating: Steel sheet, metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Aluminum-Zinc Alloy-Coated Steel Sheet: ASTM A 792/A 792M, Structural Steel (SS), Grade 50 or 80; with Class AZ50 coating.
 6. Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A, carbon-steel, hex-head bolts; ASTM A 563 carbon-steel hex nuts; and ASTM F 844 plain (flat) steel washers.
 - a. Finish: Hot-dip zinc coating, ASTM A 153/A 153M, Class C.
- E. Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.
1. Apply primer to primary and secondary framing to a minimum dry film thickness of 1 mil.
 - a. Prime secondary framing formed from uncoated steel sheet to a minimum dry film thickness of 0.5 mil on each side.
 2. Prime galvanized members with specified primer after phosphoric acid pretreatment.
 3. Primer: SSPC-Paint 15, Type I, red oxide.
 4. Alternate Acceptable Finish: G30 coating designation; acrylic coated.
- 2.5 THERMAL INSULATION
- A. Refer to Sections 074100 and 074213 for insulated metal roof and wall panels.

2.6 ACCESSORIES

- A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
 - 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.
- B. Refer to Sections 074100 and 074213 for accessories for insulated metal roof and wall panels.
- C. Gutters: Formed from 0.022-inch nominal-thickness, metallic-coated steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match roof fascia and rake trim. Match profile of gable trim, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch- long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."
 - 1. Gutter Supports: Fabricated from same material and finish as gutters.
 - 2. Strainers: Bronze, copper, or aluminum wire ball type at outlets.
 - 3. Color: As selected by Architect.
- D. Downspouts: Formed from 0.022-inch nominal-thickness, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot- long sections, complete with formed elbows and offsets.
 - 1. Mounting Straps: Fabricated from same material and finish as gutters.
 - 2. Color: As selected by Architect.
- E. Pipe Flashing: Premolded, EPDM pipe collar with flexible aluminum ring bonded to base.
- F. Materials:
 - 1. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.
 - 2. Sealants:
 - a. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene-compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape of manufacturer's standard size.
 - b. Joint Sealant: ASTM C 920; one-part elastomeric polyurethane or polysulfide; of type, grade, class, and use classifications required to seal joints and remain weathertight; and as recommended by metal building system manufacturer.

2.7 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to evaluate product.

- B. Testing: Test and inspect shop connections for metal buildings according to the following:
 - 1. Bolted Connections: Shop-bolted connections shall be tested and inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
 - 2. Welded Connections: In addition to visual inspection, shop-welded connections shall be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at inspector's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.
- C. Product will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

2.8 FABRICATION

- A. General: Design components and field connections required for erection to permit easy assembly.
 - 1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
 - 2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.
- B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.
- C. Secondary Framing: Shop fabricate framing components to indicated size and section by roll-forming or break-forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
 - 1. Make shop or field connections by welding or by using non-high-strength bolts.
 - 2. Shop Priming: Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary framing with specified primer after fabrication.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive

structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.

- C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.
- B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION OF STRUCTURAL FRAMING

- A. Erect metal building system according to manufacturer's written erection instructions and erection drawings.
- B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.
- C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.
- D. Align and adjust structural framing before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with framing. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure.
 - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure will be completed and in service.
- E. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.
 - 1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
 - 2. Locate and space wall girts to suit openings such as doors and windows.
 - 3. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.
- F. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
 - 1. Tighten rod and cable bracing to avoid sag.
 - 2. Locate interior end-bay bracing only where indicated.
- G. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.

- H. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.4 METAL PANEL INSTALLATION, GENERAL

- A. Refer to Sections 074100 and 074213 for installation of insulated metal roof and wall panels.

3.5 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.

- 1. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with corrosion-resistant coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.

- B. 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 will be permanently watertight and weather resistant.

- 1. Install exposed flashing and trim that is without excessive oil-canning, 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 and weather-resistant 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 or bayonet-type expansion provisions cannot be used or would not be sufficiently weather resistant and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with mastic sealant (concealed within joints).

- C. Gutters: Join sections with riveted-and-soldered or lapped-and-sealed joints. Attach gutters to eave with gutter hangers spaced as required for gutter size, but not more than 36 inches o.c. using manufacturer's standard fasteners. Provide end closures and seal watertight with sealant. Provide for thermal expansion.

- D. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.

- 1. Provide elbows at base of downspouts to direct water away from building.
- 2. Tie downspouts to underground drainage system indicated.

- E. Pipe Flashing: Form flashing around pipe penetrations. Fasten and seal to panel as recommended by manufacturer.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

B. Tests and Inspections:

1. High-Strength, Field-Bolted Connections: Connections shall be inspected during installation according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
2. Welded Connections: In addition to visual inspection, field-welded connections shall be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at inspector's option:
 - a. Liquid Penetrant Inspection: ASTM E 165.
 - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
 - c. Ultrasonic Inspection: ASTM E 164.
 - d. Radiographic Inspection: ASTM E 94.

C. Product will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

3.7 CLEANING AND PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.
- B. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.
- C. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.
 1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or by SSPC-SP 3, "Power Tool Cleaning."
 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

END OF SECTION 13 34 19

SECTION 31 10 00 - SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing, removing site utilities and abandoning site utilities in place.
7. Temporary erosion- and sedimentation-control measures.

B. Related Sections:

1. Division 01 Section "Temporary Facilities and Controls" for temporary utility services, construction and support facilities, security and protection facilities, and temporary erosion and sedimentation-control measures.
2. Division 01 Section "Execution" for field engineering and surveying.

1.3 DEFINITIONS

- A. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- B. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.
- C. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow.
- D. Topsoil: Top layer of the soil profile consisting of existing native surface topsoil or existing in-place surface soil and is the zone where plant roots grow. Its appearance is generally friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.

- E. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.
- F. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and indicated on Drawings.
- G. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 MATERIAL OWNERSHIP

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

- A. Existing Conditions: Documentation of existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing.
 - 1. Use sufficiently detailed photographs.
 - 2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.
- B. Record Drawings: Identifying and accurately showing locations of capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 QUALITY ASSURANCE

- A. Preinstallation Conference: Conduct conference at Project site

1.7 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
 - 1. Do not proceed with work on adjoining property until directed by Architect.
- C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated. Coordinate with Architectural Plans

- D. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.
- E. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.
- F. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- G. Do not direct vehicle or equipment exhaust towards protection zones.
- H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.
- I. Soil Stripping, Handling, and Stockpiling: Perform only when the topsoil is dry or slightly moist.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Division 31 Section "Earth Moving."
 - 1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.
- B. Antirust Coating: Fast-curing, lead- and chromate-free, self-curing, universal modified-alkyd primer complying with MPI #79, Alkyd Anticorrosive Metal Primer or SSPC-Paint 20 or SSPC-Paint 29 zinc-rich coating
 - 1. Use coating with a VOC content of 420 g/L (3.5 lb/gal.) or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.

- B. Locate and clearly identify trees, shrubs, and other vegetation to remain. Flag each tree trunk at 54 inches (1372 mm) above the ground.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

- A. General: Protect trees and plants remaining on-site according to requirements in Division 01 Section "Tree Protection."
- B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

3.4 EXISTING UTILITIES

- A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.
 - 1. Verify that utilities have been disconnected and capped before proceeding with site clearing.
- B. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place. Coordinate with Electrical and Mechanical Plans for specific information related to steam, power, underground conduit, natural gas, or telephone lines.
 - 1. Arrange with utility companies to shut off indicated utilities.
 - 2. Owner will arrange to shut off indicated utilities when requested by Contractor.
- C. Locate, identify, and disconnect utilities indicated to be abandoned in place.

- D. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify Architect not less than two days in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without Architect's written permission.
- E. Excavate for and remove underground utilities indicated to be removed.
- F. Removal of underground utilities is included in Division 22, Division 23, Division 26, and Division 33 Sections.

3.5 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
 - 1. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated.
 - 2. Completely remove stumps and roots, obstructions, and debris from the site.
 - 3. Use only hand methods for grubbing within protection zones.
 - 4. Chip removed tree branches and dispose of off-site.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm), and compact each layer as specified on design plans, Section 312000 Earthmoving, or to a density equal to adjacent original ground whichever is more stringent.

3.6 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil in a manner to prevent intermingling with underlying subsoil or other waste materials. See geotechnical report for thicknesses.
 - 1. Remove subsoil and nonsoil materials from topsoil, including clay lumps, gravel, and other objects more than 2 inches (50 mm) in diameter; trash, debris, weeds, roots, and other waste materials.
- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.
 - 1. Limit height of topsoil stockpiles to 72 inches (1800 mm).
 - 2. Do not stockpile topsoil within protection zones.
 - 3. Dispose of surplus topsoil. Surplus topsoil is that which exceeds quantity indicated to be stockpiled or reused.
 - 4. Stockpile surplus topsoil to allow for respreading deeper topsoil.

3.7 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.
- B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.
 - 1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.
 - 2. Paint cut ends of steel reinforcement in concrete to remain with two coats of antirust coating, following coating manufacturer's written instructions. Keep paint off surfaces that will remain exposed.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
- B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 31 10 00

SECTION 31 20 00 - EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Preparing and grading subgrades for slabs-on-grade, and landscaping.
 - 2. Excavating and backfilling for buildings and structures.
 - 3. Drainage and moisture-control fill course for slabs-on-grade.
- B. Related Sections: The following Sections contain requirements that relate to this Section.
 - 1. Division 31 Section "Site Clearing" for coordination,

1.3 UNIT PRICES

- A. Rock Measurement: Volume of rock actually removed, measured in original position, but not to exceed the following:
 - 1. 24 inches outside of concrete forms other than at footings.
 - 2. 12 inches outside of concrete forms at footings.
 - 3. 6 inches beneath bottom of concrete slabs on grade.
- B. Unit prices for rock excavation include replacement with approved materials.

1.4 DEFINITIONS

- A. Excavation consists of the removal of material encountered to subgrade elevations and the reuse or disposal of materials removed.
- B. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- C. Drainage Fill: Course of washed granular material supporting slab-on-grade placed to cut off upward capillary flow of pore water.

- D. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the Architect. Unauthorized excavation, as well as remedial work directed by the Architect, shall be at the Contractor's expense.
- E. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.

1.5 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Test Reports: In addition to test reports required under field quality control, submit the following:
 - 1. Laboratory analysis of each soil material proposed for fill and backfill from borrow sources.
 - 2. One optimum moisture-maximum density curve for each soil material.
 - 3. Report of actual unconfined compressive strength and/or results of bearing tests of each stratum tested.

1.6 QUALITY ASSURANCE

- A. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction.
- B. Comply with applicable requirements of NFPA 495--Explosive Materials Code.
- C. Testing and Inspection Service: Testing will be provided as described under Section 01400 – Quality Control to provide a qualified independent geotechnical engineering testing agency to classify proposed on-site and borrow soils to verify that soils comply with specified requirements and to perform required field and laboratory testing.
- D. The Contractor shall fully comply with all provisions of the Contract Documents including, but not limited to, providing and installing such entities as the products, materials, equipment, components, or systems that were proposed at the time bids were received. Except for extenuating circumstances as determined by the Architect, notification of not being able to meet any of the provisions of the Contract Documents or communicating conflicts in the Contract Documents to the Architect will not be considered after receipt of bids; and the Contractor shall fully comply with the Contract Documents at no increase in Contract Sum or Contract Time.

1.7 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt existing utilities serving facilities occupied by the Owner or others except when permitted in writing by the Architect and then only after acceptable temporary utility services have been provided.
 - 1. Provide a minimum 48-hours' notice to the Architect and receive written notice to proceed before interrupting any utility.

- B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shutoff services if lines are active.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.
- B. Satisfactory Soil Materials: ASTM D 2487 soil classification groups GW, GP, GM, SW, SP, and SM; free of rock or gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetation and other deleterious matter.
- C. Unsatisfactory Soil Materials: ASTM D 2487 soil classification groups GC, SC, ML, MH, CL, CH, OL, OH, and PT.
- D. Backfill and Fill Materials: Satisfactory soil materials.
- E. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D 448, coarse aggregate grading size 57, with 100 percent passing a 1-1/2 inch sieve and not more than 5 percent passing a No. 8 sieve.
- F. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.
- C. Erosion Control
 1. Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of water runoff, soil-bearing water runoff, or airborne dust to adjacent properties, walkways, roadways, and structures. The Contractor shall be responsible for all consequential damage and resulting cleanup and repairs caused by soil erosion and discharge of water runoff, and soil-bearing water runoff, or airborne dust to adjacent properties, walkways, roadways, and structures.
 2. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
 3. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 DEWATERING

- A. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.
- C. Lower water table to a minimum depth of at least 2 feet below bearing levels and excavation bottoms during construction.

3.3 EXCAVATION

- A. Classified Excavation: Excavation is classified and includes excavation to required subgrade elevations. Excavation will be classified as earth excavation or rock excavation as follows:
 - 1. Earth excavation includes excavation of pavements and other obstructions visible on surface; underground structures, utilities, and other items indicated to be demolished and removed; together with soil and other materials encountered that are not classified as rock or unauthorized excavation.
 - a. Intermittent drilling or ripping to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation.
 - b. The width of trench excavation for pipe shall be the equal to the pipe diameter plus 16 inches.
 - 2. Rock excavation includes removal and disposal of rock material and obstructions encountered that cannot be removed by the following heavy-duty rock excavating equipment without systematic drilling, blasting, or ripping.
 - a. Rock material includes boulders 1 cu. yd. or more in volume and rock in beds, ledges, unstratified masses, and conglomerate deposits.
 - 3. Rock Excavation
 - a. Massive Rock Excavation: Any material that cannot be excavated with a single tooth ripper drawn by a crawler tractor having a minimum fly wheel power rated not less than 285 horsepower (Caterpillar D-8N or equivalent) and occupying an original volume of at least one cubic yard.
 - b. Trench Excavation: Any material that cannot be excavated with a caterpillar 325 and occupying an original volume of at least 1 cubic yard or more.
 - 4. Rock excavation will be paid by unit prices included in the Contract Documents.
 - 5. Do not excavate rock until it has been classified and cross-sectioned by Architect.

3.4 STABILITY OF EXCAVATIONS

- A. Comply with local codes, ordinances, and requirements of authorities having jurisdiction to maintain stable excavations.

3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1.2 inches. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, installing services and other construction, and for inspections.
 - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.

3.6 APPROVAL OF SUBGRADE

- A. Notify Architect when excavations have reached required subgrade.
- B. When Architect determines that unforeseen unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
 - 1. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for changes in Work.
- C. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by the Architect.

3.7 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending indicated bottom elevation of concrete foundation or footing to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position when acceptable to the Architect.
 - 1. Fill unauthorized excavations under other construction as directed by the Architect.
- B. Where indicated widths of utility trenches are exceeded, provide stronger pipe, or special installation procedures, as required by the Architect.

3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile excavated materials acceptable for backfill and fill soil materials, including acceptable borrow materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent wind-blown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 BACKFILL

- A. Backfill excavations promptly, but not before completing the following:
 - 1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter draining, perimeter insulation.

2. Surveying locations of underground utilities for record documents.
3. Testing, inspecting, and approval of underground utilities.
4. Concrete formwork removal.
5. Removal of trash and debris from excavation.
6. Removal of temporary shoring and bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.10 FILL

- A. Preparation: Remove vegetation, topsoil, debris, wet, and unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placing fills.
 1. Plow, strip, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing surface.
- B. When subgrade or existing ground surface to receive fill has a density less than that required for fill, break up ground surface to depth required, pulverize, moisture-condition or aerate soil and recompact to required density.
- C. Proofroll: Proofroll top surface of remaining material with a 25 to 30-ton four wheel rubber-tired roller making at least four passes over entire location with two passes at 90 degrees to each other. Undercut any areas that rut or pump and backfill as specified.
 1. Under building slabs, use drainage fill material.
 2. Under footings and foundations, use engineered fill.

3.11 MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 3 percent of optimum moisture content.
 1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
 2. Remove and replace, or scarify and air-dry satisfactory soil material that is too wet to compact to specified density.
 - a. Stockpile or spread and dry removed wet satisfactory soil material.

3.12 TOPSOIL

- A. Obtain topsoil from designated stockpile or in the absence of a stockpile provide to meet requirements.

- B. Spread topsoil 4 to 6 inches deep on all graded areas unless shown or stated otherwise. If existing topsoil is insufficient for proper backfilling, coverage and compacting, then obtain, transport, and spread suitable topsoil for other approved and acceptable sources at not additional cost.
- C. Begin spreading operation on the steepest portion of the slope and proceed to the flattest portion of the slope.
- D. After removing the topsoil from the stockpile, re-dress and re-shape the stockpile areas smooth and provide for free draining of surface water.

3.13 COMPACTION

- A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure.
- C. Percentage of Maximum Dry Density Requirements: Compact soil to not less than the following percentages of maximum dry density according to ASTM D698-00:
 - 1. Under Structures, Building Slabs, Steps, Pavement, and Walkways: Compact the top 18 inches below subgrade and each layer of backfill or fill material at a minimum of 98 percent maximum dry density.
 - 2. Under Lawns or Unpaved Areas: Compaction for all other areas shall be a minimum of 95 percent maximum dry density for all structural fill.
 - 3. Future Building Slab Area: Where indicated on the Civil Drawing, compact the top 18 inches below subgrade at 98 percent maximum dry density and each layer of backfill or fill material at 95 percent maximum dry density. If future building area is not indicated, coordinate area to be compacted with the Architect.
 - 4. All Other Areas: Compaction for all other areas shall be a minimum of 95 percent maximum dry density.

3.14 GRADING

- A. General: Uniformly grade areas to a smooth, even surface, free from irregular surface changes. Remove ridges and ruts. Fill depressions. In areas to be grassed, remove stones larger than 1.5 inches in any direction. Comply with COMPACTION requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between existing adjacent grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.
 - 3. Slope finish grade away from perimeter of structure, sidewalks, pads, and pavement, to ensure positive drainage away from structures, sidewalks, pads, and pavement. Slope a minimum of 2 percent (1/4 inch per foot).

3.15 DRAINAGE FILL

- A. Under slabs-on-grade, place drainage fill course on prepared subgrade.
 - 1. Compact drainage fill to required cross sections and thickness.
 - 2. When compacted thickness of drainage fill is 6 inches or less, place materials in a single layer.
 - 3. When compacted thickness of drainage fill exceeds 6 inches thick place materials in equal layers, with no layer more than 6 inches thick nor less than 3 inches thick when compacted.

3.16 FIELD QUALITY CONTROL

- A. Testing Agency Services: Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.
 - 1. Perform field in-place density tests according to ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method), or ASTM D 2937 (drive cylinder method), as applicable.
 - a. Field in-place density tests may also be performed by the nuclear method according to ASTM D 2922, provided that calibration curves are periodically checked and adjusted to correlate to tests performed using ASTM D 1556. With each density calibration check, check the calibration curves furnished with the moisture gages according to ASTM D 3017.
 - b. When field in-place density tests are performed using nuclear methods, make calibration checks of both density and moisture gages at beginning of work, on each different type of material encountered, and at intervals as directed by the Architect.
 - 2. Footing Subgrade: At footing subgrades, perform at least one test of each soil stratum to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of each subgrade with related tested strata when acceptable to the Architect.
 - 3. Building Slab, Parking Lot, and Sidewalk Areas: At subgrade and at each compacted fill and backfill layer, perform at least one field in-place density test for every 5000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
 - 4. Foundation Wall Backfill: In each compacted backfill layer, perform at least one field in-place density test for each 100 feet or less of wall length, but no fewer than two tests along a wall face.
 - 5. Open and Yard Areas: At each compacted layer or fill, perform at least one field in-place density test for every 15000 sq. ft. or less of open and yard areas, but in no case fewer than two tests.
 - 6. Future Building Slab Areas: Perform tests in same manner as previously described for Building Slab areas

- B. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, recompact and retest until required density is obtained.

3.17 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace material to depth directed by the Architect; reshape and recompact at optimum moisture content to the required density.
- C. Settling: Where settling occurs during the Project correction period, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal
 - 1. Transport surplus satisfactory soil to designated storage areas on the Owner's property. Stockpile or spread soil as directed by Architect.
 - 2. Remove waste material, trash, and debris, and legally dispose of it off the Owner's property.
 - 3. Remove unsatisfactory soil and legally dispose of it off the Owner's property.

END OF SECTION 31 20 0

SECTION 31 25 00 - ENVIRONMENTAL PROTECTION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes guidelines pertaining to protection of the environment. Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Environmental protections include:
 - 1. Avoiding erosion and sedimentation.
 - 2. Avoiding air pollution.
 - 3. Avoiding water pollution.
 - 4. Avoiding noise pollution.
 - 5. General housekeeping.
- B. DHEC (South Carolina Department of Health and Environmental Control), Architect, Owner, and authority having jurisdiction may inspect periodically during construction.
- C. Related Sections include the following:
 - 1. Division 01 Section "Execution" for developing a schedule of required tests and inspections.

1.3 DEFINITIONS

- 1. Sediment Basin: Basin designed to collect and detain sediment-laden storm water runoff and release, at a slower rate, a much cleaner, better quality water.
- 2. Diversion Berm and Ditch: Temporary soil berm or ridge, excavated channel, or a combination berm and channel across sloping land to protect work areas or existing storm drains from upslope runoff and to divert sediment-laden water to sediment basins or traps or stable outlets.
- 3. Temporary Sediment Trap: Small, temporary ponding basin formed by an embankment to detain runoff and trap sediment below drainage area of 5 acres or less.
- 4. Silt Fence: Temporary sediment barrier constructed of filter fabric, buried at the bottom, stretched and supported by posts.
 - a. Posts, minimum 10-gauge self-fastener angle steel type, five feet in length.

- b. Wire mesh is required unless a synthetic, extra strength filter fabric providing puncture strength of 50 psi in accordance with ASTM D751 is used, and provided a 6'-0" maximum post spacing is used.

1.4 GENERAL

- A. This section provides requirements and guidelines pertaining to protection of the environment during the construction of this project. The intent of this section is to control and thereby minimize or prevent soil erosion, sedimentation/siltation, air pollution, and water pollution as a result of this project.
- B. Contractor shall be completely responsible for controlling erosion and sedimentation and to prevent damage or nuisance to public and private property caused by erosion or sedimentation from this project. Contractor shall prevent erosion of soil on the site and on adjacent property resulting from his construction activities and shall prevent sediment from leaving the site. Effective sediment and erosion control measures shall be initiated prior to the commencement of any demolition, clearing, grading, excavation, or other operations that will disturb the site or the natural protection provided by the site.
- C. Coordination and Scheduling. Work shall be scheduled to expose areas subject to erosion for the shortest possible time, and natural vegetation shall be preserved to the greatest extent practicable. Temporary storage and construction buildings shall be located and construction traffic shall be routed to minimize soil disturbance and erosion.
 - 1. Install required measures where and as indicated on the drawings. If not indicated, coordinate with the Architect and locate in suitable and applicable locations to provide the necessary control measures.

1.5 RESPONSIBILITIES OF THE CONTRACTOR

- A. In addition to the responsibilities and duties described on the Drawings and in the Specifications, Contractor shall also be responsible for
 - 1. Complying with all provision in the most current South Carolina Department of Health and Environmental Control (DHEC) regulations.
 - 3. Any and all fines and penalties that may be levied by DHEC applicable to site control, water management, dust and noise control, and other applicable pollution attributes.
 - 4. Providing all necessary and required controls as necessary above and beyond those indicated on the Drawings and described in the specifications for, but not limited to, the following:
 - a. Silt
 - b. Dust
 - c. Noise
 - d. Runoff
 - e. Erosion
 - f. Sediment
 - g. Water management
- B. The Contractor shall fully comply with all provisions of the Contract Documents including, but not limited to, providing and installing such entities as the products, materials, equipment, components, or systems that were proposed at the time bids were received. Except for extenuating circumstances as determined by the Office Of the State Engineer (OSE) and Architect, notification of not being able to meet any of the provisions of the Contract Documents

or communicating conflicts in the Contract Documents to the Architect will not be considered after receipt of bids; and the Contractor shall fully comply with the Contract Documents at no increase in Contract Sum or Contract Time.

- C. In addition to the responsibilities and duties described elsewhere in these documents, Contractor shall also be responsible to:
1. DHEC site environmental permits not already obtained by the Owner,
 2. Arrange and coordinate a DHEC pre-construction meeting,
 3. Comply with provisions in the most current DHEC regulations,
 4. Maintain the site as stipulated in the approved DHEC permit,
 5. Fines and penalties levied by DHEC applicable to site control, water management, dust and noise control, and other applicable pollution issues,
 6. Site inspections and reporting,

1.6 COORDINATION

- A. Schedule Work to expose areas subject to erosion for the shortest possible time.
- B. Preserve natural vegetation beyond construction limits.
- C. Locate temporary storage and construction buildings and route construction traffic to minimize soil disturbance and erosion.

PART 2 – PRODUCTS

2.1 EROSION CONTROL MATTING

- A. Jute matting: Uniform open plain weave pattern of single jute yarn, 48 inches in width, plus or minus 1 inch.
1. Yarn of a loosely twisted construction and thickness varying no more than one-half its normal diameter.
 2. 78 warp ends, plus or minus 2, per width of the matting; 41 weft ends, plus or minus 1, per linear yard; and weight average 1.22 pounds per linear yard of the matting; tolerance of plus or minus 5 percent.
- B. Excelsior matting: Wood excelsior, 48 inches in width plus or minus 1 inch, minimum thickness of 1/4 inch, and average weight of 1.07 pounds per linear yard, with a tolerance of plus or minus 5 percent, covered on one side with a woven fabric consisting of twisted paper or cotton cord, mesh size between 1 inch by 1 inch, and 1-1/2 inch by 3 inches.
- C. Jute or excelsior matting for erosion control shall not be dyed, bleached, or otherwise treated in a manner that will result in toxicity to vegetation.
- D. Straw blanket: Landlok 407GR, manufactured by Synthetic Industries, Inc. 100 percent agricultural straw, lightweight, photodegradable, polypropylene top and bottom nets. Top and bottom nets weigh 1.64 pounds per 1,000 square feet. Straw fiber weigh 0.5 pound per square yard.

- E. Filter Fabric: Burlap or synthetic. Wire mesh is required unless a synthetic, extra strength filter fabric providing puncture strength of 50 psi in accordance with ASTM D751 is used, and provided a 6'-0" maximum post spacing is used.
 - 1. Burlap, 7.5 oz. weight and a minimum of 32 inches wide.
 - 2. Synthetic fabric, Mirafi 100X manufactured by Celanese Fibers Co., Bidim C34 manufactured by DuPont Co., or equivalent providing puncture strength of 50 psi in accordance with ASTM D751.
 - 3. For silt fencing needed more than 45 days, use synthetic type.

PART 3 – EXECUTION

3.1 AIR POLLUTION

- A. Open Burning: On-Site burning is not permitted.
- B. Dust Control. Contractor shall control dust throughout the contract period within the project area and at all other areas affected by the construction. This includes, but is not specifically limited to, paved and unpaved roads, haul roads, access roads, disposal sites, borrow pits, and material and equipment storage sites. Dust control measures may include, but are not limited to, wetting down disturbed earth surfaces or eliminating traffic across them, removing accumulations of dirt from paved areas by hand or mechanical means, and washing streets at the end of the work day. Such dust control measures shall be performed when required by the Architect or the controlling agency for streets and roadways.

3.2 NOISE AND WATER POLLUTION

- A. Noise Pollution: : Avoid use of tools and equipment that produce noise above 85 dB at a distance of 25 feet. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site. If noise levels are above acceptable levels, erect sound barriers to control noise or conduct demolition during times that are less disturbing to the Owner or a combination of both.
- B. Water Pollution The Contractor shall exercise every reasonable precaution throughout the construction period to prevent pollution of rivers, streams, and water impoundments. Pollutants such as chemicals, fuels, lubricants, asphalt, bitumen, concrete, grout, raw sewage, pesticides, herbicides, or any other harmful waste shall not be discharged into or alongside any watercourse, impoundment, or channel.

3.3 SEDIMENT AND EROSION CONTROL

- A. General. The project is subject to periodic inspection during construction by the Owner, Architect, OSE, City, and DHEC.
 - 1. Control measures indicated on the Drawings and Specifications consist of, but are not limited to, construction entrances, sediment basins/ponds/traps, diversion ditches and berms, erosion control matting, filter fabric silt fences, stone check dams, riprap outlet stabilization, inlet protection, and temporary fast-growing vegetation or other suitable groundcover,

- a. The Drawings show a workable plan for controlling sediment and erosion during construction. However, they may not show all required sediment and erosion control measures due to Contractors operations, means and methods, and scheduling of the Work.
 - b. Initiate sediment and erosion control measures prior to the commencement of demolition, clearing, grading, excavation, or other operations that will disturb the site or the natural protection provided by the site.
 - c. If the prepared plan for controlling sediment and erosion proves ineffective for the above reasons, add to, change, or revise the sediment and erosion control plan, approach, or measures to make them effective, and as directed by the Architect, Owner, DHEC, or City.
 - d. Costs for additional sediment and erosion control measures shall be considered an incidental obligation of the Contractor and included in the Contract Price. Effective sediment and erosion control will be a condition for recommendation of progress payment applications.
- B. Sediment and erosion control measures shall consist of required and necessary measures and procedures. Measures, as required to control sediment, erosion, and runoff, include, but are not limited to one or a combination of the following: control construction entrances, sediment basins/ponds/traps, diversion ditches and berms, erosion control matting, filter fabric silt fences, stone check dams, riprap outlet stabilization, inlet protection, and temporary fast-growing vegetation or other suitable groundcover, shall be used as necessary to control runoff and erosion. If the plan for controlling sediment and erosion proves ineffective, the Contractor shall add to, change, or revise the sediment and erosion control plan, approach, or measures to make them effective, and as directed by the Architect, Owner, OSE, DHEC, or City, or other local governing authorities. Costs for additional sediment and erosion control measures shall be the Contractor's responsibility. Effective sediment and erosion control will be a condition for recommendation of progress payment applications.
1. Methods. Provide sediment and erosion control practices and measures as required to prevent and control erosion.
 2. Construction Entrances. Provide a gravel area or pad at all points where vehicles enter and leave a construction site. Clear the entrance and exit area of all vegetation, roots, and other objectionable material and properly grade and place gravel to the grade and dimensions shown on the plans. Provide drainage to carry water to a sediment trap or other suitable outlet.
 - a. Maintain the gravel pad in a condition to prevent mud or sediment from leaving the construction site. This may require periodic topdressing with 2-inch stone. Remove immediately objectionable materials spilled, washed, or tracked onto public roadways.
 3. Maintain the gravel pad in a condition to prevent mud or sediment from leaving the construction site. This may require periodic topdressing with 2-inch stone. Contractor shall immediately remove all objectionable materials spilled, washed, or tracked onto public roadways.
 4. Sediment Basins.
 - a. Sediment basins designed to collect and detain sediment-laden storm water runoff and release, at a slower rate, a much cleaner, better quality water shall be constructed as shown on the drawings. If not shown on the Drawings, coordinate with the Architect.
 - b. Inspect sediment basins after each rainfall and remove accumulated sediment as required by the notes on the drawings. Any unusual or damaging situation shall be reported immediately to the Architect in writing within 24 hours of the incident.
 5. Diversion Berms and Ditches. Temporary soil berms or ridges, excavated channels, or a combination berm and channel shall be constructed across sloping land as shown to

- protect work areas or existing storm drains from upslope runoff and/or to divert sediment-laden water to sediment basins or traps or stable outlets.
- a. Inspect temporary diversions once a week and after every rainfall. Remove sediment from the flow area and repair the ridge.
 - B. Report unusual or damaging situation in writing to the Architect within 24 hours of the incident.
 - C. When the protected area is permanently stabilized, remove the ridge and the channel and blend with the natural and new ground levels.
 - D. Provide permanent vegetative cover when construction completed.
6. Provide sufficient room and diversions to permit machine regrading and cleanout. Permanent seeding including reuse of existing topsoil shall be provided after construction.
 8. Inspect temporary diversions once a week and after every rainfall. Remove sediment from the flow area and repair the ridge. Provide a written report of any unusual or potentially damaging conditions to Architect within 24 hours of the incident.
 9. When the protected area is permanently stabilized, the ridge and the channel shall be removed and blended with the natural ground level and seeding shall be provided.
- C. Erosion Control Matting and Straw Blankets. Unless otherwise specified herein or noted on the drawings, jute and excelsior matting shall be placed where needed to aid in stabilizing disturbed areas. Jute or excelsior matting for erosion control shall not be dyed, bleached, or otherwise treated in a manner that will result in toxicity to vegetation.
1. General
 - a. Before seeding, ensure that ground surface is smooth and free from stones, clods, or debris that will prevent contact of the matting with the soil.
 - b. Place matting immediately following seeding.
 - c. Provide blankets on seeded slopes, 3 horizontal to 1 vertical and steeper. Install in accordance with the manufacturer's recommendations.
 2. Jute matting shall be of a uniform open plain weave pattern of single jute yarn, 48 inches in width, plus or minus 1 inch. The yarn shall be of a loosely twisted construction and shall not vary in thickness by more than one-half its normal diameter. There shall be 78 warp ends, plus or minus 2, per width of the matting; 41 weft ends, plus or minus 1, per linear yard; and the weight shall average 1.22 pounds per linear yard of the matting with a tolerance of plus or minus 5 percent.
 3. Excelsior matting shall be wood excelsior, 48 inches in width plus or minus 1 inch, shall have a minimum thickness of 1/4 inch, and the weight shall average 1.07 pounds per linear yard of the matting with a tolerance of plus or minus 5 percent. The excelsior matting shall be covered on one side with a woven fabric consisting of either twisted paper cord or cotton cord having a minimum mesh size of 1 inch by 1 inch, and a maximum mesh size of 1-1/2 inch by 3 inches.
 4. Unless otherwise specified herein or noted on the drawings, jute or excelsior matting may be installed where it is needed to prevent erosion and aid in stabilization of seeded areas and channels. Matting shall be placed immediately following seeding (seeding shall precede installation of matting). The ground surface shall be smooth and free from stones, clods, or debris which will prevent the contact of the matting with the soil. Matting shall be installed in accordance with the details indicated on the drawings and in accordance with the manufacturer's recommendations.
 5. Erosion control straw blankets shall be provided on all seeded slopes, 3 horizontal to 1 vertical and steeper. The erosion control straw blankets shall be constructed of 100 percent agricultural straw and lightweight, photodegradable, polypropylene top and bottom

nets. The approximate weight of the top and bottom nets shall be 1.64 pounds per 1,000 square feet. The approximate weight of the straw fiber shall be approximately 0.5 pound per square yard. The erosion control straw blankets shall be Landlok 407GR as manufactured by Synthetic Industries, Inc. and installed in accordance with the manufacturer's recommendations.

- D. Silt Fence. Comply with ASTM D6461-Standard Specification For Silt Fence Materials
1. Materials
 - a. Fabric: Fibers used in the manufacture of geotextiles for silt fence, and the threads used in joining geotextiles by sewing, shall consist of long-chain synthetic polymers composed of at least 95 % by weight of polyolefins or polyester. They shall be formed into a stable network such that the filaments or yarns retain their dimensional stability relative to each other, including selvages.
 - b. Posts: Wood, steel, or synthetic support posts having a minimum length of 3.3 ft plus the burial depth may be used. They shall be of sufficient strength to resist damage during installation and to the support applied loads due to material build up behind the silt fence.
 - c. Wire or polymer support fence shall be at least 2.5 ft high and strong enough to support applied loads. Polymer support fences shall meet the same ultraviolet degradation requirements as the geotextile.
 2. Construction:
 - a. The geotextile used for temporary silt fence may or may not be supported between posts with wire or polymeric mesh. Values for grab strength, permittivity, ultraviolet stability shall comply with the previously referenced ASTM D6461.
 - b. Minimum Height Above Ground: 2.5 ft.
 - c. Minimum Embedment Depth: 0.5 ft.
 - d. Post Spacing: Maximum post spacing is based on the fabric support or, if unsupported, on elongation as measured in accordance with Test Method D 4632 and as follows:
 - e. Supported Silt Fence: Maximum post spacing of 4 ft.
 - f. Unsupported Silt Fence With Elongation of 50% Or More: Maximum post spacing of 4 ft.
 - g. Unsupported Silt Fence With Elongation <50%: Maximum post spacing of 6.5 ft.
- E. Stone Check Dams.
1. Small temporary stone dams constructed across drainage-ways draining 2 acres or less shall be constructed as shown to reduce flow velocity and minimize erosion in small channels.
 2. Place stone on a synthetic filter fabric foundation as shown on the plans. Fabric shall be Mirafi 100 or equal providing puncture strength of 50 psi in accordance with ASTM D751.
 3. Inspect check dams and channels for drainage after each runoff event. Contractor shall repair erosion and remove sediment at check dams. Stone shall be added to dams to maintain dimensions shown. Any unusual or damaging situation shall be reported immediately to the Architect in writing within 24 hours of the incident.
- F. Temporary Sediment Traps.
1. Small, temporary ponding basins formed by an embankment shall be constructed as indicated on the drawings to detain runoff and trap sediment below drainage areas that are five (5) acres or less.

2. Clear, grub, and strip the area under the embankment of all vegetation, root mat, and top soil. Contractor shall place select fill for the embankment in 9 inch lifts and machine compact. Contractor shall overfill the embankment 6 inches to allow for settlement. Contractor shall construct a riprap spillway over Mirafi 100 or equal synthetic filter fabric. The spillway shall provide for flow discharge to an undisturbed, stable area.
 3. Inspect traps after each rainfall and remove accumulated sediment when the depth exceeds one-half of the design depth. Contractor shall maintain the dimensions of the trap shown on the drawings using specified materials. Any unusual or damaging situation shall be reported immediately to the Architect in writing within 24 hours of the incident.
- G. Outlet Stabilization.
1. Permanent riprap channels at the outlet of a lined channel or storm drain pipe shall be constructed as indicated on the drawings to reduce the flow velocity and dissipate energy.
 2. Excavate and compact the outlet area to the density of the surrounding undisturbed material. Place filter fabric on the prepared subgrade as indicated on the drawings. Filter fabric shall overlap a minimum of one foot. Construct the riprap apron on a zero-percent slope with top elevation level with adjacent ground. Provide seeding of all disturbed areas adjacent to the riprap.
- H. Inlet Protection. Temporary sediment barriers shall be constructed around storm drain inlets as shown on the drawings. Inspect structure after each rainfall and repair as required. Remove sediment when trap reaches one-half capacity. Report any unusual or potentially damaging situations to Architect in writing within 24 hours of each incident.
- I. Maintenance and Removal.
1. All sediment and erosion control devices or measures shall be implemented prior to any land-disturbing activity within the drainage area where they are located and in accordance with the construction sequence indicated on the drawings. Contractor shall periodically check sediment and erosion control measures and clean or otherwise remove silt build-up as necessary to maintain them in proper working order, all in accordance with the these specifications. All sediment and erosion control measures shall be maintained by the Contractor through final completion of the Work.
 2. Noncompliance. Failure of the Contractor to comply with any of the preceding requirements may result in the Contractor receiving formal notification by DHEC to initiate such measures. If compliance is not forthcoming within 48 hours of receipt of notification, the Owner may suspend all or portions of the work pursuant to *South Carolina Storm Water Management and Sediment Control Regulations R.72-300*.
- 3.4 AIR POLLUTION
- A. Open Burning: On-Site burning is not permitted.
- B. Dust Control. Control dust throughout the Contract period within the Project area and other areas affected by the construction. This includes, but is not specifically limited to, paved and unpaved roads, haul roads, access roads, disposal sites, borrow pits, and material and equipment storage sites.
1. Dust control measures may include, but are not limited to, wetting down disturbed earth surfaces or eliminating traffic across them, removing accumulations of dirt from paved areas by hand or mechanical means, and washing streets at the end of the work day.

2. Perform dust control measures when required by the controlling agency for streets and roadways or the Architect.

3.5 WATER POLLUTION

- A. Exercise every reasonable precaution throughout the construction period to prevent pollution of rivers, streams, and water impoundments.
 1. Do not discharge pollutants such as chemicals, fuels, lubricants, asphalt, bitumen, concrete, grout, raw sewage, pesticides, herbicides, or other harmful waste into or alongside a watercourse, impoundment, or channel.

3.6 NOISE POLLUTION

- A. Avoid use of tools and equipment that produce noise above 85 dB at a distance of 25 feet. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.
- B. If noise levels are above acceptable levels, erect sound barriers to control noise or conduct demolition during times that are less disturbing to the Owner or a combination of both.

3.7 GENERAL HOUSEKEEPING

- A. Ensure that all vehicles and equipment have proper, functional, and operable mufflers and noise control apparatus.
- B. To eliminate and control dust during and after site work activities, including demolition, water down grading and excavation areas, drives and roads, parking areas, and disturbed areas that can produce dust from any performed activity resulting from this Contract. Where demolition is a part of the Contract, the same dust and erosion controls apply to all structures being demolished. Perform as much demolition on calm days as possible without interfering with or compromising schedules.
 1. Water down grading and excavation areas, drives and roads, parking areas, and disturbed areas that can produce dust.
 2. Where demolition is a part of the Contract, the same dust and erosion controls apply to structures being demolished. Perform as much demolition on calm days as possible without interfering with or compromising schedule
- C. Hose down trucks including cargo box, wheels, axels, and chassis to remove all dust and debris that may drop during transportation.
 1. Keep vehicle windows clean for visibility
- D. Cover all transport trucks with heavy duty tarps that completely enclose the cargo box. Tarps with holes or rips or that do not properly fit the cargo box are not acceptable. Ensure tarps are properly tied down to prevent flapping, fluttering, or blowing debris.
- E. Ensure that no portion of debris is exposed or extends past any portion of the cargo box during transportation.
- F. Clean up all trash and debris droppings on public and private property resulting from executing this Contact.

- G. Repair all damage to public and private property including buildings, structures, landscaping, roads, and highways that results from executing this contract.
- H. Keep vehicle windows clean for clear, proper, and safe visibility.

END OF SECTION 31 25 00

SECTION 31 31 16 - TERMITE CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following for termite control:

- 1. Soil treatment.

1.3 SUBMITTALS

- A. Product Data: Treatments and application instructions, including EPA-Registered Label.
- B. Product Certificates: Signed by manufacturers of termite control products certifying that treatments furnished comply with requirements.
- C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- 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. Test Results: Furnish written test results, performed by South Carolina Department of Pesticide Regulation, showing that treatment meets requirements of specifications.
- F. Warranties: Special warranties specified in this Section.

1.4 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. **Regulatory Requirements:** Formulate and apply termiticides, and label with a Federal registration number, to comply with EPA regulations and authorities having jurisdiction.
- C. **Standards for Application:** Current edition of South Carolina Division of Regulatory and Public Service Programs Standard 27-1085.

1.5 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.

1.6 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.

1.7 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.
- C. **Warranty Period:** Five years from date of Substantial Completion.
- D. **Monitoring and Continued Service:** Monitoring and continued service with applicator shall be responsibility of the Owner after the first year.

1.8 MAINTENANCE SERVICE

- A. **Continuing Service:** Provide a proposal for continuing service, including monitoring, inspection and retreatment for occurrences of termite activity, from applicator to Owner, in the form of a

standard yearly continuing service agreement, starting on the date of Substantial Completion. State services, obligations, conditions and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1 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. 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. Aventis Environmental Science USA LP; Termidor.
 - 2. Bayer Corporation; Premise 75.
 - 3. Dow AgroSciences LLC; Dursban TC or Equity.
 - 4. FMC Corporation, Agricultural Products Group; Prevail FT.
 - 5. Syngenta; Demon TC.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of the soil, interfaces with earthwork, slab and foundation work, landscaping, and other conditions affecting performance of termite control. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 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.

3.3 APPLICATION, GENERAL

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

3.4 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: Under ground-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. Masonry: Treat voids.
 - 4. 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. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.
- D. Post warning signs in areas of application.
- E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

END OF SECTION 31 31 16

SECTION 32 13 13 - CONCRETE PAVING – CURB AND GUTTER ONLY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes exterior portland cement concrete paving for the following:
 - 1. Roadways.
 - 2. Parking lots.
 - 3. Curbs and gutters.
 - 4. Walkways.
 - 5. Pads
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 31 Section "Earthwork" for subgrade preparation, grading and subbase course.
 - 2. Division 03 Section "Cast-in-Place Concrete" for general building applications of concrete.

1.3 SUBMITTALS

- A. General: Submit the following according to the Conditions of the Contract and Division 01 Specification Sections.
- B. Product data for proprietary materials and items, including reinforcement and forming accessories, admixtures, joint systems, curing compounds, dry-shake finish materials, and others if requested by Architect.
- C. Design mixes for each class of concrete. Include revised mix proportions when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.
- D. Laboratory test reports for evaluation of concrete materials and mix design tests.
- E. Material certificates in lieu of material laboratory test reports when permitted by Architect. Material certificates shall be signed by manufacturer and Contractor certifying that each material item complies with or exceeds requirements. Provide certification from admixture manufacturers that chloride content complies with requirements.
- F. Minutes of preinstallation conference.

1.4 QUALITY ASSURANCE

- A. Concrete Standards: Comply with provisions of the following standards, except where more stringent requirements are indicated.
 - 1. American Concrete Institute (ACI) 301, "Specifications for Structural Concrete for Buildings."
 - 2. ACI 318, "Building Code Requirements for Reinforced Concrete."
 - 3. Concrete Reinforcing Steel Institute (CRSI) "Manual of Standard Practice."
- B. Concrete Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- C. Concrete Testing Service: Responsibility for an independent testing agency is defined in Section 01410 – Testing Laboratory Services to perform materials evaluation tests and to design concrete mixes.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings" and the following:
 - 1. Before installing portland cement concrete paving, meet with representatives of authorities having jurisdiction, Owner, Architect, consultants, independent testing agency, and other concerned entities to review requirements. Notify participants at least 3 working days before conference.
- E. The Contractor shall fully comply with all provisions of the Contract Documents including, but not limited to, providing and installing such entities as the products, materials, equipment, components, or systems that were proposed at the time bids were received. Except for extenuating circumstances as determined by the Architect, notification of not being able to meet any of the provisions of the Contract Documents or communicating conflicts in the Contract Documents to the Architect will not be considered after receipt of bids; and the Contractor shall fully comply with the Contract Documents at no increase in Contract Sum or Contract Time.

1.5 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

PART 2 - PRODUCTS

2.1 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other acceptable panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
 - 1. Use flexible or curved forms for curves of a 100-foot or less radius.
- B. Form Release Agent: Provide commercial formulation form-release agent with a maximum of 350 g/L volatile organic compounds (VOCs) that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 REINFORCING MATERIALS

- A. Reinforcing Bars and Tie Bars: ASTM A 615, Grade 60, deformed.
- B. Plain, Cold-Drawn Steel Wire: ASTM A 82.
- C. Welded Steel Wire Fabric: ASTM A 185.
 - 1. Furnish in flat sheets, not rolls, unless otherwise acceptable to Architect.
- D. Joint Dowel Bars: Plain steel bars, ASTM A 615, Grade 60. Cut bars true to length with ends square and free of burrs.
- E. Supports for Reinforcement: Chairs, spacers, dowel bar supports and other devices for spacing, supporting, and fastening reinforcing bars, welded wire fabric, and dowels in place. Use wire bar-type supports complying with CRSI specifications.
 - 1. Use supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I.
 - 1. Use one brand of cement throughout Project unless otherwise acceptable to Architect.
- B. Fly Ash: ASTM C 618, Type F.
- C. Normal-Weight Aggregates: ASTM C 33, Class 4, and as follows. Provide aggregates from a single source.
 - 1. Maximum Aggregate Size: 1-1/2 inches.
 - 2. Do not use fine or coarse aggregates that contain substances that cause spalling.
 - 3. Local aggregates not complying with ASTM C 33 that have been shown to produce concrete of adequate strength and durability by special tests or actual service may be used when acceptable to Architect.
- D. Water: Potable.

2.4 ADMIXTURES

- A. Provide concrete admixtures that contain not more than 0.1 percent chloride ions.
- B. Air-Entraining Admixture: ASTM C 260, certified by manufacturer to be compatible with other required admixtures.
- C. Water-Reducing Admixture: ASTM C 494, Type A.
- D. High-Range Water-Reducing Admixture: ASTM C 494, Type F or Type G.
- E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

- F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
- G. Available Products: Subject to compliance with requirements, products that may be incorporated in the Work include, but are not limited to, the following:
- H. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Air-Entraining Admixture:
 - a. Air-Tite or Amex 210; Cormix Construction Chemicals.
 - b. Air-Mix or Perma-Air; Euclid Chemical Co.
 - c. Darex AEA or Daravair; W.R. Grace & Co.
 - d. MB-VR or Micro-Air; Master Builders, Inc.
 - e. Sealtight AEA; W.R. Meadows, Inc.
 - f. Sika AER; Sika Corp.
 - 2. Water-Reducing Admixture:
 - a. Chemtard; ChemMasters Corp.
 - b. Type A Series; Cormix Construction Chemicals.
 - c. Eucon WR-75; Euclid Chemical Co.
 - d. WRDA; W.R. Grace & Co.
 - e. Pozzolite Normal or Polyheed; Master Builders, Inc.
 - f. Metco W.R.; Metalcrete Industries.
 - g. Plastocrete 161; Sika Corp.
 - 3. High-Range Water-Reducing Admixture:
 - a. Super P; Anti-Hydro Co., Inc.
 - b. Cormix 2000, PSI Super, or Melmet; Cormix Construction Chemicals.
 - c. Eucon 37; Euclid Chemical Co.
 - d. WRDA 19 or Daracem; W.R. Grace & Co.
 - e. Rheobuild or Polyheed; Master Builders, Inc.
 - f. Superslump; Metalcrete Industries.
 - g. Sikament 300; Sika Corp.
 - 4. Water-Reducing and Accelerating Admixture:
 - a. Q-Set; Conspec Marketing & Manufacturing Co.
 - b. Gilco Accelerator or Lub NCA; Cormix Construction Chemicals.
 - c. Accelguard 80; Euclid Chemical Co.
 - d. Daraset; W.R. Grace & Co.
 - e. Pozzutec 20; Master Builders, Inc.
 - f. Accel-Set; Metalcrete Industries.
 - 5. Water-Reducing and Retarding Admixture:
 - a. Type D Series; Cormix Construction Chemicals.
 - b. Eucon Retarder 75; Euclid Chemical Co.
 - c. Daratard-17; W.R. Grace & Co.
 - d. Pozzolite R; Master Builders, Inc.
 - e. Plastiment; Sika Corporation.

2.5 CURING MATERIALS

- A. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.
- B. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
 - 1. Waterproof paper.
 - 2. Polyethylene film.
 - 3. White burlap-polyethylene sheet.
- C. Clear Solvent-Borne Liquid Membrane-Forming Curing Compound: ASTM C 309, Type I, Class A or B, wax free.
- D. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type I, Class B.
 - 1. Provide material that has a maximum volatile organic compound (VOC) rating of 350 g/L.
- E. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.
- F. Products: Subject to compliance with requirements, provide one of the following:
 - 1. Clear Solvent-Borne Liquid Membrane-Forming Curing Compound:
 - a. Clear Cure; Anti-Hydro Co., Inc.
 - b. Spartan-Cote; The Burke Co.
 - c. All Resin; Conspec Marketing & Mfg. Co.
 - d. Sealco 309; Cormix Construction Chemicals.
 - e. Day-Chem Cure and Seal; Dayton Superior Corp.
 - f. Diamond Clear; Euclid Chemical Co.
 - g. #64 Resin Cure-Clear; Lambert Corp.
 - h. L&M Cure R; L&M Construction Chemicals, Inc.
 - i. Masterkure; Master Builders, Inc.
 - j. 3100 Series; W.R. Meadows, Inc.
 - k. Seal N Kure; Metalcrete Industries.
 - l. Kure-N-Seal; Sonneborn-Chemrex.
 - m. Horn Clear Seal; Tamms/A.C. Horn.
 - 2. Clear Waterborne Membrane-Forming Curing Compound:
 - a. Clear Cure Water Base; Anti-Hydro Co., Inc.
 - b. Spartan Cote WB; The Burke Co.
 - c. W.B. Resin Cure; Conspec Marketing and Mfg. Co.
 - d. Sealco VOC; Cormix Construction Chemicals.
 - e. Safe Cure and Seal (J-18); Dayton Superior Corp.
 - f. Diamond Clear VOX; Euclid Chemical Co.
 - g. Aqua Kure-Clear; Lambert Corp.
 - h. Dress & Seal #22 WB; L&M Construction Chemicals, Inc.
 - i. Masterkure 100W; Master Builders, Inc.
 - j. 1100 Clear Series; W.R. Meadows, Inc.

- k. Metcure; Metalcrete Industries.
- l. Kure-N-Seal WB; Sonneborn-Chemrex.
- m. Horncure 100; Tamms/A.C. Horn.

3. Evaporation Control:

- a. Aquafilm; Conspec Marketing and Mfg. Co.
- b. Eucobar; Euclid Chemical Co.
- c. E-Con; L&M Construction Chemicals, Inc.
- d. Confilm; Master Builders, Inc.
- e. Waterhold; Metalcrete Industries.

2.6 RELATED MATERIALS

- A. Anti-Spalling Mixture: Combination of boiled linseed oil and mineral spirits, complying with AASHTO M-233.
- B. Traffic Paint: Alkyd-resin ready-mixed, complying with AASHTO M 248, Type S.
 - 1. Color: White.
 - 2. Color: Yellow.

2.7 CONCRETE MIX

- A. Prepare design mixes for each type and strength of normal-weight concrete by either laboratory trial batch or field experience methods as specified in ACI 301. For the trial batch method, use a qualified independent testing agency for preparing and reporting proposed mix designs.
 - 1. Do not use the Owner's field quality-control testing agency as the independent testing agency.
 - 2. Limit use of fly ash to 25 percent of cement content by weight.
- B. Proportion mixes according to ACI 211.1 and ACI 301 to provide normal-weight concrete with the following properties:
 - 1. Compressive Strength (28-Day): 4000 psi.
 - 4. Maximum Water-Cement Ratio at Point of Placement: 0.45.
 - 6. Slump Limit at Point of Placement: 3 inches.
 - a. Slump limit for concrete containing high-range water-reducing admixture (superplasticizer): Not more than 8 inches after adding admixture to site-verified 2-to-3-inch slump concrete.
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows with a tolerance of plus or minus 1-1/2 percent:
 - 1. Air Content: 5.5 percent for 1-1/2-inch maximum aggregate.
 - 2. Air Content: 6.0 percent for 1-inch maximum aggregate.
 - 3. Air Content: 6.0 percent for 3/4-inch maximum aggregate.
 - 4. Air Content: 7.0 percent for 1/2-inch maximum aggregate.
 - 5. Air Content: 2.5 to 4.5 percent.

- D. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, project conditions, weather, test results, or other circumstances warrant.

2.8 CONCRETE MIXING

- A. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94.
 - 1. When air temperature is between 85 deg F (30 deg C) and 90 deg F (32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 SURFACE PREPARATION

- A. Proof-roll prepared subbase surface to check for unstable areas and verify need for additional compaction. Do not begin paving work until such conditions have been corrected and are ready to receive paving.
- B. Remove loose material from compacted subbase surface immediately before placing concrete.

3.2 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for paving to required lines, grades, and elevations. Install forms to allow continuous progress of work and so that forms can remain in place at least 24 hours after concrete placement.
- B. Check completed formwork and screeds for grade and alignment to following tolerances:
 - 1. Top of Forms: Not more than 1/8 inch in 10 feet.
 - 2. Vertical Face on Longitudinal Axis: Not more than 1/4 inch in 10 feet.
- C. Clean forms after each use and coat with form release agent as required to ensure separation from concrete without damage.

3.3 PLACING REINFORCEMENT

- A. General: Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars" for placing and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.

- D. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities or replace units as required before placement. Set mats for a minimum 2-inch overlap to adjacent mats.

3.4 JOINTS

- A. General: Construct contraction, construction, and isolation joints true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to the centerline, unless indicated otherwise.
 - 1. When joining existing paving, place transverse joints to align with previously placed joints, unless indicated otherwise.
- B. Contraction Joints: Provide weakened-plane contraction joints, sectioning concrete into areas as shown on Drawings. Minimum spacing shall be 5 feet oc in each direction. Construct contraction joints for a depth equal to at least 1/4 of the concrete thickness, as follows:
 - 1. Tooled Joints: Form contraction joints in fresh concrete by grooving and finishing each edge of joint with a radiused jointer tool.
 - 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into hardened concrete when cutting action will not tear, abrade, or otherwise damage surface and before development of random contraction cracks.
 - 3. Inserts: Form contraction joints by inserting premolded plastic, hardboard, or fiberboard strips into fresh concrete until top surface of strip is flush with paving surface. Radius each joint edge with a jointer tool. Carefully remove strips or caps of two-piece assemblies after concrete has hardened. Clean groove of loose debris.
- C. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than 1/2 hour, unless paving terminates at isolation joints.
 - 1. For concrete 6 inches or more thick, provide preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys, unless indicated otherwise. Embed keys at least 1-1/2 inches into concrete.
 - 2. Continue reinforcement across construction joints unless indicated otherwise. Do not continue reinforcement through sides of strip paving unless indicated.
 - 3. Provide tie bars at sides of paving strips where indicated.
 - 4. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.
- D. Isolation Joints: Form isolation joints of preformed joint filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
 - 1. Locate expansion joints at intervals of 50 feet, unless indicated otherwise.
 - 2. Extend joint fillers full width and depth of joint, not less than 1/2 inch or more than 1 inch below finished surface where joint sealant is indicated. Place top of joint filler flush with finished concrete surface when no joint sealant is required.

3. Furnish joint fillers in one-piece lengths for full width being placed wherever possible. Where more than one length is required, lace or clip joint filler sections together.
 4. Protect top edge of joint filler during concrete placement with a metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- E. Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt-coat one half of dowel length to prevent concrete bonding to one side of joint.

3.5 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice, or frost from subbase surface and reinforcing before placing concrete. Do not place concrete on surfaces that are frozen.
- C. Moisten subbase to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at the required finish elevation and alignment.
- D. Comply with requirements and with ACI 304R for measuring, mixing, transporting, and placing concrete.
- E. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
 1. When concrete placing is interrupted for more than 1/2 hour, place a construction joint.
- F. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- G. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures to consolidate concrete complying with ACI 309R.
 1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocating reinforcing, dowels, and joint devices.
- H. Screed paved surfaces with a straightedge and strike off. Use bull floats or darbies to form a smooth surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces prior to beginning finishing operations.
- I. Place concrete in two operations; strike off initial pour for entire width of placement and to the required depth below finish surface. Lay welded wire fabric or fabricated bar mats immediately in final position. Place top layer of concrete, strike off, and screed.

1. Remove and replace portions of bottom layer of concrete that have been placed more than 15 minutes without being covered by top layer or use bonding agent if acceptable to Architect.
- J. Curbs and Gutters: When automatic machine placement is used for curb and gutter placement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete.
- K. Sidewalks: Form and finish all sidewalks with a crown or slope 1/8 inch per foot to eliminate standing water. Slope surface perpendicular (right angles to) the direction of traffic. Finish to a light broom finish to comply with ADA. Install control joints 5 feet on center unless shown otherwise.
- L. Building Pads: Slope pads so that all drainage is away from the structure. Provide a minimum slope of 1/8 inch per foot.
- M. Slip-Form Pavers: When automatic machine placement is used for paving, submit revised mix design and laboratory test results that meet or exceed requirements. Produce paving to required thickness, lines, grades, finish, and jointing as required for formed paving.
1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of paver machine during operations.
- N. When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.
- O. Cold-Weather Placement: Comply with provisions of ACI 306R and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When air temperature has fallen to or is expected to fall below 40 deg F (4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
 2. Do not use frozen materials or materials containing ice or snow.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.
- P. Hot-Weather Placement: Place concrete complying with ACI 305R and as specified when hot weather conditions exist.
1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 90 deg F (32 deg 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 water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. 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 embedding in concrete.
 3. Fog spray forms, reinforcing steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.6 CONCRETE FINISHING

- A. Float Finish: Begin floating when bleed water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Finish surfaces to true planes within a tolerance of 1/4 inch in 10 feet as determined by a 10-foot-long straightedge placed anywhere on the surface in any direction. Cut down high spots and fill low spots. Refloat surface immediately to a uniform granular texture.
1. Burlap Finish: Drag a seamless strip of damp burlap across concrete, perpendicular to line of traffic, to provide a uniform gritty texture finish.
 2. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across concrete surface perpendicular to line of traffic to provide a uniform fine line texture finish.
 3. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating surface 1/16 inch to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.
- B. Final Tooling: Tool edges of paving, gutters, curbs, and joints formed in fresh concrete with a jointing tool to the following radius. Repeat tooling of edges and joints after applying surface finishes. Eliminate tool marks on concrete surfaces.
1. Radius: 1/4 inch.
 2. Radius: 3/8 inch.

3.7 SPECIAL FINISHES

- A. Nonslip Aggregate Finish: Apply nonslip aggregate finish to paving surfaces indicated.
1. After completing float finish, uniformly spread 25 lb of dampened nonslip aggregate per 100 sq. ft. of surface. Tamp aggregate flush with surface using a steel trowel, but do not force below surface.
 2. After curing, lightly work surface with a steel wire brush or an abrasive stone, and water to expose nonslip aggregate.
- B. Dry-Shake Color Hardener Finish: Apply a dry-shake color hardener finish to indicated paving surfaces as follows:
1. Uniformly apply dry-shake materials at a rate of 100 lb per 100 sq. ft., unless a greater amount is recommended by material manufacturer.
 2. Immediately following the first floating operation, uniformly distribute approximately 2/3 of the dry-shake material over the concrete surface with a mechanical spreader, and embed by power floating. Follow the floating operation with a second shake application, uniformly distributing the remainder of the dry-shake material to ensure uniform color, and embed by power floating.
 3. After final floating, apply a light hand-trowel finish followed by a broom finish to concrete. Cure concrete with a curing compound recommended by the dry-shake material manufacturer. Apply the curing compound immediately after final finishing.
- C. Tactile Warning
1. Imprint tactile warning impressions in concrete at all ramps, landings, and other hazardous areas. Imprinting shall comply with ADA requirements for pattern, location, size, performance, and identity.

2. Imprint size shall comply with ADA
3. Submit a sample of proposed imprinted pattern to the Architect for approval.
4. Prepare a mockup of the proposed tactile warning. Protect and maintain approved mockup which will be used as a standard to evaluate completed work.

3.8 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with the recommendations of ACI 306R for cold weather protection and ACI 305R for hot weather protection during curing.
- B. Evaporation Control: In hot, dry, and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply according to manufacturer's instructions after screeding and bull floating, but before floating.
- C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- D. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
 1. Moisture Curing: Keep surfaces continuously moist for not less than 7 days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with a 12-inch lap over adjacent absorptive covers.
 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to 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.
- E. Boiled Linseed Oil Treatment: Apply boiled linseed oil mixture no sooner than 28 days after placement to clean dry concrete surfaces free of oil, dirt, or other foreign material. Apply in 2 sprayed applications at rate of 40 sq. yd. per gallon for the first application and 60 sq. yd. per gallon for the second application. Allow complete drying between applications.

3.9 TRAFFIC PAINT

- A. Traffic Paint: Apply traffic paint for striping and other markings with mechanical equipment to produce uniform straight edges. Apply at manufacturer's recommended rates to provide a 15-mil minimum wet film thickness.

3.10 FIELD QUALITY CONTROL TESTING

- A. The testing and inspection agency shall sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include the following:
1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
 - a. Slump: ASTM C 143; one test at point of placement for each compressive-strength test but no less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.
 - b. Air Content: ASTM C 231, pressure method; one test for each compressive-strength test but no less than one test for each day's pour of each type of air-entrained concrete.
 - c. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each set of compressive-strength specimens.
 - d. Compression Test Specimens: ASTM C 31; one set of four standard cylinders for each compressive-strength test, unless directed otherwise. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
 - e. Compressive-Strength Tests: ASTM C 39; one set for each day's pour of each concrete class exceeding 5 cu. yd. but less than 25 cu. yd., plus one set for each additional 50 cu. yd. Test one specimen at 7 days, test two specimens at 28 days, and retain one specimen in reserve for later testing if required.
 2. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.
 3. When total quantity of a given class of concrete is less than 50 cu. yd., Architect may waive strength testing if adequate evidence of satisfactory strength is provided.
 4. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.
 5. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength and no individual strength test result falls below specified compressive strength by more than 500 psi.
- B. Test results will be reported in writing to Architect, concrete manufacturer, and Contractor within 24 hours of testing. Reports of compressive strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing agency, concrete type and class, location of concrete batch in paving, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day and 28-day tests.
- C. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted but shall not be used as the sole basis for acceptance or rejection.
- D. Additional Tests: The testing agency will make additional tests of the concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met, as directed by Architect. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

3.11 REPAIRS AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, or defective, or does not meet the requirements of this Section.
- B. Drill test cores where directed by Architect when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to paving with epoxy adhesive.
- C. Protect concrete from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep concrete paving not more than 2 days prior to date scheduled for Substantial Completion inspections.

END OF SECTION 32 13 13

SECTION 32 32 16 - HOT-MIX ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:

- 1. Hot-mix asphalt paving.
- 2. Hot-mix asphalt patching.
- 3. Hot-mix asphalt overlays.
- 4. Asphalt surface treatments:
 - a. Fog seals.
 - b. Slurries.
- 5. Pavement-marking paint.
- 6. Hot-mix asphalt curbs.
- 7. Wheel stops.

- B. Related Sections include the following:

- 1. Division 31 Section "Earthwork" for aggregate subbase and base courses and aggregate pavement shoulders.

1.3 SYSTEM DESCRIPTION

- A. Provide hot-mix asphalt pavement according to the materials, workmanship, and other applicable requirements of the standard specifications of the South Carolina Department of Transportation.

1.4 SUBMITTALS

- A. Job-Mix Designs: Certification of approval of each job mix proposed for the Work.
- B. Shop Drawings: Indicate pavement markings, lane separations, and defined parking spaces. Indicate dedicated handicapped spaces with international graphics symbol.
- C. Samples: 12 by 12 inches minimum, of paving fabric.

- D. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- E. Material Certificates: Certificates signed by manufacturers certifying that each material complies with requirements.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who has completed hot-mix asphalt paving similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.
- B. Manufacturer Qualifications: Engage a firm experienced in manufacturing hot-mix asphalt similar to that indicated for this Project and with a record of successful in-service performance.
- C. Testing Agency Qualifications: Demonstrate to Architect's satisfaction, based on Architect's evaluation of criteria conforming to ASTM D 3666, that the independent testing agency has the experience and capability to satisfactorily conduct the testing indicated without delaying the Work.
- D. Regulatory Requirements: Conform to applicable standards of authorities having jurisdiction for asphalt paving work on public property.
- E. Asphalt-Paving Publication: Comply with AI's "The Asphalt Handbook," except where more stringent requirements are indicated.
- F. Preinstallation Conference: Conduct conference at Project site to comply with requirements of Division 1 Section "Project Meetings" Review methods and procedures related to asphalt paving.
- G. The Contractor shall fully comply with all provisions of the Contract Documents including, but not limited to, providing and installing such entities as the products, materials, equipment, components, or systems that were proposed at the time bids were received. Except for extenuating circumstances as determined by the Architect, notification of not being able to meet any of the provisions of the Contract Documents or communicating conflicts in the Contract Documents to the Architect will not be considered after receipt of bids; and the Contractor shall fully comply with the Contract Documents at no increase in Contract Sum or Contract Time.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver pavement-marking materials to Project site in original packages with seals unbroken and bearing manufacturer's labels containing brand name and type of material, date of manufacture, and directions for storage.
- B. Store pavement-marking materials in a clean, dry, protected location and within temperature range required by manufacturer. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not apply asphalt materials if substrate is wet or excessively damp or if the following conditions are not met:
 - 1. Prime and Tack Coats: Minimum surface temperature of 60 deg F.
 - 2. Slurry Coat: Comply with weather limitations of ASTM D 3910.
 - 3. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
 - 4. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.
- B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials, 50 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. General: Use locally available materials and gradations that have performed satisfactorily in previous installations.
- B. Coarse Aggregate: Sound; angular crushed stone; crushed gravel; complying with SC DOT Section 305.
 - 1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.
- C. Mineral Filler: Rock dust, hydraulic cement, or other inert material complying with ASTM D 242.

2.2 ASPHALT MATERIALS

- A. Asphalt Cement: ASTM D 3381 for viscosity-graded material.
- B. Prime Coat: ASTM D 2027; medium-curing cutback asphalt; MC-30, MC-70, or MC-250.
- C. Tack Coat: ASTM D 977, emulsified asphalt or ASTM D 2397, cationic emulsified asphalt, slow setting, factory diluted in water, of suitable grade and consistency for application.
- D. Water: Potable.

2.3 AUXILIARY MATERIALS

- A. Herbicide: Commercial chemical for weed control, registered by Environmental Protection Agency (EPA). Provide granular, liquid, or wetttable powder form.

- B. Sand: ASTM D 1073, Grade Nos. 2 or 3.
- C. Paving Geotextile: Nonwoven polypropylene, specifically designed for paving applications, resistant to chemical attack, rot, and mildew.
- D. Pavement-Marking Paint: SC DOT Section 710.06 (less glass beads) and FWHA Federal 1952B (Latex).
- E. Pavement-Marking Paint: Latex, water-base emulsion, ready-mixed, complying with FS TT-P-1952.
 - 1. Color: Blue - Handicapped.
 - 2. Color: White.
- F. Wheel Stops: Precast, air-entrained concrete, 2500-psi minimum compressive strength, approximately 6 inches high, 9 inches wide, and 84 inches long. Provide chamfered corners and drainage slots on underside, and provide holes for anchoring to substrate.
 - 1. Dowels: Galvanized steel, diameter 3/4 inch, minimum length 10 inches.

2.4 MIXES

- A. Hot-Mix Asphalt: Provide dense, hot-laid, hot-mix asphalt plant mixes approved by SC DOT; designed according to procedures in AI's "Mix Design Methods for Asphalt Concrete and Other Hot-Mix Types"; and complying with the following requirements:
 - 1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
 - 2. Binder Course: Hot laid asphaltic concrete per SC DOT Section 402.
 - 3. Surface Course: Hot laid asphaltic concrete per SC DOT Section 403.
- B. Emulsified-Asphalt Slurry: ASTM D 3910, consisting of emulsified asphalt, fine aggregates, and mineral fillers and as follows:
 - 1. Composition: Type 2.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that subgrade is dry and in suitable condition to support paving and imposed loads.
- B. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.
- C. Notify Architect in writing of any unsatisfactory conditions. Do not begin paving installation until these conditions have been satisfactorily corrected.

3.2 COLD MILLING

- A. Clean existing paving surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement, including hot-mix asphalt and, as necessary, unbound-aggregate base course, by cold milling to grades and cross sections indicated.
 - 1. Repair or replace curbs, manholes, and other construction damaged during cold milling.

3.3 PATCHING AND REPAIRS

- A. Patching: Saw cut perimeter of patch and excavate existing pavement section to sound base. Recompact new subgrade. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically.
 - 1. Partially fill excavation with dense-graded, hot-mix asphalt base mix and compact while still hot. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.
- B. Crack and Joint Filling: Remove existing filler material from cracks or joints to a depth of 1/4 inch. Refill with asphalt joint-filling material to restore watertight condition. Remove excess filler that has accumulated near cracks or joints.
- C. Tack Coat: Apply uniformly to existing surfaces of previously constructed asphalt or portland cement concrete paving and to surfaces abutting or projecting into new, hot-mix asphalt pavement. Apply at a uniform rate of 0.05 to 0.15 gal./sq. yd. of surface.
 - 1. Allow tack coat to cure undisturbed before paving.
 - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.4 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
 - 1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.
- B. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
 - 1. Mix herbicide with prime coat when formulated by manufacturer for that purpose.
- C. Prime Coat: Apply uniformly over surface of compacted-aggregate base at a rate of 0.15 to 0.50 gal./sq. yd. Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure for 72 hours minimum.

1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use just enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

3.5 HOT-MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt mix on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness, when compacted.
 1. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
 2. Place hot-mix asphalt surface course in single lift.
 3. Spread mix at minimum temperature of 250 deg F.
 4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.
 5. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet wide, except where infill edge strips of a lesser width are required.
 1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete asphalt base course for a section before placing asphalt surface course.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.
- D. Construct light and heavy duty surfaces as follows:
 1. Light Duty: Install where indicated on the Drawings. If not indicated, then install in areas subject to normal vehicular traffic such as automobiles and light duty trucks, including the trailer, having no more than 6 wheels.
 - a. Base Course Aggregate: Thickness as indicated on the Drawings. If not indicated, then 8 inches thick.
 - b. Surface Course: Thickness as indicated on the Drawings. If not indicated, then 2 inches thick per SCDOT Section 403.
 2. Heavy Duty: Install where indicated on the Drawings. If not indicated, then install in areas subject to heavy truck traffic, but are not scheduled to receive concrete paving, such as loading docks, trash receptacles, truck turn-around areas, etc.
 - a. Base Course Aggregate: Thickness as indicated on the Drawings. If not indicated, then 8 inches thick.

- b. Binder Course: Thickness as indicated on the Drawings. If not indicated, then 2 inches thick per SCDOT Section 402.
- c. Surface Course: Thickness as indicated on the Drawings. If not indicated, then 2 inches thick per SCDOT Section 403.

3.6 JOINTS

- A. Construct joints to ensure continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.
 - 1. Clean contact surfaces and apply tack coat.
 - 2. Offset longitudinal joints in successive courses a minimum of 6 inches.
 - 3. Offset transverse joints in successive courses a minimum of 24 inches.
 - 4. Construct transverse joints by bulkhead method or sawed vertical face method as described in AI's "The Asphalt Handbook."
 - 5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
 - 6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.7 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.
 - 1. Complete compaction before mix temperature cools to 185 deg F.
- B. Breakdown Rolling: Accomplish breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Repair surfaces by loosening displaced material, filling with hot-mix asphalt, and rerolling to required elevations.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling, while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
 - 1. Average Density: 96 percent of reference laboratory density according to ASTM D 1559, but not less than 94 percent nor greater than 100 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while still hot, with back of rake or smooth iron. Compact thoroughly using tamper or other satisfactory method.

- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials. Remove paving course over area affected and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.8 INSTALLATION TOLERANCES

- A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 - 1. Base Course: Plus or minus 1/2 inch.
 - 2. Surface Course: Plus 1/4 inch, no minus.
- B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
 - 1. Base Course: 1/4 inch.
 - 2. Surface Course: 1/8 inch.

3.9 SURFACE TREATMENTS

- A. Fog Seals: Apply fog seal at a rate of 0.10 to 0.15 gal./sq. yd. to existing asphalt pavement and allow to cure. Lightly dust areas receiving excess fog seal with a fine sand.
- B. Slurry Seals: Apply slurry coat in a uniform thickness according to ASTM D 3910 and allow to cure.
 - 1. Roll slurry seal to smooth ridges and provide a uniform, smooth surface.

3.10 PAVEMENT MARKING

- A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.
- B. Allow paving to cure for 30 days before starting pavement marking.
- C. Sweep and clean surface to eliminate loose material and dust.
- D. Apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

3.11 WHEEL STOPS

- A. Securely attach wheel stops into pavement with not less than 2 galvanized steel dowels embedded in precast concrete at one-third points. Firmly bond each dowel to wheel stop and to pavement.
 - 1. Extend upper portion of dowel 5 inches into wheel stop and lower portion a minimum of 5 inches into pavement.

3.12 FIELD QUALITY CONTROL

- A. Testing Agency: Responsibility for an independent testing agency is defined in Section 01400 – Quality Control to perform field inspections and tests and to prepare test reports.
 - 1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.
- B. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.
- C. Thickness: In-place compacted thickness of hot-mix asphalt courses will be determined according to ASTM D 3549.
- D. Surface Smoothness: Finished surface of each hot-mix asphalt course will be tested for compliance with smoothness tolerances.
- E. In-Place Density: Samples of uncompacted paving mixtures and compacted pavement will be secured by testing agency according to ASTM D 979.
 - 1. Reference laboratory density will be determined by averaging results from 4 samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 1559, and compacted according to job-mix specifications.
 - 2. Reference maximum theoretical density will be determined by averaging results from 4 samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
 - 3. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.
 - a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, but in no case will fewer than 3 cores be taken.
 - b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.
- F. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

END OF SECTION 32 32 16

SECTION 32 92 00 -GRASSING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Grassing.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 31 Section "Site Clearing" for protection of existing trees and planting, topsoil stripping and stockpiling, and site clearing.
 - 2. Division 31 Section "Earthwork" for excavation, filling, rough grading, and subsurface aggregate drainage and drainage backfill.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product certificates signed by manufacturers certifying that their products comply with specified requirements.
 - 1. Manufacturer's certified analysis for standard products.
 - 2. Analysis for other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
- C. Certification of grass seed from seed vendor for each grass-seed mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
- D. Samples of each of the following:
 - 1. 5 lb of mineral mulch for each color and texture of stone required for Project, in labeled plastic bags.
 - 2. Edging materials and accessories to verify color selected.

- E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and address of architects and owners, and other information specified.
- F. Material test reports from qualified independent testing agency indicating and interpreting test results relative to compliance of the following materials with requirements indicated.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful landscape establishment.
 - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that landscaping is in progress.
- B. Topsoil Analysis: Furnish a soil analysis made by a qualified independent soil-testing agency stating percentages of organic matter, inorganic matter (silt, clay, and sand), deleterious material, pH, and mineral and plant-nutrient content of topsoil.
 - 1. Report suitability of topsoil for growth of applicable planting material. State recommended quantities of nitrogen, phosphorus, and potash nutrients and any limestone, aluminum sulfate, or other soil amendments to be added to produce a satisfactory topsoil.
- C. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Coordinate grass schedule with the Owner for types of grass to be planted, location of grass types, planting times, and maintenance.
- D. The Contractor shall fully comply with all provisions of the Contract Documents including, but not limited to, providing and installing such entities as the products, materials, equipment, components, or systems that were proposed at the time bids were received. Except for extenuating circumstances as determined by the Architect, notification of not being able to meet any of the provisions of the Contract Documents or communicating conflicts in the Contract Documents to the Architect will not be considered after receipt of bids; and the Contractor shall fully comply with the Contract Documents at no increase in Contract Sum or Contract Time.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at site.
- B. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1.6 PROJECT CONDITIONS

- A. Utilities: Determine location of above grade and underground utilities and perform work in a manner which will avoid damage. Hand excavate, as required. Maintain grade stakes until removal is mutually agreed upon by parties concerned.

- B. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Architect before planting.

1.7 COORDINATION AND SCHEDULING

- A. Coordinate installation of planting materials during normal planting seasons for each type of plant material required.

1.8 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Warranty: Warrant the following living planting materials for a period of one year after date of Substantial Completion, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, abnormal weather conditions unusual for warranty period, or incidents that are beyond Contractor's control.

- 1. Grass.

1.9 LAWN MAINTENANCE

- A. Begin maintenance of lawns immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
 - 1. Seeded Lawns: 60 days after date of Substantial Completion.
 - a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established at that time, continue maintenance during next planting season.
- B. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn.
- C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawns uniformly moist to a depth of 4 inches.
 - 1. Water lawn at the minimum rate of 1 inch per week.
- D. Mow lawns as soon as there is enough top growth to cut with mower set at specified height for principal species planted. Repeat mowing as required to maintain specified height without cutting more than 40 percent of the grass height. Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet.
- E. Postfertilization: Apply fertilizer to lawn after first mowing and when grass is dry.

1. Use fertilizer that will provide actual nitrogen of at least 1 lb per 1000 sq. ft. of lawn area.

PART 2 - PRODUCTS

2.1 GRASS MATERIALS

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts' "Rules for Testing Seeds" for purity and germination tolerances.
 1. Seed Mixture: Provide seed of grass species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed as indicated on Schedules at the end of this Section.

2.2 TOPSOIL

- A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, 4 percent organic material minimum, free of stones 1 inch or larger in any dimension, and other extraneous materials harmful to plant growth.
 1. Topsoil Source: Reuse surface soil stockpiled on the site. Verify suitability of surface soil to produce topsoil meeting requirements and amend when necessary. Supplement with imported topsoil when quantities are insufficient. Clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.

2.3 SOIL AMENDMENTS

- A. Lime: ASTM C 602, Class T, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent, with a minimum 99 percent passing a No. 8 sieve and a minimum 75 percent passing a No. 60 sieve.
- B. Aluminum Sulfate: Commercial grade, unadulterated.
- C. Sand: Clean, washed, natural or manufactured sand, free of toxic materials.
- D. Perlite: Horticultural perlite, soil amendment grade.
- E. Peat Humus: Finely divided or granular texture, with a pH range of 6 to 7.5, composed of partially decomposed moss peat (other than sphagnum), peat humus, or reed-sedge peat.
- F. Sawdust or Ground-Bark Humus: Decomposed, nitrogen-treated, of uniform texture, free of chips, stones, sticks, soil, or toxic materials.
 1. When site treated, mix with at least 0.15 lb of ammonium nitrate or 0.25 lb of ammonium sulfate per cu. ft. of loose sawdust or ground bark.
- G. Manure: Well-rotted, unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

- H. Herbicides: EPA registered and approved, of type recommended by manufacturer.
- I. Water: Potable.

2.4 FERTILIZER

- A. Bonemeal: Commercial, raw, finely ground; minimum of 4 percent nitrogen and 20 percent phosphoric acid.
- B. Superphosphate: Commercial, phosphate mixture, soluble; minimum of 20 percent available phosphoric acid.
- C. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea-form, phosphorous, and potassium in the following composition:
 - 1. Composition: 1 lb per 1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
 - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.
- D. Slow-Release Fertilizer: Granular fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
 - 1. Composition: 10 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

2.5 MULCHES

- A. Organic Mulch: Organic mulch, free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:
 - 1. Type: Shredded hardwood.
 - 2. Type: Ground or shredded bark.
 - 3. Type: Pine straw.
 - 4. Type: Salt hay or threshed straw.
 - 5. Type: Wood and bark chips.
 - 6. Type: Pine needles.
 - 7. Type: Peanut, pecan, and cocoa-bean shells.
- B. Asphalt Emulsion Tackifier: Asphalt emulsion, ASTM D 977, Grade SS-1, nontoxic and free of plant growth- or germination-inhibitors.
- C. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application, nontoxic and free of plant growth- or germination-inhibitors.

2.6 WEED-CONTROL BARRIERS

- A. Sheet Polyethylene: Black, 0.006-inch minimum thickness.

- B. Nonwoven Fabric: Polypropylene or polyester fabric, 3 oz. per sq. yd. minimum.
- C. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz. per sq. yd.

2.7 EROSION-CONTROL MATERIALS

- A. Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.
- B. Fiber Mesh: Biodegradable twisted jute or spun-coir mesh, 0.92 lb per sq. yd. minimum, with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches long.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive landscaping for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PLANTING SOIL PREPARATION

- A. Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.
- B. Mix soil amendments and fertilizers with topsoil at rates indicated. Delay mixing fertilizer if planting does not follow placing of planting soil within a few days.
- C. For planting lawns, mix planting soil either prior to planting or apply on surface of topsoil and mix thoroughly before planting.
 - 1. Mix lime with dry soil prior to mixing fertilizer. Prevent lime from contacting roots of acid-tolerant plants.

3.3 LAWN PLANTING PREPARATION

- A. Limit subgrade preparation to areas that will be planted in the immediate future.
- B. Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous materials.
- C. Spread planting soil mixture to depth required to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen.
 - 1. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.

- D. Preparation of Unchanged Grades: Where lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare soil as follows:
 - 1. Where grass cannot be reconditioned, remove and dispose of existing grass, vegetation, and turf damaged during construction activities. Do not turn over into soil being prepared for lawns.
 - 2. Till surface soil to a depth of at least 6 inches. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches of soil. Trim high areas and fill in depressions. Till soil to a homogenous mixture of fine texture.
 - 3. Clean surface soil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.
 - 4. Remove waste material, including grass, vegetation, and turf, and legally dispose of it off the Owner's property.
- E. Grade lawn and grass areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future. Remove trash, debris, stones larger than 1-1/2 inches in any dimension, and other objects that may interfere with planting or maintenance operations.
- F. Moisten prepared lawn areas before planting when soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.
- G. Restore prepared areas if eroded or otherwise disturbed after fine grading and before planting.

3.4 MULCHING

- A. Mulch backfilled surfaces of pits, trenches, planted areas, and other areas indicated.
- B. Weed-Control Barriers: Install the following weed-control barriers according to manufacturer's recommendations, before mulching. Completely cover area to be mulched, lapping edges a minimum of 6 inches.
 - 1. Material and Seam Treatment: Sheet polyethylene with seams taped.
- C. Organic Mulch: Apply the following average thickness of organic mulch and finish level with adjacent finish grades. Do not place mulch against trunks or stems.
 - 1. Thickness: 2 inches.

3.5 SEEDING NEW LAWNS

- A. Sow seed with a spreader or a seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in 2 directions at right angles to each other.
 - 1. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.

- B. Sow seed per the drawings.
- C. Rake seed lightly into top 1/8 inch of topsoil, roll lightly, and water with fine spray.
- D. Protect seeded areas with slopes less than 1:6 against erosion by mechanically spreading straw mulch after completion of seeding operations. Spread uniformly at a minimum rate of 2 tons per acre to form a continuous blanket 1-1/2 inches loose depth over seeded areas. .
 - 1. Anchor straw mulch by crimping into topsoil by suitable mechanical equipment.

3.6 HYDROSEEDING NEW LAWNS

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.
 - 1. Mix slurry with nonasphaltic tackifier.

3.7 RECONDITIONING LAWNS

- A. Recondition existing lawn areas damaged by Contractor's operations, including storage of materials or equipment and movement of vehicles. Also recondition lawn areas where settlement or washouts occur or where minor regrading is required. Remove all ruts and other traces of activity and restore to a condition ready for grassing.
- B. Remove sod and vegetation from diseased or unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.
- C. Where substantial lawn remains, mow, dethatch, core aerate, and rake. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides.
- D. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of it off the Owner's property.
- E. Till stripped, bare, and compacted areas thoroughly to a depth of 6 inches.
- F. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches of soil. Provide new planting soil as required to fill low spots and meet new finish grades.
- G. Apply seed and protect with straw mulch as required for new lawns.
- H. Water newly planted areas and keep moist until new grass is established.

3.8 CLEANUP AND PROTECTION

- A. During landscaping, keep pavements clean and work area in an orderly condition.

- B. Protect landscaping from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.

3.10 SEED MIXTURES SCHEDULE

- A. Full-Sun Mixture: Provide certified grass-seed blends or mixes, proportioned by weight, as follows:

Proportion	Name	Min. Pct. Germ.	Min. Pct. Pure Sd.	Max. Pct. Weed Sd.
100 pct.	Bermudagrass (Cynodon dactylon)	80	85	0.50

- B. Sun and Partial Shade: Provide certified grass-seed blends or mixes, proportioned by weight, as follows:

Proportion	Name	Min. Pct. Germ.	Min. Pct. Pure Sd.	Max. Pct. Weed Sd.
50 pct.	Kentucky bluegrass (Poa pratensis)	80	85	0.50
30 pct.	Chewings red fescue (Festuca rubra variety)	85	98	0.50
10 pct.	Perennial rye grass (Lolium perenne)	90	98	0.50
10 pct.	Redtop (Agrostis alba)	85	92	1.00

- C. Heavy Shade: Provide certified grass-seed blends or mixes, proportioned by weight, as follows:

Proportion	Name	Min. Pct. Germ.	Min. Pct. Pure Sd.	Max. Pct. Weed Sd.
50 pct.	Chewings red fescue (Festuca rubra variety)	85	98	0.50
35 pct.	Rough bluegrass (Poa trivialis)	80	85	1.00
15 pct.	Redtop (Agrostis alba)	85	92	1.00

END OF SECTION 32 92 00

