VOLUME ONE

McKinley Middle Magnet School

BATON ROUGE, LOUISIANA

EAST BATON ROUGE PARISH SCHOOL BOARD MEMBERS:

CHAROLOTTE PLACIDE
INTERIM SUPERINTENDENT

INGRID KELLY
DISTRICT 1
WARREN L. PRATT
DISTRICT 2
DARRYL ROBINSON
DISTRICT 3
TARVARD SMITH
DISTRICT 4

ALFRED WILLIAMS
DISTRICT 5
PATRICIA HAYNES-SMITH
DISTRICT 6
NOEL HAMMATT
DISTRICT 7
ROGER MOSER
DISTRICT 8

JANET PACE
DISTRICT 9
JILL DYASON
DISTRICT 10
JAY DEVALL
DISTRICT 11
WILLIAM P. "BILL" BLACK
DISTRICT 12

PROGRAM MANAGER
CSRS / THE FACILITY GROUP
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BATON ROUGE, LOUISIANA 70805

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5131 PAYNE DRIVE
BATON ROUGE, LOUISIANA 70809
PHONE (225) 767-7841

CIVIL ENGINEER
ABMB ENGINEERS, INC.
9229 BLUEBONNET BLVD.
BATON ROUGE, LOUISIANA 70809
PHONE (225) 765-7400

MECHANICAL AND ELECTRICAL ENGINEERS
ASSAF, SIMONEAUX, TAUZIN AND ASSOCIATES
8417 KELWOOD AVENUE
BATON ROUGE, LOUISIANA 70806
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KITCHEN CONSULTANT
FUTCH DESIGN ASSOCIATES, INC.
8966 INTERLINE AVE, SUITE C
BATON ROUGE, LOUISIANA 70809
PHONE (225) 923-1289

ACOUSTICAL CONSULTANT
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8280 YMCA PLAZA DR., BLDG. 10B
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Architects
A.I.A.
3377 North Boulevard
Baton Rouge, Louisiana 70806
USA

OCTOBER 15, 2004

11/12/04 - FM AND CP REVISIONS

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SECTION 00020
ADVERTISEMENT FOR BIDS

Sealed bids are requested by East Baton Rouge Parish School Board from general contractors for construction of:

PROJECT NAME: **New School**
SCHOOL: **McKinley Middle School**
PROJECT NO.: **710.002**

Bids will be received at the **East Baton Rouge Parish School Board, Choctaw Administrative Center, Attn: CSRS/The Facility Group, 2875 Michelli Drive, Baton Rouge, Louisiana 70805** until:

2:00 p.m. LOCAL TIME, December 16, 2004

at which time and place the bids will be publicly opened and read aloud.

Complete Bid Documents prepared by Robert M. Coleman & Partners Architects may be obtained as follows:

1. Bidders may contact Letterman's Blue Print and Supply, Co. at 225-925-2663 to obtain complete sets of documents for a deposit as described below. (All General Contractors bidding on the project shall be required to issue deposit and receive at least one complete set of documents.)

   DOCUMENT DEPOSIT - Upon payment of a deposit of **$300** Cash or check for each set of documents, the deposit or a portion of the deposit is returnable as provided by the Louisiana Public Bid Laws.

2. Bid documents may be reviewed at the office of CSRS/The Facility Group, 2875 Michelli Dr., Baton Rouge, LA 70805, the East Baton Rouge Parish School System Plan Room, F. W. Dodge Plan Room, A.G.C. Builders Exchange and Construction Market Data.

3. Bidders may go to the following URL address through the Internet:
   http://mail.cparch.com/projects/mckinleybid
   and be able to view, download, and print documents as needed for no fee or deposit.

   NOTE: The Project Web Page mentioned above will function like a plan room. That is to say that all perspective bidders and suppliers are welcome to use the documents posted. However, it will remain the responsibility of bidders and vendors who use this Web Page to continually check the Web Page for the issuing of addenda and other bid information. Bidders, who place deposits with Letterman's to receive documents, will be sent all addenda. Bidders who only use the Web Page will not be sent any addenda. When using the Web Page, it is necessary to check the Web Page for any addenda. The Owner does not warrant the accuracy nor the completeness of the Bid Documents on the Project Web Page.

Bids must be accompanied by a bid security equal to 5 percent of the base bid and all additive alternates in the form of a certified check, cashier's check, or bid bond.

A PRE-BID CONFERENCE will be held at: CSRS/The Facility Group, 2875 Michelli Drive, Baton Rouge, Louisiana 70805, on December 2, 2004 at 10:00 am. Attendance at this Pre-Bid Conference is Mandatory in order to submit a bid.

Contract, if awarded, will be on the basis stated in the Instructions to Bidders. No bid may be withdrawn for a period of 45 days after bid opening, except as provided by law.

Bidders must meet the requirements of the State of Louisiana Contractors' Licensing Law, R.S. 37:2151 et seq.

East Baton Rouge Parish School Board reserves the right to award the project on whatever basis is in the interest of the Owner and to accept or reject any or all bids and to waive technicalities and informalities.

Roger Moser, President
East Baton Rouge Parish School Board

Charlotte Placide, Interim Superintendent
East Baton Rouge Parish School System

DATE: November 15, 2004
Legal Ad to Run:
11/18/04,11/23/04, 11/30/04

END OF SECTION

SECTION 00101
INSTRUCTIONS TO BIDDERS

1. Introduction: In order to be entitled for consideration, bids must be made in accordance with the Advertisement for Bids and as required on the Bid Form. An abstract of the bids may be available to bidders. The Owner reserves the right to the extent allowed by law to reject any or all bids and to waive technicalities and informalities. See Advertisement for Bids, 00020, for bid date, time, and location for submittal of bids.

2. The Owner of the proposed work is:

   East Baton Rouge Parish School Board

3. The title of the Work will be as indicated in the Advertisement for Bids.

4. Architects and Engineers: The Architect of record or his authorized representative, and the consulting engineer(s) whose seal(s) appear on the Construction Documents will administer the construction contract.

5. Bids:

   A Sealed bids are requested to be filled in by typewriter or manually in ink and submitted in a Bid Form attached to the Bidding Documents, Section 00310 or on extra copies available from the Architect. All blanks on the Bid Form prior to the signature line must be filled in except for Section 8, which is to be completed by a nonresident bidder. Submit the Bid Form and attachments in a sealed opaque envelope addressed to the **East Baton Rouge Parish School Board, Physical Plant Services, Attn: CSRS/The Facility Group at 2875 Michelli Drive, Baton Rouge, Louisiana, 70805**, plainly marked with the name of the project as shown in the Advertisement for Bids and with the date the bids are to be opened. **Also, on the envelope include the bidder's name, address and Louisiana Contractor's license number.** Failure to show the contractor's license number on the bid envelope shall result in the bid being automatically rejected and returned to the bidder. If the bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "BID ENCLOSED" on the face of the envelope. Enclose in the envelope the other documents listed on the Bid Form.

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

   C. Bidders shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

   D. Bids received after the time and date for receipt of Bids will be returned unopened.

6. Documents: Bidding Documents may be obtained from the office designated in the Advertisement for Bids. Bidding Documents may be examined in the office of the Architect, the office of CSRS/The Facility Group, 2875 Michelli Drive Baton Rouge, La. 70805 (The Owner's Representative) and reviewed at F.W. Dodge and A.G.C. Builders Exchange Plan Room. Bidding Documents will be issued as allowed by the provisions of Louisiana R.S. 37:2163B.

7. Addenda: Addenda will be transmitted to all known bidders to have received a complete set of Bidding Documents. In the event any addendum modifying plans and specifications are issued within a period of seven days prior to the advertised time, or the time extended for opening bids, excluding Saturdays, Sundays and any legal holidays, then such addenda shall be transmitted by a copy of the addendum to all prime bidders who have previously requested and received bid documents by one of the following methods: (1) facsimile transmission; (2) e-mail; or (3) hand-delivery. Such transmission shall be completed within twenty-four hours of the issuance of the addendum. In addition, copy of the addendum shall be sent by regular mail to all prime bidders who have requested bid documents.

8. Interpretation:

A. No oral interpretations will be made to bidders as to the meaning of Bidding Documents. Bidders and sub-bidders requests for such interpretations shall be made in writing to the Architect no later than seven (7) working days prior to date and time for receiving bids and failure on the part of the successful bidder to do so shall not relieve him, as a contractor, of the obligation to execute such work in accordance with a later interpretation by the Architect. All the interpretations made to the bidders shall be made in the form of addenda to the Drawings and Project Manual and sent to all bidders known to have received a complete set of Bidding Documents.

B. Bidders shall promptly notify the Architect of any ambiguity, inconsistency or error that they may discover upon examination of Bidding Documents or the site and local conditions.

C. No substitutions of the materials, products, and equipment described in the Bidding Documents will be considered unless written request for approval has been submitted by a bidder and has been received by the architect at least seven (7) working days prior to the date for a receipt of bids. Any approval of any proposed substitutions shall be set forth in an addendum.

D. No addenda will be issued later than 72 hours prior to the date for the receipt of bids excluding Saturdays, Sundays and any legal holiday, except an addendum, if necessary, postponing the date of the receipt of the bids or withdrawing the request for bids. If it is necessary to issue an addendum within 72 hours prior to the receipt of the bids, then the bid opening shall be extended for at least seven (7) days but not to exceed 21 days without re-advertising or as otherwise provided by law. The addendum shall state the revised time and date for the opening of bids.

E. Each bidder shall ascertain from the Architect prior to submitting a bid that he has received all addenda issued. Failure of a bidder to receive an addendum or to consider one or more addenda shall not relieve the bidder from any obligation under his bid as submitted. All bids will be considered by the Owner as if the bidder had received and considered all addenda. A bidder acknowledges receipt of all addenda by submission of a Bid Form.

F. Sums on the Bid Form Shall be expressed in figures and words.

G. Alternates may be requested and the amounts stated 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. If alternates are requested, Bidders are requested to complete the blanks for the alternate to include a specific sum or enter “No Change” if there is no change in the Base Bid Price.

H. For a multiple site Project, each bidder is requested to complete the supplement information sheet to describe and breakdown the base bid and alternates, if any, by each location or school site included in the Project. The completion of the information sheet is for information only and is not considered for the purposes of the contract award.

I. Allowances in proposals, if any, are restricted to minor items and limited to hardware, face brick, landscaping, electric light fixtures and carpeting. (LA-R.S. 38:2212 A. (3) (f).

9. Bond Requirements

   A. A bid bond (A.I.A. Document A310) or similar form, a certified check, or cashier's check payable to the East Baton Rouge Parish School Board in the amount equal to 5% of the bid price with all additive alternates, must be submitted with the Bid Form.

   B. A Performance Bond and a Labor and Materials Payment Bond satisfactory to the Owner each in the amount of 100% of the contract sum will be required of successful bidder to guarantee delivery of completed work under contract and payment for labor and materials. **These bonds shall be written only on the Owner's forms, copies of which are attached. No company, regardless of size or financial rating, will be allowed to write its own bonds.**

   C. Bid Bond, Performance Bond, and Labor and Material Payment Bond must be accompanied by a Certificate of Power of Attorney showing that the party who executed the bonds is authorized to do so by the surety company.

10. Contract Award:

   A. East Baton Rouge Parish School Board will act within forty-five (45) days of the receipt of bids and reserves the right to award the project on whatever basis is in the interest of the Owner and to accept or reject as provided by law any or all bids and to waive technicalities and informalities. If awarded, the Contract will be let to the lowest responsible and responsive bidder whose base bid is within the project budget and is able to furnish satisfactory surety company bonds. Alternates, If accepted, will be accepted in the order in which they are listed on the Bid Form. Determination of the low bidder will be on the basis of the sum of the Base Bid and any alternates accepted. Bid Forms which contain irregularities or qualifications of any kind or which do not comply with the Contract Documents are subject to being rejected and returned to the bidder without having been read and entered in the bid tabulation.

   B. Bid Forms not accompanied by the required bid security and an executed, non-collusion affidavit are incomplete and will be rejected.

11. Contract Form: The form of Agreement will be AIA Document A101, 1997 edition, Standard Form of Agreement Between Owner and Contractor, where the Basis of Payment is a Stipulated Sum. The agreement form will be prepared by the Owner and together with the bond forms issued to the Contractor for execution and return to the Owner for signature. The Contractor must submit executed bonds and insurance certificates to the Owner within ten (10) days of the date of the Notice of Award.

12. Samples: If required by the Owner, the successful bidder will submit samples of items they propose to furnish before any award is made.

13. Pre-bid conference: A pre-bid conference will be held at a date approximately two weeks prior to opening of bids and at a location to be announced to all bidders of record. If the Advertisement for Bids indicates that a pre-bid conference is mandatory, then only those bidders attending the pre-bid conference may submit a bid.

14. Representation: Each bidder by submitting a completed and signed bid represents that:

   A. He has read and understands the Bidding Documents and proposed Contract Documents and his bid is made to the extent that such documentation relates to the work for which the bid is submitted.

   B. He has examined and personally visited the site and the location of the proposed work and has familiarized himself with the local conditions under which the work is to be

performed to include correlation of his personal observations with the requirements of the proposed Contract Documents.

C. His bid is based upon the materials, systems and equipment described in the Bidding Documents without exceptions.

D. He is satisfied as to (1) the conditions to be encountered, (2) the character, quality and scope of the proposed work, (3) the quality and quantity of the materials to be furnished, and (4) the requirements of the bid, the plans and specifications, and other proposed Contract Documents.

E. The bidder certifies that by completing the Bid Form he is fully qualified and licensed in accordance with Louisiana Revised Statutes 37:2150, et seq., and applicable local licensing law. He shall be responsible to determine that all sub-bidders or prospective subcontractors are duly licensed in accordance with law.

15. Noncollusion Affidavit: Bidders shall attach or enclose with the signed Bid Form an affidavit executed before a Notary Public in the form provided to the effect that he has not colluded with any person, firm or corporation with regard to any bid submitted.

16. Relief From Mistake in Bid: Prior to the time and date designated for receipt of bids, a submitted bid may be modified or withdrawn. Withdrawn bids may be resubmitted up to the date and time designated for the receipt of bids. Bids remain valid for forty-five (45) calendar days after the date of opening of the bids and may not be modified, withdrawn or canceled by the Bidder except for as allowed by law. Bidders are advised to review the provisions of La.R.S. 38:2214 to support a request to withdraw a bid, particularly the provision that a bidder claiming a mistake or error must give the public entity clear and convincing sworn, written evidence of the alleged error or mistake with 48 hours of the bid opening excluding Saturdays, Sundays and legal holidays.

17. Completion Time and Liquidated Damages: The completion of the work must be within the time stated on the Bid Form, subject to any extensions as may be granted in accordance with the Contract Documents or the contractor shall pay the Liquidated Damages in the amount as stated on the Bid Form. **The Contract Time shall commence ten (10) days from the date of the Notice of Award or as established in a Notice to Proceed with the Work at the Project site, whichever occurs first.**

END OF SECTION

General Conditions of the Contract for Construction

AIA Document A201 - 1997
1997 Edition - Electronic Format

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification. AUTHENTICATION OF THIS ELECTRONICALLY DRAFTED AIA DOCUMENT MAY BE MADE BY USING AIA DOCUMENT D401.

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ARTICLE 1 GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Agreement between Owner 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,~~T ~~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 together with the performance bond and the payment bond, if any, 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 Owner and a Subcontractor or Sub-subcontractor, (3) between the Owner, the Program Manager, and Architect or (4) between any other persons or entities other than the Owner 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.

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 described in the Contract of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner 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.

1.1.7 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.

Insert A: **1.1.8 THE CORRECTION PERIOD**
Insert B: The period of time described in Paragraph 12.2, which results in the requirement for the Contractor to correct all failures or defects in the Work rejected by the Architect or determined by the Architect as failing to conform to the requirements of the Contract Documents.

Insert C: **1.1.9 APPROVED**
Insert D: When the words "approved", "satisfactory", or "proper" are used, approval by the Architect shall be understood.

Insert E: **1.1.10 THE PROGRAM MANAGER**
Insert F: The Owner has retained the services of CSRS/The Facility Group as its Program Manager. The Program Manager is the Owner's Representative for all matters except for adjustments in the Contract Sum or Contract Time. The

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Owner designates its Director of Physical Plant Services to act on its behalf involving matters of the Contract Sum or Contract Time.

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 are to be read as a whole: 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 a discrepancy in the Contract Documents, the more specific and more detailed descriptive information will take precedence over the general and less detailed description. In case of doubt, Contractor shall assume that Owner intends that the more complete method, system, or process is required. Any work, labor, materials or equipment which may reasonably be inferred from the Contract Documents as being required to produce a functionally complete Project or part thereof, will be supplied by the Contractor whether or not specifically stated in the Contract Documents. Reference to standard specifications, manuals, or codes of any technical society, organization, or association or to the laws or regulations of any governmental authority, whether such reference is specific or by implication shall mean the latest standard specification, manual, code or laws or regulations in effect at the time of opening of Bids (or the date of the Contract if no advertised bids), unless otherwise specifically stated. However, no provision of any standard specification, manual, or code shall be effective to change the duties and responsibilities of the Owner, Contractor or Architect or any of their consultants, agents or employees from those set forth in the Contract Documents.

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.

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.

Insert G: **1.2.4** Various sections of the Specifications identify related work specified elsewhere. Such listings are to serve solely as guidelines and are NOT to be construed as the only areas of related work, or otherwise limit the duties of the Contract as set forth in Paragraph 1.2.3.

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 published by the American Institute of Architects.

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 Contract Documents shall be signed by the Owner and Contractor. If either the Owner or Contractor or both do not sign all the Contract Documents, the Architect shall identify such unsigned Documents upon request. Contractor, at his expense, shall record a complete duplicate original with all pages of the Contract and each of the Bonds with the Clerk of Court for the Parish of East Baton Rouge prior to commencing the Work and shall furnish to the Owner and Architect the date of recording together with the instrument number where recorded.

1.5.2 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become ~~generally~~ familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents, which the Contractor thoroughly understands their intent and purpose. The Owner assumes no responsibility or liability for the physical condition or safety of the Project site or any improvements located on the site. The Contractor is solely responsible for providing a safe place for the performance of the Work.

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

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Architect's consultants describe the Work to be executed by the Contractor. ~~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 such Drawings, Specifications and other Documents ~~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 Owner, 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.

ARTICLE 2 OWNER

2.1 GENERAL

2.1.1 The Owner 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 Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Subparagraph 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

2.1.2 ~~The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.~~

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 ~~The Owner shall, at the written request of the Contractor, prior to commencement of the Work and thereafter, furnish to the Contractor reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. Furnishing of such evidence shall be a condition precedent to commencement or continuation of the Work. After such evidence has been furnished, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.~~

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 Owner through its Program Manager shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities. The Owner will pay the Sewer Impact fees, Water Tap fees and Water Meter fees for work performed by the Baton Rouge Water Company.

2.2.3 The Owner through its Program Manager shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work. The Contractor shall confirm the location of each utility. The Contractor shall undertake to make such further investigations, including, without limitation, all structural, surface and subsurface conditions including soil borings and otherwise of the site of the Project.

2.2.4 Information or services required of the Owner by the Contract Documents shall be furnished by the Owner with

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reasonable promptness. Any other information or services which are under the Owner's control and which are necessary ~~relevant~~ to the Contractor's performance of the Work under the Owner's control shall be furnished by the Owner after receipt from the Contractor of a written request to the Architect for such information or services.

2.2.5 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, ~~such copies~~ 10 sets of Drawings and Project Manuals; additional sets at cost of reproduction. ~~as are reasonably necessary for execution of the Work.~~

2.3 OWNER'S RIGHT TO STOP THE WORK

2.3.1 If the Contractor fails to correct Work or a portion of the Work or the Work at one or more sites in a multiple site Project, which is not in accordance with the requirements of the Contract Documents as required by Paragraph 12.2, ~~or persistently~~ or fails to carry out Work in accordance with the Contract Documents, or fails or refuses to provide a sufficient amount of properly supervised and coordinated labor, materials, or equipment so as to complete the Work within the Contract Time, the Owner 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 Owner to stop the Work shall not give rise to a duty on the part of the Owner 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~~. Stoppage of the Work by Owner pursuant to this subparagraph shall not result in a claim by Contractor for delay or for an extension of the Contract Time.

2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

2.4.1 If the Contractor defaults or neglects to carry out the Work or a portion of the Work or the Work at one or more sites in a multiple site Project in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the Owner, to commence and continue correction of such default or-neglect with diligence and promptness, ~~the Owner may after such seven-day period give the Contractor a second written notice to correct such deficiencies within a three-day period. If the Contractor within such three-day period after receipt of such second notice fails to commence and continue to correct any deficiencies,~~ the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services and expenses made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner within seven (7) days following written demand from the Owner.

Insert H: **2.5 OWNER'S REPRESENTATIVE**

Insert I: **2.5.1** The Owner has retained a Program Manager. The Architect or Engineer or other professional retained by the Owner to design the Project, has the responsibility to administer the Contract for Construction, including inspection by himself and his consultants. No responsibilities for services contracted to the Architect, Engineer, or Contractor shall be shared by the Owner's Program Manager.

Insert J: **2.6 OWNER'S RIGHT TO AUDIT**

Insert K: **2.6.1** The Contractor shall keep full and accurate records of all costs incurred and items invoiced in connection with the Work, which records shall be open to audit by the Owner or its authorized representatives during performance of the Work and until three years after Final Payment.

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 re__presentative.

3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

3.1.3 The Contractor shall not be relieved of its 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.

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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 Owner 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~~ Any 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 and the Owner' Program Manager as a request for information (RFI) in such form as the Architect may require.

3.2.2 Any design errors or omissions noted by the Contractor during this review shall be reported promptly to the Architect and the Owner's Program Manager in writing, 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~~ While 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 and the Owner's Program Manager in writing.

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 Owner as would have been avoided if the Contractor had performed such obligations. The Contractor shall not be liable to the Owner 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 or in the exercise of ordinary care, reasonably should have recognized such error, inconsistency, omission or difference and ~~knowingly~~ failed to report it to the Architect and the Owner's Program Manager in writing.

Insert L: **3.2.4** Building materials to be incorporated into the Work shall either be certified, in writing, by the manufacturer to be asbestos free or be inspected and tested by accredited testing laboratories and certified to be free of asbestos content in accordance applicable federal standards, including but not limited to the Asbestos Hazard Emergency Response Act (AHERA) and the Toxic Substances Control Act (TSCA). "Asbestos" means the Asbestiform varieties of: Chrysotile (Serpentine), Crocidolite (Riebecrite), Ammosite (Cummingtonitegrunerite), Anthophyllite, Tremolite and Actinolite. Copies of test reports shall be furnished to the Architect and Owner. Materials discovered to contain asbestos shall be removed immediately at the Contractor's sole expense using current standards of the Louisiana Department of Environment Quality (DEQ).

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. ~~, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite 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 Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any resulting loss or damage~~.

Insert M: **3.3.1.1** The Contractor shall establish the building grades, lines, levels, column, wall and partition lines required by the various subcontractors in laying out their work.

3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor, the Contractor's employees,

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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. In the event the Owner or the Architect notify the Contractor of any such acts or omissions, Contractor shall immediately cure such acts or omissions or results thereof.

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.

3.4 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.

3.4.2 The Contractor may make substitutions of materials or equipment specified in the Contract Documents only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order. If, after execution of the Contract, the Contractor desires to submit an alternate product in lieu of what has been specified or shown in the Contract Documents, the Contractor may do so, in writing, setting forth the following: (1) reasons the substitution is necessary; (2) supporting data including technical information to allow for evaluation of the substitute; (3) warranty information. Substitutions may be rejected by the Architect without explanation. Failure to schedule the ordering of any item is not a valid reason to support a request for a substitute.

3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and all other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them and shall immediately remove from the Work any unfit person or persons not skilled in the tasks assigned to them. All employees and all other persons carrying out the Contract shall wear appropriate identification on their shirt at all times when on the Project site.

3.5 WARRANTY

3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality 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. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective and must be removed immediately at Contractor's expense upon notification by Owner or Architect and the Work replaced and completed in accordance with the requirements of the Contract Documents. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect or the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. The Contractor's warranty includes any and all warranties provided by law.

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.

3.7 PERMITS, FEES AND NOTICES

3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required when bids are received or negotiations concluded.

3.7.2 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and lawful orders of public authorities applicable to performance of the Work.

3.7.3 ~~It~~ While it is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with

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applicable laws, statutes, ordinances, building codes, and rules and regulations. ~~However,~~ if the Contractor observes that portions of the Contract Documents are at variance therewith, the Contractor shall promptly notify the Architect and Owner 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 Owner, the Contractor shall assume ~~appropriate~~ responsibility for correction of 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 Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

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 (1) the difference between actual costs and the allowances under Clause 3.8.2.1 and (2) changes in Contractor's costs under Clause 3.8.2.2.

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

3.9 SUPERINTENDENT

3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner'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.

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.

3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner's Program Manager and Architect. The Contractor shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with the Owner.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

3.11.1 The Contractor shall maintain at the site for the Owner 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 Owner upon completion of the Work before final payment is made.

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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, 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 Owner 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. When requested by the Architect, the Contractor shall also prepare coordination drawings setting forth the detailed manner and location in which various components of the Work are to be installed, which such drawings shall be treated as additional shop drawings.

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 with the prior approval of the Owner's Program Manager 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 certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner 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, whose signature and seal shall appear on all drawings, calculations, specifications,

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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 Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. 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.

3.13 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 Contractor inspected the site prior to award and accepted the areas for parking, storage and lay down of materials, and access to the site and the Owner will not be required to alter or interrupt any other operations going on at the Project site.

Insert N: **3.13.2** The Contractor shall take all precautions necessary to prevent loss or damage caused by vandalism, theft, burglary, pilferage, or unexplained disappearance of property of the Owner, whether or not forming part of the Work, located in the areas of the Project in which the Contractor has access. The Contractor shall provide for the security of the Owner's property to prevent any such loss, damage or injury, except as may be directly caused by agents or employees of the Owner.

Insert O: **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 Owner.

Insert P: **3.13.4** Without the prior written approval of the Owner, the Contractor shall not permit any workers to use any existing facilities (lavatories, toilets, entrances and similar items) at the Project site other than those designated in the Contract Documents.

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 Owner 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 Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner 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.

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

3.16 ACCESS TO WORK

3.16.1 The Contractor shall provide the Owner, the Owner's Program Manager 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 Owner 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

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required by the Contract Documents or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner 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 belief ~~information~~ is promptly furnished in writing to the Architect and the Owner's Program Manager.

3.18 INDEMNIFICATION

3.18.1 To the fullest extent permitted by law and to the extent claims, damages, losses or expenses are not covered ~~by Project Management Protective Liability~~ insurance purchased by the Contractor in accordance with Paragraph 11.1 ~~11.3~~, the Contractor shall indemnify and hold harmless the Owner, the Owner's Program Manager, 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), but only to the extent caused 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.

Insert Q: **3.19 FAILURE TO PERFORM WORK**

Insert R: 3.19.1 The Contractor shall be liable to the Owner for all costs or damages, which the Owner incurs as a result of Contractor's failure to perform the Work, or any part thereof, in accordance with the Contract Documents. Contractor's failure to perform shall include, but not be limited to, the failure of its subcontractors and /or suppliers of any tier to perform. The Contractor's liability to Owner shall include, but not be limited to, (1) the increased costs of performance, including services of the Architect and other consultants resulting from the Contractor's failure to comply with the Contract Documents; (2) costs of corrective or warranty work; (3) liability to third parties; (4) reprocurement costs; (5) attorney fees and related costs, including costs incurred in enforcing Owner's rights under the Contract Documents; and (6) liquidated damages.

Insert S: **3.20 LIENS**

Insert T: **3.20.1** In the event a lien is filed by anyone in relation to the Work, the Owner shall have the right (1) to require the Contractor to furnish to the Owner a release of lien or claim recorded by the person or entity filing the lien; (2) to require Contractor to discharge the lien by posting a bond with the Clerk of Court for the Parish of East Baton Rouge within five calendar days of notice by the Owner to the Contractor; and/or (3) to retain out of any payment due or thereafter to become due, an amount sufficient to indemnify the Owner against any lien or claims of lien, including bond premiums and attorney fees and to apply the same in such manner as Owner deems necessary to protection and/or satisfy such claims and liens. In the event such lien is not discharged. The Owner may require the Contractor at its sole cost and expense, including attorney fees, to hold harmless and defend the Owner of and from any and all claims, lawsuits, causes of action, and demands of any person or entity asserting or claiming any right as a result of any lien or claim, recorded or unrecorded against the Contract Funds or the Owner's property. The Owner shall have the right to terminate the Contractor for default or to bond off said lien(s) and recover from Contractor all costs incurred as a result thereof, including, but not limited to, bond premiums and attorney fees. Prior to receipt of partial or final payment, as appropriate, Contactor shall provide Owner a partial or final release of its liens and claims and partial or final releases of all liens and claims of all persons furnishing labor and/or materials to the Work with satisfactory evidence that there are no other liens or claims whatsoever outstanding against the Work.This subparagraph shall not apply if the Owner is not current in payment of properly certified pay applications.

Insert U: **3.21 WORK RELATING TO EXISTING FACILITIES**

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Insert V: 3.21.1 The Contractor shall not perform work in existing buildings which will interfere with normal school operations, teaching, or normal traffic flow or produce excessive noise without twenty-four (24) hours written notice to the Owner's Program Manager and then only with their concurrence. Security of the Owner's property may require the services of a guard during nights or weekends if required by the nature of the work at no additional cost to the Owner.

Insert W: **3.21.2** All means of access shall be maintained at all times during school occupancy to comply with exit requirements in the NFPA 101 Life Safety Code.

Insert X: 3.21.3 The Contractor shall not allow his traffic or operations to encumber school vehicular or pedestrian traffic during school hours to include before school and after school programs. Space for parking of Contractor's personnel is designated in the Contract Documents.

Insert Y: 3.21.4 Any work required of the Contractor before the opening of school after summer vacation caused by failure of Contractor to meet its contract completion date will be performed as stated above at no additional expense to the Owner. This includes overtime work after normal school hours, during normal work days and on weekends, when required to accomplish the work necessary to maintain the construction schedule. This provision does not prohibit operations during normal work hours when prior arrangements been completed.

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.~~

Insert Z: The term Architect, when used in the Contract Documents, shall mean the prime Designer (Architect, Engineer or Landscape Architect), or his authorized representative, lawfully licensed to practice architecture, engineering or landscape architecture in the State of Louisiana, identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number.

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 Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

4.1.3 If the employment of the Architect is terminated, the Owner 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 an Owner's representative (1) during construction, (2) until final payment is due and (3) with the Owner's concurrence, from time to time during the one-year period for correction of Work described in Paragraph 12.2. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified in writing in accordance with other provisions of the Contract.

4.2.2 The Architect, as a representative of the Owner, will visit the site at intervals appropriate to the stage of the Contractor's operations (1) to become generally familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed, (2) to endeavor to guard the Owner against defects and deficiencies in the Work, and (3) to determine in general if the Work is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. 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.

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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 Owner, the Owner's Program Manager and Contractor shall endeavor to 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 Owner's Program Manager.

4.2.5 Based on the Architect's evaluations of the Work as provided in Subparagraph 4.2.2 and the data comprising 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 or a portion of the Work or the Work at one or more sites of a multiple site Project 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 or the Owner 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 Owner, Contractor or separate contractors, while allowing sufficient time in the Architect's professional judgment to permit adequate review. 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 with the prior approval of the Owner's Program Manager 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 Owner, for the Owner'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.

4.2.10 If the Owner 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, if any, shall be as set forth in an exhibit to be incorporated in the Contract Documents.

4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. 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 15 days after written request is made for

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them.

4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of 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 Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions so rendered in good faith.

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

4.3 CLAIMS AND DISPUTES

4.3.1 Definition. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation 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 and matters in question between the Owner and Contractor arising out of or relating to the Contract. Claims must be initiated by written notice. The responsibility to substantiate Claims shall rest with the party making the Claim. Claims shall be initiated by written notice and shall be expressly stated to be a claim under Paragraph 4.3.

4.3.2 Time Limits on Claims. Claims by either party must be initiated within 15 ~~21~~ days after occurrence of the event giving rise to such Claim, or within any time period designated elsewhere in these General Conditions such as for weather conditions or concealed conditions. ~~or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.~~ Claims must be initiated by written notice to the Architect, the Owner's Program Manager and the other party. A claim for additional time due to adverse weather conditions at the Project site must be initiated not later than the fifteenth (15th) day of the month following the month in which the adverse weather at the Project site had an effect on the scheduled construction or the Contractor failing to make such claim waives any such claim for additional time for the previous month.

4.3.3 Continuing Contract Performance. Pending final resolution of a Claim 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 Owner 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 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 promptly before conditions are disturbed and in no event later than ~~21~~ 10 days 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 Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within ~~21~~ 15 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 Owner and Contractor cannot agree that the conditions are materially different or cannot agree on an adjustment in the Contract Sum or Contract Time, the matter shall be ~~adjustment shall be referred to the Architect for initial determination~~, subject to further proceedings pursuant to Paragraph 4.4.

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. Such notice shall include, to the extent then known by Contractor, full details and substantiating data to permit evaluation by the Owner and the Architect. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Paragraph 10.6.

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 Owner 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 Owner, (5) termination of the Contract by the Owner, (6) Owner's suspension or (7) other reasonable grounds, Claim shall be filed in accordance with this Paragraph 4.3. Failure

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to file any such claim in accordance with Paragraph 4.3 shall constitute a waiver thereof.

4.3.7 Claims for Additional Time

4.3.7.1 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 an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay only one Claim is necessary.

4.3.7.2 If adverse weather conditions at the Project site including unsuitable ground conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions at the Project site were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction. The normal adverse weather conditions are specified below and no claim for additional time will be allowed for such number of days. An increase in the Contract Time due to weather shall not be cause for an increase in the Contract Sum..

Insert AA: **4.3.7.2** The following are assumed to be reasonably anticipated days of adverse weather (.01 inches or more of precipitation in Baton Rouge, Louisiana) on a monthly basis for which no additional time shall be allowed:

Insert AB:	January	10 days	May	8 days	September	9 days
Insert AC:	February	9 days	June	10 days	October	5 days
Insert AD:	March	8 days	July	13 days	November	8 days
Insert AE:	April	7 days	August	12 days	December	10 days

Insert AF: *Note: Contract is on a calendar day basis.*

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~~ 15 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

4.3.9 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

4.3.10 ~~**Claims for Consequential Damages.** The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes:~~

~~.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and~~

~~.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.~~

~~This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Subparagraph 4.3.10 shall be deemed to preclude an award of liquidated direct damages, when applicable, in accordance with the requirements of the Contract Documents.~~

4.4 RESOLUTION OF CLAIMS AND DISPUTES

4.4.1 Decision of Architect. Claims, including those alleging an error or omission by the Architect but excluding those arising under Paragraphs 10.3 through 10.5, shall be referred initially to the Architect for decision with a copy sent simultaneously to the Owner' Program Manager in the event of a claim by the Contractor. An initial decision by the Architect shall be required as a condition precedent to ~~mediation, arbitration or~~ litigation of all Claims between the Contractor and Owner arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Architect with no decision having been

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rendered by the Architect. The Architect will not decide disputes between the Contractor and persons or entities other than the Owner.

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 Owner to authorize retention of such persons at the Owner'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~~ or 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 take one of the last four numbered actions contemplated in Subparagraph 4.4.2, in writing, stating the reasons therefor. ~~either reject or approve the Claim in whole or in part~~.

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 approval or rejection of a Claim by the Architect shall be final and binding on the parties but subject to litigation. ~~mediation and arbitration.~~

4.4.6 ~~When a written decision of the Architect states that (1) the decision is final but subject to mediation and arbitration and (2) a demand for arbitration of a Claim covered by such decision must be made within 30 days after the date on which the party making the demand receives the final written decision, then failure to demand arbitration within said 30 days' period shall result in the Architect's decision becoming final and binding upon the Owner and Contractor. If the Architect renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence, but shall not supersede arbitration 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 Owner 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 Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

4.4.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines prior to resolution of the Claim. ~~by the Architect, by mediation or by arbitration~~.

4.5 MEDIATION

4.5.1 ~~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 4.3.10, 9.10.4 and 9.10.5 shall, after initial decision by the Architect or 30 days after submission of the Claim to the Architect, be subject to mediation as a condition precedent to arbitration or the institution of legal or equitable proceedings by either party.~~

4.5.2 ~~The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be in accordance with the Construction Industry Mediation Rules of the American Arbitration Association currently in effect. Request for mediation shall be filed in writing with the other party to the Contract and with the American Arbitration Association. The request may be made concurrently with the filing of a demand for arbitration but, in such event, mediation shall proceed in advance of arbitration or legal or equitable proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order.~~

4.5.3 ~~The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as~~

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~~settlement agreements in any court having jurisdiction thereof.~~

4.6 ARBITRATION

4.6.1 ~~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 4.3.10, 9.10.4 and 9.10.5, shall, after decision by the Architect or 30 days after submission of the Claim to the Architect, be subject to arbitration. Prior to arbitration, the parties shall endeavor to resolve disputes by mediation in accordance with the provisions of Paragraph 4.5.~~

4.6.2 ~~Claims not resolved by mediation shall be decided by arbitration which, unless the parties mutually agree otherwise, shall be in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association currently in effect. The demand for arbitration shall be filed in writing with the other party to the Contract and with the American Arbitration Association, and a copy shall be filed with the Architect.~~

4.6.3 ~~A demand for arbitration shall be made within the time limits specified in Subparagraphs 4.4.6 and 4.6.1 as applicable, and in other cases within a reasonable time after the Claim has arisen, and in no event shall it be made after the date when institution of legal or equitable proceedings based on such Claim would be barred by the applicable statute of limitations as determined pursuant to Paragraph 13.7.~~

4.6.4 ~~**Limitation on Consolidation or Joinder.** No arbitration arising out of or relating to the Contract shall include, by consolidation or joinder or in any other manner, the Architect, the Architect's employees or consultants, except by written consent containing specific reference to the Agreement and signed by the Architect, Owner, Contractor and any other person or entity sought to be joined. No arbitration shall include, by consolidation or joinder or in any other manner, parties other than the Owner, Contractor, a separate contractor as described in Article 6 and other persons substantially involved in a common question of fact or law whose presence is required if complete relief is to be accorded in arbitration. No person or entity other than the Owner, Contractor or a separate contractor as described in Article 6 shall be included as an original third party or additional third party to an arbitration whose interest or responsibility is insubstantial. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of a Claim not described therein or with a person or entity not named or described therein. The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.~~

4.6.5 ~~**Claims and Timely Assertion of Claims.** The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.~~

4.6.6 ~~**Judgment on Final Award.** The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.~~

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. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

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 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, ~~as soon as practicable after award of the Contract,~~ shall at the Pre-Construction Conference furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect will promptly reply to the Contractor in writing stating whether or not the Owner or the Architect, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the

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Owner or Architect to reply promptly shall constitute notice of no reasonable objection. No Contractor payments shall be made until the requested information is provided. As applicable based on the value of the Work, Subcontractors shall be duly licensed in accordance Louisiana Revised Statutes 37:2150, et seq.

5.2.2 ~~The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.~~ The Contractor shall be solely responsible for selection and performance of all subcontractors. The Contractor shall not be entitled to claims for additional time and/or an increase in the Contract Sum due to a problem with the performance or non-performance of a subcontractor.

5.2.3 ~~If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, 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 Owner or Architect makes reasonable objection to such substitute.~~ The Contractor shall notify the Owner when a subcontractor is to be changed and substituted with another subcontractor.

5.3 SUBCONTRACTUAL RELATIONS

5.3.1 By appropriate agreement, written where legally required for validity, 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 Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner 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, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, 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.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner provided that:

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Paragraph 14.2 and only for those subcontract agreements which the Owner accepts by notifying the Subcontractor and Contractor in writing; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

5.4.2 ~~Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.~~

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner'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

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of subrogation. ~~If the Contractor claims that delay or additional cost is involved because of such action by the Owner, 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 Owner-Contractor Agreement.

6.1.3 The Owner shall provide for coordination of the activities of the Owner'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 Owner in reviewing their construction schedules and performance requirements 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 Other until subsequently revised. The Contractor shall anticipate the work of the Owner or other contractors may delay, disrupt, or interfere with the Work and the progress schedule. Contractor shall do all cutting, fitting and patching of the Work required to make its several parts come together properly in a manner which will not endanger any work of others by cutting, excavating or otherwise altering their work without the written consent of the Owner and the other contractors.

6.1.4 ~~Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights which apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.~~ The Owner may furnish materials or equipment to the site to be incorporated into the Work. For any Owner furnished equipment or materials to be incorporated into the Work, the Contractor shall perform such tasks as are necessary to coordinate and install the Owner-furnished materials or equipment to make the Work functionally complete. If the Contractor contends that such Owner-furnished materials or equipment constitute an extra to the Work outside the requirements of the Contract Documents, the Contractor may request a change orders for the direct field costs incurred in installing such Owner-furnished materials or equipment, in accordance with the procedures set forth in Article 7.

6.2 MUTUAL RESPONSIBILITY

6.2.1 The Contractor shall afford the Owner 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.

6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner 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 Owner'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 Owner shall be reimbursed by the Contractor for costs incurred by the Owner which are payable to a separate contractor because of delays, improperly timed activities or defective construction of the Contractor. The Owner shall be responsible to the Contractor for costs incurred by the Contractor because 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 Owner or separate contractors as provided in Subparagraph 10.2.5.

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

6.3 OWNER'S RIGHT TO CLEAN UP

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

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ARTICLE 7 CHANGES IN THE WORK

7.1 GENERAL

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. A Request for Information (RFI) is not recognized as a change in the Contract Documents which involves the Contract Sum or the Contract Time.

7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may subject to the Owner's Program Manager prior approval 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.

7.2 CHANGE ORDERS

7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, 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.

7.2.2 Methods used in determining adjustments to the Contract Sum may include those listed in Subparagraph 7.3.3.

Insert AG: **7.2.3** A Change Order within the the scope of the Contract or if outside the scope of the Contract in an amount less than $100,000.00 may be negotiated or let out for public bid. If negotiated, the Architect shall request a cost proposal from the Contractor for all proposed changes in the Work consisting of additions, deletions, or revisions. The cost proposal must be fully itemized as to costs, including material quantities, material costs, taxes, insurance, employee benefits, other costs, profit and overhead. The Architect shall review all items on the proposal request and make a recommendation to the Owner's Program Manager. The Owner' s Program Manager will review and if in agreement with the Architect's recommendation, submit the proposed Change Order to the Owner's Director of Physical Plant Services for approval and authorization provided funds are available in the authorized budget for the Project. If there are insufficient budget funds or if the proposed Change Order exceeds 10% of the Contract Sum or $100,000. whichever is greater, approval is required by formal action of the East Baton Rouge Parish School Board. In such case, only after School Board approval may the Architect prepare a formal Change Order and direct the Contractor to proceed with the revisions.

7.3 CONSTRUCTION CHANGE DIRECTIVES

7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner 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. A Construction Change Directive may also be used to document the amount of liquidated damages or the additional fees for the Architect due to additional inspections.

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7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods but not to exceed a specified amount:

.1 mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

.2 unit prices stated in the Contract Documents or subsequently agreed upon;

.3 cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 as provided in Subparagraph 7.3.6.

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 and Owner' Program Manager, in writing, 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 any 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 on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, a reasonable allowance for overhead and profit in accordance with the schedule set forth in subparagraph 7.3.6.6 below. In such case, and also under Clause 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Subparagraph 7.3.6 shall be limited to the following:

.1 costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

.2 costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; ~~and~~

.5 additional costs of supervision and field office personnel directly attributable to the change; and.

Insert AH: .6 an allowance for overhead which is to include all pro-rated home office expenses for the Project and profits combined, included in the total cost to the Owner for the purposes of subparagraphs 7.2.1, 7.3.3 and 7.3.6, shall be based on the following schedule:

Insert AI: **.1** To the Contractor for work which is performed with its own forces, not to exceed 15 percent of its net additional cost.

Insert AJ: **.2** To a Subcontractor for work which he performs with his own forces not to exceed 15 percent of his net additional cost.

Insert AK: **.3** To the Contractor for work performed by his Subcontractor not to exceed 10 percent of the amount due the Subcontractor. These percentages shall be applied to the net additional cost as defined herein. If the net cost value of a change results in a credit from the Contractor or Subcontractor, the credit shall

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be the net cost without overhead or profit. Among the items to be considered as overhead are insurance, travel, supervision, superintendent, timekeepers, clerks, watchmen, small tools, incidental job burdens and general office expense, and all other items not included in the cost as defined in this article.

Insert AL: .4 Any other provisions in the Contract Documents to the contrary not withstanding, only demonstrable, direct, out-of-pocket cost plus percentages set forth herein shall be allowable for change order work performed concurrently with the Work unless the cost includes a claim for extension of time by ordering of the change.

Insert AM: .5 All Sub-Subcontractors are considered to have been established solely for the convenience of the General Contractor and its immediate Subcontractors. To this effect, allowable Subcontractor overhead and profit amount shall not be derived by compounding the established percentages upon themselves through their Sub-Subcontractors.

Insert AN: .6 Contractor shall not submit groups of partial Proposals relative to a singular item of Change. Requests for Time Extensions relative to a Change shall be identified in the Proposal.

Insert AO: .7 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials,and subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major costs are Subcontracts, they shall be itemized also. In no case will a change involving over $100.00 be approved without such itemization. Proposals shall be rounded off to the nearest whole dollar amounts.

Insert AP: .8 The Contractor shall sequentially number each of its cost change proposals and further identify each proposal as to cause for the change.

7.3.7 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

7.3.8 Pending final determination of the total cost of a Construction Change Directive to the Owner, amounts not in dispute for such changes in the Work shall be included in Applications for Payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs. 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 Owner 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 effective immediately and shall be recorded by preparation and execution of an appropriate Change Order.

Insert AQ: **7.3.10** Changes in the Work performed by the Contractor without the approval or consent of the Owner shall be performed at NO COST TO THE OWNER and without adjustment to the Contract Time.

Insert AR: **7.3.11** By executing the Change Order, the Contractor acknowledges that:

Insert AS: .1 The Owner bears no responsibility for the conditions resulting in the change to the scope of the Work;

Insert AT: .2 The Change Order is for the full and final amount of Contract Sum and Contract Time adjustments due the Contractor for all additional work related to the Change Order; and

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Insert AU: .3 Any stated extension of Contract Time is equitable in nature and the Contractor waives any further claims for any additional Contract Time or any additional Contract Sum for whatever reason and of whatever kind, whether direct or indirect cost, profit, overhead, or any other expense, for the work enumerated in the Change Order, and any and all such claims for an extension of Contract Time or additional Contract Sum are waived in their entirety.

7.4 MINOR CHANGES IN THE WORK

7.4.1 Subject to Owner's Program Manager prior approval the ~~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 Owner and Contractor. The Contractor shall carry out such written orders promptly.

Insert AV: **7.5 LOG OF CHANGES**

Insert AW: **7.5.1** The Contractor shall maintain a current log of all RFIs, Change Orders and Construction Change Directives at the Site of the Project and shall provide the Owner, the Owner's Program Manager, and Architect access to the same as requested.

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 Agreement.

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

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.

Insert AX: **8.2.1.1** Time is subject to such extensions as may be granted under Section 8.3. The Owner's operations will be be impacted and delayed if the Project is not substantially complete within the time set forth in the Contract Documents. The Contractor and the Contractor's Surety shall be liable for and shall pay to the Owner the sum stated in the Contract Documents as fixed, agreed and liquidated damages for each consecutive calendar day (Saturdays, Sundays, and holidays included) of delay until the Work is substantially complete or, as applicable, until the Work is finally complete. The Owner shall be paid the sum(s) stated in the Contract Documents for liquidated damages. Such Liquidated Damages shall be withheld by the Owner from the amounts due the Contractor for progress payments and deducted from the Contract Sum by a Construction Change Directive signed only by the Owner and the Architect.

8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner 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 Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance. ~~Unless the date of commencement is established by the Contract Documents or a notice to proceed given by the Owner, the Contractor shall notify the Owner in writing not less than five days or other agreed period before commencing the Work to permit the timely filing of mortgages, mechanic's liens and other security interests.~~

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

8.3 DELAYS AND EXTENSIONS OF TIME

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8.3.1 If the Contractor is materially delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner, 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 Owner pending mediation and arbitration~~, or by other causes which the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may ~~determine~~ recommend, subject to Owner's approval of a Change Order for the change in the Contract Time. If a claim for delay or an extension of time is not made within the limits of paragraph of 4.3, any such claim is waived by the Contractor.

8.3.2 Claims relating to time or for delay shall be made in accordance with applicable provisions of Paragraph 4.3.

8.3.3 ~~This Paragraph 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents~~.

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 Owner to the Contractor for performance of the Work under the Contract Documents.

9.2 SCHEDULE OF VALUES

9.2.1 ~~Before the first Application for Payment,~~ At the Pre-Construction Conference, 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 and Owner may require. If applicable, the cost of work for each section listed under each division, shall be given. The cost for each section shall include labor, materials, overhead and profit. The total of all items shall equal the total Contract Sum. For a multiple site or location contract, the Schedule of Values shall be allocated for each separate site or location. In addition, the Contractor shall list and identify all subcontractors, subsubcontractors and suppliers that are minority-owned businesses or women-owned businesses in the Schedule of Values. This schedule, unless objected to by the Architect or the Owner's Program Manager, shall be used as a basis for reviewing the Contractor's Applications for Payment.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 ~~At least ten days before the date established for each progress payment,~~ Monthly, by the fifth day of each month, the Contractor shall submit to the Architect an itemized Application for Payment for operations completed in accordance with the schedule of values for the value of labor and materials incorporated into the Work and of materials suitably stored at the site as of the last day of the preceding month less normal retainage of ten percent (10%) for a Project with a Contract Sum up to $500,000.00 or five percent (5%) for a Project with a Contract Sum exceeding $500,000.00. Such application shall be notarized, ~~if required,~~ and supported by such data substantiating the Contractor's right to payment as the Owner 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 normal retainage shall not be due the Contractor until after Substantial Completion and the expiration of the forty-five (45) day lien period with submission to the Architect of a clear lien certificate from the Clerk of Court for the Parish of East Baton Rouge and an Application for Payment.

9.3.1.1 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. Change Order and Construction Change Directive items shall be individually identified as separate line items in the Application for Payment.

9.3.1.2 Such applications may not include requests for payment 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~~.~~

9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment

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delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, 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 Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner'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.

9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner 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. With each Application for Payment the Contractor shall submit affidavits from the major Subcontractors and Suppliers affirming the prior payments to the Subcontractor or Supplier made by the Contractor and that the Subcontractor or Supplier has no claim except for the applicable retainage withheld from previous payments and the amount of the current payment request.

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 Owner 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 Owner 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 Owner, 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 Owner 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~~ will withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner 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 Owner 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 if any, for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, 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 Owner 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 in the amount of 125% of the claim or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;

.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;

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.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

.5 damage to the Owner 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;.

Insert AY: **.8** the value of the punch list; or

Insert AZ: **.9** rejection of any part of the Work by any governmental authority having jurisdiction over the Project.

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 and delivered to the Owner's Program Manager a Certificate for Payment, the Owner's Program Manager will review the Certificate for Payment and either (1) if found to be in proper order forward it for payment; or (2) if found to be erroneous in any respect (e.g. information format, amounts, percents or other similar items), review such errors with the Architect and either return the Certificate for Payment to the Architect for correction, recertification and reprocessing with the possible return to the Contractor, or hand correct the Certificate for Payment to reflect the necessary corrections upon the mutual agreement with the Architect. ~~the~~ Owner shall make payment within fifteen (15) days after the Program Manager's receipt of a valid Certificate for Payment ~~in the manner and within the time provided in the Contract Documents~~, and shall so notify the Architect. Erroneous Certificates for Payment may cause delays in processing for payment. Such delay shall not constitute cause for seeking claims or compensation for additional Contract Sum and/or Contract Time.

9.6.2 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, 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. Louisiana R.S. 9:2784 (A) and (C) requires a Contractor or Subcontractor to make payment due to each Subcontractor and supplier within fourteen (14) consecutive days of the receipt of payment from the Owner. If not paid, a penalty in the amount of 1/2 of 1% per day is due, up to a maximum of 15%, from the expiration date until paid. The contractor or subcontractor, whichever is applicable, is solely responsible for payment of a penalty.

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 Owner on account of portions of the Work done by such Subcontractor.

9.6.4 Neither the Owner 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 Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

9.6.7 ~~Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not~~

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~~commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.~~

9.7 FAILURE OF PAYMENT

9.7.1 ~~If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by arbitration, then the Contractor may, upon seven additional days' written notice to the Owner 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 shut-down, delay and start-up, plus interest as provided for in the Contract Documents.~~

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 that the Owner can occupy or utilize the Work for its intended use and when all required occupancy permits, if any, have been issued and copies of the same have been delivered to the Owner.

Insert BA: **9.8.1.1** The Work will not be considered suitable for Substantial Completion review until all Project systems included in the Work are operational as designed and scheduled; designated instruction of the Owner's personnel in the operation of the systems has been completed; and all finishes within the Contract Documents are in place. In general, the only remaining Work shall be minor in nature, so that the Owner could occupy the building on that date and the completion of the Work by the Contractor would not materially interfere with or hamper the normal business operations of the Owner. As a further condition of Substantial Completion acceptance, the Contractor shall certify that all remaining Work will be completed within thirty (30) consecutive calendar days or as agreed upon following the Date of Substantial Completion.

9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner 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.

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 Contract Documents so that the Owner 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. The Architect will make only two (2) such inspections to determine Substantial Completion. If these inspections determine that the Work is not substantially complete, either because of major items not completed or an excessive number of punch list items, successive inspections requested by the Contractor shall be charged to the Contractor at a rate of $400.00 per person per half day by means of a Construction Change Directive signed only by the Architect and the Owner..

Insert BB: **9.8.3.1** Upon receipt of the Contractor's list, a "punch list" of exceptions and the dollar value of each item will be prepared by the Architect. The monetary value assigned to this list will be 125% the estimated actual value of the items to be completed or corrected. No funds assigned for the punch list value shall be due the Contractor until all punch list items are completed and are accepted by the Architect. If the dollar value of the punch list less the retainage amount exceeds the remaining Contract Sum, then the Project shall not be accepted as substantially complete. If delivery of material or equipment, required as part of the punch list work, is beyond the control of the Contractor, the Contractor's completion time shall be extended and his surety so notified. Unless extended, if all punch list items have not been completed by the end of the thirty (30) days through no fault of the Architect or Owner, the Contractor shall pay to the Owner Liquidated Damages in the amount specified in the Contract Documents for each and every calendar day after the date that the date Final Completion of the Work is not met plus the expenses of the Architect as provided hereafter and the Owner may hold the

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Contractor in default. If the Owner finds the Contractor is in default, the Surety shall be notified. If within thirty (30) days after notification, the Surety has not completed the punch list, the Owner may, at its option, contract to have the balance of the work completed and pay for such work with the unpaid funds remaining in the Contract Sum. Finding the Contractor in default shall constitute a reason for disqualification of the Contractor from bidding on future contracts. If the Surety fails to complete the punch list within the stipulated time period, the Owner may not accept bonds submitted, in the future, by the surety. All of the services of the Architect to inspect and provide any administration of the Contract in accordance with the Contract Documents after the expiration of the time for the Contractor to complete the punch list shall be paid by the Contractor at a rate of $150.00 for each hour of service and deducted by the Owner from any remaining Contract funds by means of a Construction Change Directive signed by the Owner and the Architect, or if no funds remain paid directly by the Contractor or its surety.

9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion which shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time of thirty (30) consecutive calendar days or such other period 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 Substantial Completion.

9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon receipt by the Owner of the fully executed Certificate of Substantial Completion with an attached punch list, the Owner shall issue a Notice by Owner of Acceptance of Work. The Contractor shall record the Notice by Owner of Acceptance of Work with the Clerk of Court in the Parish of East Baton Rouge, Louisiana and provide the recording information to the Architect and Owner. Upon such acceptance and consent of surety, if any, the Owner shall make payment reflecting any adjustment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents or to reimburse the Owner for the extra services of the Architect associated with any additional inspections.

9.9 PARTIAL OCCUPANCY OR USE

9.9.1 ~~The Owner 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 by the insurer as required under Clause 11.4.1.5 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 Owner 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 Owner and Contractor or, if no agreement is reached, by decision of the Architect.~~

Insert BC: Partial Occupancy is the stage in the progress of the Work when a designated portion of the Work is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the designated portion of the Work for its intended use. The Owner may occupy or use any substantially completed portion of the Work so designated by separate agreement with the Contractor and authorized by public authorities having jurisdiction over the the Work. Such occupancy or use may commence provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, 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 the designated 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.

9.9.2 Immediately prior to such partial occupancy or use, the Owner, 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.

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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. If the Architect does not find the Work acceptable under the Contract Documents, the Architect shall make one additional inspection; if the Work is still not acceptable, the Architect, and each of the Architect's principal consultants, shall be paid $150.00 per hour for their time, for each additional inspection authorized by the Owner's Program Manager, to be withheld from the unpaid funds remaining in the Contract sum. The payment shall be made by the Owner and deducted from the Contract funds. If no funds remain the Contractor or its surety shall pay the amount. 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.

9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect in form and substance satisfactory to the Owner (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) 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 Owner, (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 Owner, 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 Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall promptly pay ~~refund~~ to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees. Upon receipt of all Project close-out documents and acceptance of final completion, the Owner will then authorize the issuance of the final payment.

9.10.3 At the discretion of the Owner, no progress payment will be made after payment for Substantial Completion until the final payment if ~~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 Owner 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 Owner 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; or

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

.4 any warranty provided by law.

Insert BD:

9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, a Sub-subcontractor, equipment or material supplier

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shall constitute a waiver of claims by that payee. ~~except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.~~

Insert BE: **9.11 LIQUIDATED DAMAGES**
Insert BF: **9.11.1** The Contractor and the Contractor's Surety, if any, agree and shall be liable for and pay to the Owner the sums stipulated in the Contract Documents as liquidated damages not by way of penalty. Any liquidated damages shall be deducted from the Contract Funds by a Construction Change Directive signed only by the Architect and Owner or if no funds remain to be paid by the Contractor or the Contractor's Surety.

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 expressly agrees that it is exclusively responsible for compliance with the Occupational Safety and Health Act (OSHA) and state and local regulations for construction and that it is the "employer" within the meaning of those regulations. It is the express intent of the parties that the Contractor, and not the Architect, Program Manager nor the Owner, is in charge of the Work. Any provision in the Contract Documents in conflict with this paragraph shall be null and void..

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,.

Insert BG: .4 the indoor air quality of buildings where students, teachers, employees and visitors occupy the areas adjacent to or near the Work on the Project site;and

Insert BH: .5 the exhaust systems and existing fresh air intake devices to prevent dust or fumes caused by Work entering such systems.

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

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 owners 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 Owner 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.

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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 Owner 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.

Insert BI: **10.2.8** The Contractor shall promptly report to the Architect and Owner in writing all accidents arising out of or in connection with the Work that cause death, personal injury, or property damage.

Insert BJ: **10.2.9** The Contractor is solely responsible for the security of all equipment, tools or other property of the Contractor, its Subcontractors, its Suppliers at the site to include any loss or damage due to theft or vandalism. The Contractor shall provide for any security at the site.

10.3 HAZARDOUS MATERIALS

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

10.3.2 The Owner 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 Owner 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 Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner 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 Owner 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 shut-down, delay and start-up, which adjustments shall be accomplished as provided in Article 7.

10.3.3 ~~To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, 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 in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Subparagraph 10.3.1 and has not been rendered harmless, 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) and provided that such damage, loss or expense is not due to the sole negligence of a party seeking indemnity.~~

10.4 The Owner 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 or a breach of the relevant provisions of the Contract Documents, 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 Owner 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.~~

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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 acceptable to the Owner lawfully authorized to do business in the jurisdiction in which the Project is located 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; and

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

11.1.2 The insurance required by Subparagraph 11.1.1 shall be written for not less than limits of liability specified below ~~in the Contract Documents~~ or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from date of commencement of the Work until date of final payment and termination of any coverage required to be maintained after final payment. All policies and certificates of insurance shall contain the following clauses.

Insert BK: **11.1.2.1** The Contractor/Subcontractor's insurer will have no right of recovery or subrogation against the Owner, it being the intention of the parties that the insurance policies so affected shall protect both parties and the primary coverage for any and all losses covered by the below described insurance. The Contractor shall provide a specific waiver of subrogation for the Workers' Compensation coverage.

Insert BL: **11.1.2.2** The Owner shall be named as an additional insured as regards negligence by the contractor (ISO Forms CG 20 10 11 85).

Insert BM: **11.1.2.3** The insurance companies issuing the policy or policies shall have no recourse against the Owner for payment of any premiums or for assessments under any form of policy.

Insert BN: **11.1.2.4** Any and all deductibles in the below described insurance policies shall be assumed by and be for the amount of, and at the sole risk of the Contractor.

11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner within ten (10) days of the award of the Contract and prior to signing the Contract. ~~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

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until at least 30 days' prior written notice has been given to the Owner. If any of the foregoing insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment as required by 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. Insurance is to be placed with insurers with an A.M. Best rating no less than A-:VI. This rating requirement will be waived for the Workers' Compensation coverage and policies written through Institute of London Underwriter (ILU) companies. All notices will name the Contractor and identify the specific Project and site. The insurance to be furnished by the Contractor is described below.

Insert BO: **11.1.3.1** Workers' compensation - Statutory - in compliance with the Compensation Law of the State of Louisiana. Exception: Employers liability to be $1,000,000 when work is to be over water and involves maritime exposures.

Insert BP: **11.1.3.2** Commercial General Liability Insurance with a combined single limit per occurrence for bodily injury and property damage. This insurance shall include coverage for bodily injury and property damage, and indicate on the certificate of Insurance which of the seven (7) coverages required below are not included in the policy, if any:

Insert BQ: 1 Premises - Operations; 3. Products and Completed Operations;
Insert BR: 2 Broad Form Contractual Liability; 4. Use of Contractors and Subcontractors;
Insert BS: 5. Personal Injury; 7. Explosion, Collapse and Underground (XCU) Coverage.
Insert BT: 6. Broad Form Property Damage;

Insert BU: *Note: On the certification of insurance, under the description of operations, the following wording is required: THE AGGREGATE LOSS LIMIT APPLIES TO EACH PROJECT, or a copy of ISO form CG2503 (Ed. 11-85) shall be submitted.*

Insert BV: Note: The Products and Completed Operations shall be maintained for two (2) years after the date of recording of the Notice by Owner of Acceptance of Work.

Insert BW: **COMBINED SINGLE LIMIT (CSL) - AMOUNT OF INSURANCE REQUIRED**

Insert BX: Type of	Projects Under	Projects $100,001 -	Projects Over
Insert BY: Construction	$100,000	$1,000,000	$1,000,000
Insert BZ: **New Buildings:**			
Insert CA: -Each Occurrence /	$500,000	$1,000,000	$3,000,000
Insert CB: Minimum Limit			
Insert CC: -Aggregate	$500,000	$1,000,000	$3,000,000
Insert CD:			
Insert CE: **Renovations:**	***The building(s) value will be used to determine the amount:***		
Insert CF: Each Occurrence/	$500,000***	$1,000,000***	$3,000,000***
Insert CG: Minimal Limit	(Depends on	(Depend on	(Depends on
Insert CH:	Building Value)	Building Value)	Building Value)
Insert CI: Aggregate	$500,000***	$1,000,000***	$3,000,000***
Insert CJ:	(Depends on	(Depends on	(Depends on
Insert CK:	Building Value)	Building Value)	Building Value)

*Insert CL: ***While the minimum combined single limit of $500,000 is required for all renovations, the value of a building shall be multiplied by 10% and insurance requirements will be increased at $1,000,000 intervals and rounded to the nearest $1,000,000. Maximum limit required is $5,000,000.00 regardless of building value.*

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Insert CM: **11.1.3.3** Business Automobile Liability Insurance with a combined single limit of $1,000,000 per occurrence for bodily injury and property damage, unless otherwise indicated. This insurance shall include for bodily injury and property damage the following coverages:

Insert CN: 1 Owned automobiles;
Insert CO: 2. Hired automobiles;
Insert CP: 3. Non-owned automobiles.

Insert CQ: **11.1.3.4** An Umbrella Policy may be used to meet minimum requirements.

Insert CR: **11.1.3.5** For a project involving roofing work, the Contractor's general liability coverage must include a pollution liability coverage extension which affords coverage for claims resulting from jobsite fumes and vapors. In the event the roofing work is to be performed by a subcontractor, the Contractor shall require the subcontractor to provide a certificate of insurance for general liability coverage with a pollution liability coverage extension which affords coverage for claims resulting from jobsite fumes and vapors. In such case, the subcontractor shall have the Owner named as an additional insured and the certificate of insurance shall comply with the other requirements set forth in Article 11.

Insert CS: **11.1.4** All property losses shall be made payable to and adjusted with the Owner.

Insert CT: **11.1.5** All policies of insurance shall be approved by the Owner's insurance advisor prior to the Owner signing the Contract.

Insert CU: **11.1.6** Other insurance required is as follows:

Insert CV: **11.1.6.1** Owner's and Contractor's Protective Liability Insurance shall be furnished by the Contractor and name the East Baton Rouge Parish School Board as the Insured.

Insert CW:		Projects $100,001-	Projects Over
Insert CX:		$1,000,000	$1,000,000
Insert CY:	CSL - Each Occurrence	$1,000,000	$3,000,000

Insert CZ: **11.1.6.2** Asbestos Abatement Liability
Insert DA: *(required when asbestos abatement is included in the Work)*

Insert DB: The Contractor or subcontractor who will be doing the asbestos abatement as outlined in the Contract Documents for an asbestos abatement Project shall obtain and maintain such liability coverage for the asbestos abatement hazard and exposure with minimum limits of $1,000,000 per occurrence for the duration of the project. The policy shall name the East Baton Rouge Parish School Board as an additional insured for the project. The policy shall be written on an "occurrence" form without a sunset clause. Claims-made coverage is unacceptable. The insurance company shall have an A.M. Best rating of at least A-VI or better or written through Lloyds of London or Institute of London Underwriter (ILU) companies.

Insert DC: **11.1.7** If, at any time, any of the said policies shall be or become unsatisfactory to the Owner, as to form or substance, or if a company issuing any such policy shall be or become unsatisfactory to the Owner, the Contractor/Subcontractor shall promptly obtain a new policy, submit the same to the Owner for approval and submit a certificate thereof as hereinabove provided.

Insert DD: **11.1.8 RISKS AND INDEMNIFICATIONS ASSUMED BY THE CONTRACTOR**

Insert DE: **11.1.8.1** If any of the Property and Casualty insurance requirements are not complied with at their renewal dates, payments to the Contractor will be withheld until those requirements have been met, or at the

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option of the Owner, the Owner may pay the Renewal Premium and withhold such payments from any monies due the Contractor.

Insert DF: **11.1.8.2** All policies and certificates of insurance shall be approved by the Owner prior to the Owner signing of the Contract.

Insert DG: **11.1.8.3** If at any time any of the foregoing policies shall be or become unsatisfactory to the Owner, as to form or substance, or if a company issuing any such policy shall be or become unsatisfactory to the Owner, the Contractor shall, upon notice to that effect from the Owner, promptly obtain a new policy, submit the same to the Owner for approval and submit a certificate thereof as hereinabove provided. Upon failure of the Contractor to furnish, deliver and maintain such insurance as above provided, this Contract, at the election of the Owner, may be forthwith declared suspended, discontinued or terminated. Failure of the Contractor to take out and/or maintain or the taking out and/or maintenance of any required insurance, shall not relieve the Contractor from any liability under the Contract, nor shall the insurance requirements be construed to conflict with or otherwise limit the obligations of the Contractor concerning indemnification. The Owner reserves the right to require complete, certified copies of all required insurance policies, at any time.

Insert DH: **11.1.9 SUBCONTRACTORS**
Insert DI: Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.

Insert DJ: **11.1.10 CERTIFICATES OF INSURANCE**
Insert DK: Contractor shall furnish to the Owner's Program Manager the certificates of insurance stating the coverages required by Article 11, prior to signing the Contract. The certificates for each insurance policy are to be signed by a person authorized by the insurer to bind coverage on its behalf. The certificates must be approved by the Owner's insurance consultant. Updated certificates must be submitted to the Owner's Program Manager prior to the expiration of any coverage to allow for the review by the Owner's insurance consultant. The Owner reserves the right to require complete, certified copies of all required insurance policies, at any time.

11.2 OWNER'S LIABILITY INSURANCE
11.2.1 ~~The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.~~
Insert DL: **11.2 INSURANCE REQUIREMENTS FOR CONTRACTORS**
Insert DM: Contractor shall procure and maintain the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the Work hereunder by the Contractor, his agents, representatives, employees or subcontractors. The cost of such insurance shall be included in the Contractor's bid.

Insert DN: **11.2.1 MINIMUM SCOPE OF INSURANCE**

Insert DO: Coverage shall be at least as broad as:

Insert DP: **11.2.1.1** Insurance Services Office form number GL 0002 (Ed. 1/73) covering Comprehensive General Liability and Insurance Services Office form number GL 0404 concerning Broad Form Comprehensive General Liability; or Insurance Services Office Commercial General Liability coverage ("occurrence" form CG 0001). "Claims Made" form is unacceptable. The "occurrence form" shall not have a "sunset clause."

Insert DQ: **11.2.1.2** Insurance Services Office form number CA 0001 (Ed. 1/78) covering Automobile Liability and endorsement CA 0025 or CA 0001 12 90. The policy shall provide coverage for owned, hired, and non-owned coverage. If an automobile is to be utilized in the execution of this contract, and the vendor/contractor does not own a vehicle, then proof hired and non-owned coverage is sufficient.

Insert DR: **11.2.1.3** Workers' Compensation insurance as required by the Labor Code of the State of Louisiana, including

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Employers Liability insurance.

Insert DS: **11.2.2 MINIMUM LIMITS OF INSURANCE**
Insert DT: Contractor shall maintain limits no less than:

Insert DU: **11.2.2.1** Commercial General Liability: $500,000 combined single limit per occurrence for bodily injury,personal injury and property damage (or higher limits depending on size of contract).

Insert DV: **11.2.2.2** Automobile Liability: $500,000 combined single limit per accident, for bodily injury and property damage (or higher limits depending on size of contract).

Insert DW: **11.2.2.3** Workers Compensation and Employers Liability: Workers' Compensation limits as required by the Labor Code of the State of Louisiana and Employers Liability coverage. Exception: Employers liability limit is to be $1,000,000.

Insert DX: **11.2.3 DEDUCTIBLES AND SELF-INSURED RETENTIONS**
Insert DY: Any deductibles or self-insured retentions must be declared to and approved by the Owner. At the option of the Owner, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Owner, its officers, officials, employees and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

Insert DZ: **11.2.4 OTHER INSURANCE PROVISIONS**
Insert EA: The policies are to contain, or be endorsed to contain, the following provisions:

Insert EB: **11.2.4.1** General Liability and Automobile Liability Coverages

Insert EC: **11.2.4.1.1** The Owner, its officers, officials, employees, Boards and/ and volunteers are to be added as "additional insureds" as respects liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor, premises owned, occupied or used by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Owner, its officers, officials, employees or volunteers.

Insert ED: It is understood that the business auto policy under "Who is an Insured" automatically provides liability coverage in favor of the East Baton Rouge Parish School Board.

Insert EE: **11.2.4.1.2** Any failure to comply with reporting provisions of the policy shall not affect coverage provided to the Owner, its officers, employees, Boards and/or volunteers.

Insert EF: **11.2.4.1.3** The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

Insert EG: **11.2.4.3** All Coverages
Insert EH: Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the Owner.

Insert EI: **11.2.5 ACCEPTABILITY OF INSURERS**

Insert EJ: Insurance is to be placed with insurers with an A.M. Best's rating of no less than A-:VI. This rating requirement will be waived for the workers' compensation coverage and policies written through Lloyds of London or Institute of London Underwriter (ILU) companies.

Insert EK: **11.2.6 VERIFICATION OF COVERAGE**
Insert EL: Contractor shall furnish the Owner's Program Manager with certificates of insurance effecting coverage

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required. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The Owner reserves the right to require complete, certified copies of all required insurance policies, at any time.

Insert EM:

11.3 PROJECT MANAGEMENT PROTECTIVE LIABILITY INSURANCE

11.3.1 ~~Optionally, the Owner may require the Contractor to purchase and maintain Project Management Protective Liability insurance from the Contractor's usual sources as primary coverage for the Owner's, Contractor's and Architect's vicarious liability for construction operations under the Contract. Unless otherwise required by the Contract Documents, the Owner shall reimburse the Contractor by increasing the Contract Sum to pay the cost of purchasing and maintaining such optional insurance coverage, and the Contractor shall not be responsible for purchasing any other liability insurance on behalf of the Owner. The minimum limits of liability purchased with such coverage shall be equal to the aggregate of the limits required for Contractor's Liability Insurance under Clauses 11.1.1.2 through 11.1.1.5.~~

11.3.2 ~~To the extent damages are covered by Project Management Protective Liability insurance, the Owner, Contractor and Architect waive all rights against each other for damages, except such rights as they may have to the proceeds of such insurance. The policy shall provide for such waivers of subrogation by endorsement or otherwise.~~

11.3.3 ~~The Owner shall not require the Contractor to include the Owner, Architect or other persons or entities as additional insureds on the Contractor's Liability Insurance coverage under Paragraph 11.1.~~

11.4 PROPERTY INSURANCE

11.4.1 Unless otherwise provided, the **CONTRACTOR** ~~Owner~~ shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" of direct physical loss or damage or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Paragraph 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Paragraph 11.4 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project. Any deductible under the policy per claim for loss or damage shall be paid by the Contractor.

Insert EN: **11.4.1.2** The Contractor may at his option and cost provide additional insurance which will protect the interest of itself and its Subcontractors in the work to include their tools, equipment and fixtures.

Insert EO: **11.4.1.3** A copy of the policy shall be provided by the Contractor to the Architect and Owner.

Insert EP: **11.4.1.4** In the event of a loss or claim, the Contractor shall notify the Architect and the Owner's Program Manager, with confirmation in writing, providing all information, such as the date, type of loss, approximate extent of damage, location of loss and Project number.

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

11.4.1.2 ~~If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance which will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.~~

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11.4.1.3 ~~If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.~~

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

11.4.1.5 Partial occupancy or use in accordance with Paragraph 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner 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.

11.4.2 ~~**Boiler and Machinery Insurance.** The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.~~

11.4.3 ~~**Loss of Use Insurance.** The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.~~

11.4.4 ~~If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.~~

11.4.5 ~~If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Subparagraph 11.4.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.~~

11.4.6 ~~Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Paragraph 11.4. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.~~

11.4.7 Waivers of Subrogation. The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Paragraph 11.4 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

11.4.8 A loss insured under Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and

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of Subparagraph 11.4.10. 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.

11.4.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or in accordance with an arbitration award in which case the procedure shall be as provided in Paragraph 4.6. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

11.4.10 ~~The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved as provided in Paragraphs 4.5 and 4.6. The Owner as fiduciary shall, in the case of arbitration, make settlement with insurers in accordance with directions of the arbitrators. If distribution of insurance proceeds by arbitration is required, the arbitrators will direct such distribution.~~

11.5 PERFORMANCE BOND AND PAYMENT BOND

11.5.1 The Owner ~~shall have the right to~~ requires the Contractor to furnish a performance bond ~~bonds~~ covering faithful performance of the Contract and a labor and payment bond for covering of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract using the Owner's bond forms.

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.

Insert EQ: **11.5.3 RECORDING OF CONTRACT AND BOND [38:2241A(2)]**

Insert ER: The Contractor shall record prior to the start of the Work the complete Contract Between Owner and Contractor together with the Performance Bond and the Payment Bond with the Clerk of Court in East Baton Rouge Parish and furnish the recording information to the Owner's Program Manager and the Architect.

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 Architect's request or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time or the Contract Sum.

12.1.2 If a portion of the Work has been covered which is not contrary to the requirements specified in the Contract Documents the Architect has not specifically requested to examine prior to its being covered, the Architect or the Owner 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 Owner's expense. If such Work is not in accordance with the Contract Documents, costs of uncovering, replacement and correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

12.2 CORRECTION OF WORK

12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

12.2.1.1 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.

12.2.2 AFTER SUBSTANTIAL COMPLETION

12.2.2.1 In addition to the Contractor's obligations under Paragraph 3.5 and without any limitation of the obligations under

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Paragraph 1.3.5, 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, at Contractor's expense the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor, ~~and to make a claim for breach of warranty.~~ If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Paragraph 2.4.

12.2.2.2 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 completion of the performance of the Work.

12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Paragraph 12.2.

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 Owner.

12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner 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 or the warranty provided by law 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 Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, the Owner may 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 the law of the place where the Project is located.

13.2 SUCCESSORS AND ASSIGNS

13.2.1 The Owner 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. ~~Except as provided in Subparagraph 13.2.2, neither~~ 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.

13.2.2 ~~The Owner may, without consent of the Contractor, assign the Contract to an institutional lender providing construction financing for the Project. In such event, the lender shall assume the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.~~

13.3 WRITTEN NOTICE

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13.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or a member of the firm or entity or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified mail to the last business address known to the party giving notice.

13.4 RIGHTS AND REMEDIES

13.4.1 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 Owner, 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.

Insert ES: **13.4.3** The Nineteenth Judicial Court in and for the Parish of East Baton Rouge, State of Louisiana shall have sole and exclusive jurisdiction in any action brought under the Contract. In the event of diversity for the purposes of federal court jurisdiction or any other cause of action which may allow for federal court jurisdiction or venue, the Contractor, its surety, its subcontractors, suppliers specifically waive any right or cause of action to be filed, transferred or tried in any federal court. The sole court granted exclusive jurisdiction of any action is the Nineteenth Judicial Court in the Parish of East Baton Rouge, State of Louisiana.

13.5 TESTS AND INSPECTIONS

13.5.1 Tests, 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. ~~Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals.~~ The Contractor shall make arrangements for such tests, inspections and approvals with the Testing Laboratory provided by the Owner, and the Owner shall bear all related costs of tests, inspections and approvals. 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 Owner shall bear costs of tests, inspections or approvals which do not become requirements until after bids are received or negotiations concluded.~~

13.5.2 If the Architect, Owner 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 Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, 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 Owner'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.

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.

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

Insert ET: **13.5.7** Where the Contract Documents require that the Work be inspected, tested , or approved, and when the Contractor believes the Work or any part thereof is Substantially Complete, the Contractor shall give timely notice of the same, including written notice when required. However, should any part of the Work requiring testing, inspection, or

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approval not be in readiness, Contractor shall pay the salaries, professional fees, travel and living expenses, as applicable, for persons inconvenienced by inaccurate notice.

13.6 INTEREST

13.6.1 Payments due and unpaid under the Contract Documents shall bear NO interest charges of any nature. ~~from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.~~

13.7 COMMENCEMENT OF STATUTORY LIMITATION PERIOD

13.7.1 ~~As between the Owner 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 shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than such 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 and prior to issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than 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 shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than 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 Owner, whichever occurs last.~~

Insert EU: **13.8 PROGRESS AND COORDINATION MEETINGS**

Insert EV: **13.8.1** Pre-Construction Conference shall be held prior to the Notice to Proceed. The following shall be in attendance: Owner, Architect and consultants, Contractor and Superintendent, major subcontractors and representatives of separate contractors, when applicable. The Contractor shall submit to the Architect prior to or at the Pre-Construction meeting the following: (1) List of major subcontractors and their phone numbers, (2) list of Contractor's Superintendent and Project Manager with 24 hour phone numbers, (3) Tentative (CPM) construction progress schedule and submittals schedule.

Insert EW: **13.8.2** Progress and coordination meetings will be held monthly on site or as changed in writing by the Owner. The Contractor shall distribute minutes of each meeting to all participants within seven (7) days of each meeting. The following are expected to attend: The Contractor represented by its Project Manager or Principal, the Contractor's Project Superintendent, the Subcontractors and material suppliers requested by the Owner or Architect, the Architect and the Owner.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

14.1.1 The Contractor may terminate the Contract if all of the Work is stopped for a period of 30 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;

.3 because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Subparagraph 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

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.4 ~~the Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Subparagraph 2.2.1.~~

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 Owner 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 Owner and Architect, terminate the Contract and recover from the Owner payment for Work properly executed and for proven loss with respect to materials, equipment, tools, and construction equipment and machinery, including reasonable overhead, ~~profit and damages~~ and profit as to the portion of the Work which was installed, performed and/or stored on the site. The Contractor shall not be entitled to recover consequential damages or profit or overhead for any portion of the Work or the Contract which is not performed.

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 Owner has persistently failed to fulfill the Owner'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 Owner and the Architect, terminate the Contract and recover from the Owner as provided in Subparagraph 14.1.3.

14.2 TERMINATION BY THE OWNER FOR CAUSE

14.2.1 The Owner may terminate the Contract if the Contractor:

.1 persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials for the Project or any portion or site of the Project;

.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;

.3 persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction; or

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents; or

.5 failure to complete the "punch list" within the time as provided in Subparagraph 9.8.3.1.

Insert EX:

14.2.2 When any of the above reasons exist, the Owner, upon certification by the Architect that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, 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 Owner may deem expedient. Upon request of the Contractor, the Owner shall furnish to the Contractor ~~a detailed~~ an accounting of the costs incurred by the Owner in finishing the Work.

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14.2.3 When the Owner 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. Termination by the Owner shall not suspend assessment of liquidated damages against the surety.

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 incurred by the Owner 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 Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Architect, upon application, and this obligation for payment shall survive termination of the Contract.

Insert EY: **14.2.5** Liquidated damages have been established and termination by the Owner under this Article will not relieve the Contractor and/or Surety of their obligations under the liquidated damages provisions and the Contractor and/or Surety shall be liable to the Owner for per diem liquidated damages.

14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

14.3.1 The Owner 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 Owner may determine.

14.3.2 The Contract Sum and Contract Time shall be adjusted for any increases in the cost and time caused by suspension, delay or interruption as described in Subparagraph 14.3.1. Any Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent:

.1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

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

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner 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.

14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

Insert EZ: **ARTICLE 15 - EQUAL OPPORTUNITY**

Insert FA: **15.1** The Contractor and all Subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, religion, color, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment, notices setting forth the policies of nondiscrimination.

Insert FB: **15.2** The Contractor and all Subcontractors shall, in all solicitations or advertisement for employees placed by

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them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex or national origin.

15.3 The Contractor shall identify on the Schedule of Values all subcontractors and suppliers which are minority-owned businesses or women-owned businesses.

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SECTION 00310
BID FORM

DIRECTOR OF PHYSICAL PLANT SERVICES
EAST BATON ROUGE SCHOOL BOARD
2875 MICHELLI DRIVE
BATON ROUGE, LOUISIANA 70805

Gentlemen:

1. BASE BID:

Pursuant to and in compliance with the Advertisement for Bids and the proposed Contract Documents relating to the construction of:

PROJECT NAME AND NUMBER: **McKinley Middle Magnet School**
1550 Eddie Robinson Sr. Drive
Baton Rouge, LA
EBRPSS Project No. 710.002

including all Addenda issued prior to the date of the opening bids, the undersigned certifies that he has received all addenda issued and having become thoroughly familiar with terms and conditions of the proposed Contract Documents and with local conditions affecting the performance, progress and cost of the work that is to be completed and having fully inspected the site in all particulars, hereby proposes and agrees to fully perform the work within the time stated and in accordance with the Contract Documents including furnishing any and all services, labor, materials, and equipment and to do all the work required to construct and complete said work in accordance with the Contract Documents for the following lump sum:

_____ Dollars.

($_____) which Sum is hereinafter called the "Base Bid".

2. ALTERNATES:

The Undersigned proposes that should any of the following Alternates be accepted and incorporated into the Contract, the Base Bid will be altered in each case as follows. (See "Alternates" section of the specifications for a complete description of Alternates.)

NONE

Alternate No. 1:

(Add)

Dollars ($_____) to Base Bid.

3. TIME OF COMPLETION: Bidder hereby agrees the Contract Time shall commence ten (10) days from the date of the Award Notice or as established in a Notice to Proceed with

work at the site, whichever occurs first and shall substantially complete the work within Four hundred fifty (450) consecutive calendar days or within the time as may be extended as provided in the Contract Documents and final completion within thirty (30) days of the date of Substantial Completion.

4. BID SECURITY:

Bid security in the amount of five percent (5%) of the Base Bid and any additive alternates is attached, which is to become the property of the Owner in the event the Contract and Performance Bond and Payment Bond are not executed within the time set forth, as liquidated damages for the delay and additional cost caused the Owner.

The Undersigned agrees that upon receipt of the Notice of Award of his Bid, he will, within ten (10) days from the Notice of Award, execute the formal Contract (AIA Document A101-1997), and will deliver a Performance Bond for the faithful performance of this Contract, a Labor and Materials Payment Bond, and such other bonds and insurance as required by the specifications.

The Undersigned further agrees that if he fails or neglects within the specified time to execute the Contract of which this Proposal, the Bidding Documents and the Contract Documents are a part, the Undersigned will be considered as having abandoned the Contract, and the Bidder's Bond accompanying this Proposal will be forfeited to the Owner by reason of such failure on the part of the Undersigned.

5. LIQUIDATED DAMAGES:

The bidder agrees to pay as Liquidated Damages the sum of One Thousand dollars ($ 1,000.00) for each consecutive calendar day for which the work is not substantially complete beginning with the first day beyond the completion time stated above. Further, bidder agrees to pay as Liquidated Damages, the sum of One Thousand dollars ($_1,000.00_) for each consecutive calendar day for which the list of items to be completed or corrected (punch list) is not complete beginning with the thirty-first day after the date of substantial completion. Set sums shall in no event be construed to be a penalty; but only as damages fixed and agreed upon in advance.

6. NONCOLLUSION AFFIDAVIT:

The bidder agrees and has executed the Non-collusion Affidavit, which is a part of the Bidding Documents. The affidavit is attached by the bidder to this Bid Form.

7. LICENSE CERTIFICATION:

The bidder by signing below certifies that he meets all licensing requirements for the State of Louisiana and is duly and currently licensed under La.R.S. 37:2150, et seq., of the State of Louisiana. **The bidder shall show his license number on the envelope containing this bid proposal and above his signature at the end of this bid.**

8. PREFERENCE:

Only if a non-resident contractor, bidder certifies that his state of domicile.

Provides
- or -
Does not Provide

(Strike Out Inapplicable Phrase)

percentage preference in the favor of contractors domiciled in the state of his domicile over Louisiana resident contractors for the same type of work. If there is a preference, it is _____% (Fill in if applicable).

Respectfully submitted,

LOUISIANA CONTRACTOR'S LICENSE NUMBER_____

Signature of Bidder: _____

Print Name and Title: _____

If a Sole Proprietorship
Doing Business as:
Business Address: _____

Telephone Number: _____

If a Partnership: Name of Business:
Name of Partners: _____

Business Address: _____

Telephone Number: _____

If Corporation: Name of Corporation:

State of Incorporation: _____

Business Address: _____

Telephone Number: _____

_____
DATE SIGNED

ATTACHMENTS:

Bid Security
Non-Collusion Affidavit

NON-COLLUSION AFFIDAVIT

STATE OF LOUISIANA
PARISH OF EAST BATON ROUGE

SCHOOL: _____
PROJECT NO:_____

AFFIDAVIT

BEFORE ME, the undersigned authority, duly commissioned and qualified within and for the state and parish aforesaid, personally came and appeared _____ representing _____ who, being by me first duly sworn deposed and said that he has read this affidavit and does hereby agree under oath to comply with all provisions herein as follows:

Section 2224 of Part II of Chapter 10 of Title 38 of the La. Revised Statutes of 1950 as amended.

(1) That affiant and his firm employed no person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract for the above-referenced project with the East Baton Rouge Parish School Board under which he will, if awarded the contract, receive or received payment, other than persons regularly employed by the affiant whose services in connection with the construction, alteration or demolition of the public building or project or in securing the public contract were in the regular course of their duties for affiant; and

(2) That no part of the contract price to be received or received by affiant or his firm was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the contract, other than the payment of their normal compensation to persons regularly employed by the affiant whose services in connection with the construction of the public building or project were in the regular course of their duties for affiant.

Bidder or representative to sign
and type name below signature➔

_____**AFFIANT**

SWORN TO AND SUBSCRIBED BEFORE ME THIS _____ DAY OF

_____, 2003.

_____
NOTARY PUBLIC

Note: This form is to be removed and attached to the Bid Proposal Form.

AIA Document A310 - Electronic Format

Bid Bond

THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES: CONSULTATION WITH AN ATTORNEY IS ENCOURAGED WITH RESPECT TO ITS COMPLETION OR MODIFICATION. AUTHENTICATION OF THIS ELECTRONICALLY DRAFTED AIA DOCUMENT MAY BE MADE BY USING AIA DOCUMENT D401.

KNOW ALL MEN BY THESE PRESENTS, that we

(Here insert full name and address or legal title of Contractor)

as Principal, hereinafter called the Principal, and

(Here insert full name and address or legal title of Surety)

a corporation duly organized under the laws of the State of as Surety, hereinafter called the Surety, are held and firmly bound unto
Roger Moser, President
East Baton Rouge Parish School Board
2875 Michelli Drive
Baton Rouge, LA 70805

(Here insert full name and address or legal title of Owner)

as Obligee, hereinafter called the Obligee, in the sum of _____ Dollars ($_____), for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for

(Here insert full name, address and description of project)

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee 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.

Signed and sealed this _____ day of _____ 20_____

_____ *(Witness)*

_____ *(Principal)* *(Seal)*

_____ *(Title)*

_____ *(Witness)*

_____ *(Surety)* *(Seal)*

_____ *(Title)*

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Standard Form of Agreement Between Owner and Contractor *where the basis of payment is a* STIPULATED SUM

AIA Document A101-1997
1997 Edition -Electronic Format

THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES. CONSULTATION WITH AN ATTORNEY IS ENCOURAGED WITH RESPECT TO ITS COMPLETION OR MODIFICATION. AUTHENTICATION OF THIS ELECTRONICALLY DRAFTED AIA DOCUMENT MAY BE MADE BY USING AIA DOCUMENT D401

AIA Document A201-1997, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

This document has been approved and endorsed by The Associated General Contractors of America.

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AGREEMENT made as of the day of in the year of 2004
(In words, indicate day, month and year)

BETWEEN the Owner:
(Name, address and other information)
EAST BATON ROUGE PARISH SCHOOL BOARD
1050 SOUTH FOSTER DRIVE
BATON ROUGE, LOUISIANA 70806
herein represented by Roger Moser, its President, duly authorized

and the Contractor
(Name, address and other information)

The Project is:
(Name and location)

The Architect is:
(Name, address and other information)

The Owner and Contractor agree as follows.

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement and Modifications issued after execution of this Agreement; these form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. An enumeration of the Contract Documents, other than Modifications, appears in Article 8.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except to the extent specifically indicated in the

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Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

3.1 The date of commencement of the Work shall be ~~the date of this Agreement unless a different date is stated below or provision is made for the date to be fixed in a notice to proceed issued by the Owner.~~

(Insert the date of commencement if it differs from the date of this Agreement or, if applicable, state that the date will be fixed in a notice to proceed.)

ten (10) days from the date of the Award Notice or as established in a Notice to Proceed, whichever occurs first.

~~If, prior to the commencement of the Work, the Owner requires time to file mortgages, mechanic's liens and other security interests, the Owner's time requirement shall be as follows:~~

3.2 The Contract Time shall be measured from the date of commencement.

3.3 The Contractor shall achieve Substantial Completion of the entire Work not later than _____ days from the date of commencement, ~~or as follows:~~

(Insert number of calendar days. Alternatively, a calendar date may be used when coordinated with the date of commencement. Unless stated elsewhere in the Contract Documents, insert any requirements for earlier Substantial Completion of certain portions of the Work.)

, subject to adjustments of this Contract Time as provided in the Contract Documents.

(Insert provisions, if any, for liquidated damages relating to failure to complete on time or for bonus payments for early completion of the Work.)

ARTICLE 4 CONTRACT SUM

4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be Dollars ($), subject to additions and deductions as provided in the Contract Documents.

4.2 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and are hereby accepted by the Owner:

(State the numbers or other identification of accepted alternates. If decisions on other alternates are to be made by the Owner subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires)

4.3 Unit prices, if any, are as follows:

None

ARTICLE 5 PAYMENTS

5.1 PROGRESS PAYMENTS

5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

5.1.3 ~~Provided that an Application for Payment is received by the Architect not later than the~~ _~~day of a month, the Owner shall make payment to the Contractor not later than the day of the month. If an Application for Payment is received by the Architect after the application date fixed above, payment shall be made by the Owner not later than days after the Architect receives the Application for Payment.~~ After the Architect has issued and delivered to the Owner's Program Manager a Certificate for Payment, the Owner's Program Manager will review the Certificate for Payment and either(1) if found to be in proper order forward it for payment; or (2) if found to be erroneous in any respect (e.g information format, amounts, percents or other similar items). review such errors with the Architect and either return the Certificate for Payment to the Architect for correction, recertification and reprocessing with the pssible return to the Contractor, or hand correct the Certificate for Payment to reflect the necessary corrections upon the mutual agreement with th Architect, the Owner shall make payment within (15) fifteen days after the Program Manager's receipt of a valid Certificate for Payment and shall notify the Architect. Erroneous Certificates for Payment may cause delays in processing for payment. Such shall

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not constitue cause for seeking claims or compensation for additional Contract Sum and/or Contract Time.

5.1.4 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, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

5.1.5 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.

5.1.6 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 five percent (5 %). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included as provided in Subparagraph 7.3.8 of AIA Document A201-1997;

.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 Owner, suitably stored off the site at a location agreed upon in writing), less retainage of five percent (5 %);

.3 Subtract the aggregate of previous payments made by the Owner; 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 AIA Document A201-1997.

5.1.7 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 the full amount of the Contract Sum, less such amounts as the Architect shall determine for incomplete Work, liquidated damages, if any, retainage applicable to such work and unsettled claims; and
(Subparagraph 9.8.5 of AIA Document A201-1997 requires release of applicable retainage upon Substantial Completion of Work with consent of surety, if any.)

.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 AIA Document A201-1997.

5.1.8 Reduction or limitation of retainage, if any, shall be as follows:
(If it is intended, prior to Substantial Completion of the entire Work, to reduce or limit the retainage resulting from the percentages inserted in Clauses 5.1.6.1 and 5.1.6.2 above, and this is not explained elsewhere in the Contract Documents, insert here provisions for such reduction or limitation.)
None

5.1.9 Except with the Owner'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

5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner 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 AIA Document A201-1997, and to satisfy other requirements, if any, which extend beyond final payment; and

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

5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

ARTICLE 6 TERMINATION OR SUSPENSION

6.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201-1997.

6.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201-1997.

ARTICLE 7 MISCELLANEOUS PROVISIONS

7.1 Where reference is made in this Agreement to a provision of AIA Document A201-1997 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

7.2 Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)
None

(Usury laws and requirements under the Federal Truth in Lending Act, similar state and local consumer credit laws and other regulations at the Owner's and Contractor's principal places of business, the location of the Project and elsewhere may affect the validity of this provision. Legal advice should be obtained with respect to deletions or modifications, and also regarding requirements such as written disclosures or waivers.)

7.3 The Owner's representative is:
(Name, address and other information)
CSRS/The Facility Group
2875 Michelli Drive
Baton Rouge, Louisiana 70805

7.4 The Contractor's representative is:
(Name, address and other information)

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

7.6 Other provisions:
Liquidated damages are specified in the Bid Proposal Form and the Contractor agrees pay any liquidated damages not by way of penalty but as a stipulated sum in the event the Project is not substantially completed within the Contract Time or the list of items to be completed or corrected are not completed within thirty (30) days of the date of the Certificate of Substantial Completion for the Project.

ARTICLE 8 ENUMERATION OF CONTRACT DOCUMENTS

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

8.1.1 The Agreement is this executed 1997 edition of the Standard Form of Agreement Between Owner and Contractor, AIA Document A101-1997.

8.1.2 The Owner's ModifiedGeneral Conditions are the 1997 edition of the General Conditions of the Contract for Construction, AIA Document A201-1997 as modified by the Owner.

8.1.3 The ~~Supplementary and~~ other Conditions of the Contract are those contained in the Project Manual dated , and are as follows:

Document	Title	Pages

8.1.4 The Specifications are those contained in the Project Manual dated as in Subparagraph 8.1.3, and are as follows:
(Either list the Specifications here or refer to an exhibit attached to this Agreement.)

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Section	Title	Pages

8.1.5 The Drawings are as follows, and are dated unless a different date is shown below:
(Either list the Drawings here or refer to an exhibit attached to this Agreement.)

Number	Title	Date

8.1.6 The Addenda, if any, are as follows:

Number	Date	Pages

Portions of Addenda relating to bidding requirements are not part of the Contract Documents unless the bidding requirements are also enumerated in this Article 8.

8.1.7 Other documents, if any, forming part of the Contract Documents are as follows:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201-1997 provides that bidding requirements such as advertisement or invitation to bid, Instructions to Bidders, sample forms and the Contractor's bid are not part of the Contract Documents unless enumerated in this Agreement. They should be listed here only if intended to be part of the Contract Documents.)
Instruction to Bidders, the Bid Proposal Form.

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 Owner.

OWNER *(Signature)*
EAST BATON ROUGE PARISH SCHOOL BOARD

By: Roger Moser, its President
(Printed name and title)

CONTRACTOR *(Signature)*

(Printed name and title)

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EAST BATON ROUGE PARISH SCHOOL BOARD

PERFORMANCE BOND (Louisiana Form)

KNOW ALL MEN BY THESE PRESENTS that (insert full name and address or legal title of Contractor, _____ _____ as Principal, hereinafter called Contractor, and, (insert full name and address or legal title of Surety, _____ a corporation duly organized under the laws of the _____, and authorized to do business in the State of Louisiana, as Surety, hereinafter called Surety, are held and firmly bound unto **EAST BATON ROUGE PARISH SCHOOL BOARD, Physical Plant Services, 2875 Michelli Drive, Baton Rouge, Louisiana 70805,** as Obligee, hereinafter called Owner, in the amount of _____ Dollars (_____) for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written agreement dated, _____, entered into a contract with Owner for (insert full name, address and description of project) _____, in accordance with the Drawings and Specifications prepared by (insert full name and address or legal title of Architect, _____ which Contract and Contract Documents referred to therein are and by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION of this obligation is such that, if the said Contractor shall promptly and faithfully perform all and singular the obligations assumed by said Contractor in the aforesaid Contract during the term of said Contract and any extension thereof that may be granted by the EAST BATON ROUGE PARISH SCHOOL BOARD, with or without notice to the Surety, and during the life of any term or condition, including but not limited to any guaranty required under the Contract, or by law, and shall also perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said Contract that may hereafter be made, notice of modifications, substitutions, additions, deletions or revisions to the Surety being hereby waived; and shall fully secure and protect the said EAST BATON ROUGE PARISH SCHOOL BOARD, its legal successor and representative, from all liability in the premises, and from all loss or expense of any kind, including all costs of court and all attorney's fees made necessary or arising from the failure, refusal or neglect of the Contractor, to comply with the obligations assumed by Contractor, then this bond shall be null and void; otherwise, it shall remain in full force and effect.

Contractor and Surety, by act of signing this Bond, consent and yield to the exclusive jurisdiction of the Nineteenth District Court for the Parish of East Baton Rouge, Louisiana and do formally waive fully any lack of jurisdiction on account of their residence elsewhere, in the event of a law suit under the Contract or this Bond.

This Bond is furnished pursuant to the provisions of Louisiana Revised Statutes 38:2216 and the only right of action which shall accrue on this Bond is solely to the benefit of the

Obligee named herein and its successors or assigns, and no other person shall have any right of action based thereon.

Signed and Sealed this _____ day of _____.

CONTRACTOR AS PRINCIPAL	**SURETY**
_____	_____
Company (Corporate Seal)	Company (Corporate Seal)
Signature: _____	Signature: _____
_____	_____
Name and Title	Name and Title (Attach certified copy of Power of Attorney)
	Address_____ _____
	Telephone Number_____

EAST BATON ROUGE PARISH SCHOOL BOARD

LABOR AND MATERIALS PAYMENT BOND (Louisiana Form)

KNOW ALL MEN BY THESE PRESENTS that (insert full name and address or legal title of Contractor) _____, as Principal, hereinafter called Contractor, and, (insert full name and address or legal title of Surety__ _____, a corporation duly organized under the laws of the State of _____, and authorized to do business in the State of Louisiana, as Surety, hereinafter called Surety, are held and firmly bound unto **EAST BATON ROUGE PARISH SCHOOL BOARD, Physical Plant Services, 2875 Michelli Drive, Baton Rouge, Louisiana 70805,** as Obligee, hereinafter called Owner, in the amount of _____ Dollars (_____) for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Contractor has by written agreement dated _____, entered into a contract with Owner for (insert full name, address and description of project) _____, in accordance with the Drawings and Specifications prepared by (insert full name and address or legal title of Architect) _____, which Contract and Contract Documents referred to therein are and by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION of this obligation is such that, if the said Contractor shall well and faithfully and shall promptly pay all claimants as defined in Louisiana Revised Statutes 38:2242 and as provided by law in Louisiana Revised Statutes 38:2241, et seq., and pay all wages of laborers, workmen, or mechanics, to be employed by Contractor for all work done or labor performed, or who may be employed by any sub-contractor; and shall promptly pay all furnishers of materials or supplies provided to Contractor, or by or to sub-contractors, and used in the construction, erection, alteration, installation, or repair called for by the aforesaid Contract; and shall promptly pay for all materials or supplies furnished to said Contractor, or by or to any sub-contractor, for use in machines used by the Contractor, or any sub-contractor, in the construction, erection, alteration, installation, or repair of the work specified in the aforesaid Contract; and shall fully secure and protect the EAST BATON ROUGE PARISH SCHOOL BOARD, its legal successor and representative, from all liability in the premises, and from all loss or expense of any kind, incurred by the Owner, including all costs of court and all attorney's fees made necessary or arising from the failure, refusal or neglect of the Contractor to comply with the obligations assumed by Contractor; and, likewise, shall deliver all such work to the said EAST

BATON ROUGE PARISH SCHOOL BOARD free from all claims, liens and expenses, then this bond shall become null and void, otherwise, it shall remain in full force and effect.

Notice of modifications, substitutions, additions, deletions or revisions to the surety being hereby waived;

Contractor and Surety do, by act of signing the Contract and this Bond, consent and yield to the exclusive jurisdiction of the Nineteenth District Court for the Parish of East Baton Rouge, Louisiana, and do formally waive any plea of lack of jurisdiction, on account of their residence elsewhere, in the event of any legal proceeding under the Contract or this Bond.

This is a statutory bond furnished pursuant to the provisions of Louisiana Revised Statutes 38:2241 et seq.

Signed and Sealed this _____ day of _____ .

CONTRACTOR AS PRINCIPAL **SURETY**

_____ _____

Company (Corporate Seal) Company **(Corporate)**

Signature: _____ Signature: _____

_____ _____

Name and Title Name and Title

(Attach certified copy of Power of Attorney)

Address_____

_____

Telephone Number_____

SECTION 01000 - GENERAL REQUIREMENTS

A. GENERAL

1. CONTRACTOR SUBMITTALS: Prior to the approval of the Contractor's Initial Pay Application, the following shall be submitted for approval by the A/E and review by the Owner:
   a. Progress Schedule.
   b. Schedule of Values per Campus/ Facility
   c. List of ALL Subcontractors, Principal Suppliers & Fabricators, and Specialty Systems Contractors.
   d. List of Contractor's staff assignments and principal consultants.
   e. Schedule of Submittals.
   f. Copy of Building Permit.

2. PROGRESS SCHEDULE: Contractor shall submit his/her proposed Construction Progress Schedule to the Owner and the A/E at the Pre-Construction Meeting. The Schedule shall clearly identify the following:
   a. The Substantial Completion of the project within the Contract Time; include consideration for Weather Days.
   b. Shall be UPDATED concurrent with each Progress Payment Application.

3. SCHEDULE OF VALUES: Contractor shall prepare his/her Schedule of Values for each Work Line Item in accordance with the General Conditions.

4. CONTRACTOR'S INITIAL PAYMENT APPLICATION:
   a. Cover data submitted on AIA Document G702 (no substitutions) with all required information, signatures, and notarization, .Per Campus/Facility
   b. Allowed to use legible computer printouts outlining Work Line Items and Schedule of Values and Stored Materials in format similar to AIA Document G702 Continuation Sheets.
   c. Must bear A/E approval signature prior to review/approval action by the Owner.
   d. Owner will not approve for payment until all data listed in item #2 above has been submitted and approved.
   e. Payment will be made in accordance with Owner's published schedule pending timely receipt & approval action.

5. CONTRACTOR'S PROGRESS PAYMENT APPLICATIONS:
   a. Shall comply with items #4a, 4b, 4c, and 4e above.
   b. Contractor shall concurrently submit UPDATED Progress Schedules and Submittal Schedules.
   c. Shall include payment adjustments for FULLY EXECUTED Change Orders.
   d. Affidavits of major subcontractors for no claims.

6. CONTRACTOR'S FINAL PAYMENT APPLICATION:
   a. Shall comply with items #4a, 4b, 4c, and 4e above.
   b. Shall be clearly marked "FINAL".
   c. Payment will be made ONLY after satisfactory completion of all Contract Close-Out items.
   d. Payment after submission of clear lien and privilege certificate.

7. SHOP DRAWINGS & SUBMITTAL DATA:
   a. During the progress of the Work, the A/E shall promptly take action upon submittal data & provide the EBRPSS Project Manager ONE copy of each

"APPROVED" or "APPROVED AS NOTED" shop drawing, catalog data sheet, brochure, etc. as action is taken & returned to the Contractor for the Owner's information and file.

b. The A/E shall promptly advise the EBRPSS Project Manager of:
   1. Any submittal data which is delinquent to the Contractor's published Submittal Schedule, OR,
   2. Has been returned for RESUBMITTAL which could delay progress of construction.

8. PROJECT SIGN:
   a. The Contractor will be responsible for the 4' x 8'sign.

9. RECORD DOCUMENTS:
   a. Contractor shall maintain one clean set of Contract Documents at the project site for the sole purpose of identifying by date and/or authority all As-Built conditions and authorized modifications as they occur during the progress of the Work. Particularly important is the documentation of locations for underground and underslab items.
   b. Contractor shall maintain an orderly file at the project site of all "APPROVED" and "APPROVED AS NOTED" submittals, shop drawings, etc.
   c. At each site visit, the A/E shall review the Contractor's As-Built Documents to see that they are correct and current; A/E shall advise the Owner accordingly.
   d. At completion of the project, the Contractor shall transmit the on-site As-Built Documents to the A/E; the A/E shall transcribe all information to create one set of RECORD DOCUMENTS to be sent to the Owner for file.

10. CONTRACTOR CLOSE-OUT DOCUMENTS:
   a. Owner requires two complete sets in 3-ring binders.
   b. Contractor shall logically organize similar to O&M manual criteria.
   c. A/E shall review (and sign where required) prior to transmitting to the Owner for further action & file.
   d. Required documents include, but may not be limited to, originals and copies (put all originals in one notebook; put copies in the other two notebooks) of the following:
      1. Final Occupancy Certificate.
      2. General Contractor's Warranty.
      3. All Subcontractor & Specialty Contractor Warranties.
      4. All Manufacturer Warranties.
      5. All Extended (longer than 1 year) Warranties.
      6. Executed Certificate of Substantial Completion.
      7. Executed Consent of Surety.
      8. Executed Waivers of Liens.
      9. Signed-off Acknowledgements of Instruction.
      10. Signed-off Acknowledgement of Receipt of Keys.
      11. Statutory Affidavit.
      12. Non-Influence Affidavit.
      13. Valve Tag Schedule.
      14. Acknowledgement of satisfactory completion of Punch List Items
      15. No Hazardous Material Certification.
      16. Boiler Inspection Certificates from State Inspector.
      17. Elevator Inspection Certificate

13. HAZARDOUS MATERIALS:

a. Contractor shall include in the Close-Out Documents a Certification Warranty Statement that no hazardous materials (containing asbestos, PCB, etc.) were incorporated into the Work.

b. Contractor is advised that the Owner will perform post-construction verification analyses of the project to confirm the Contractor-certified absence of hazardous materials. If hazardous materials are found to exist, the Contractor shall pay ALL costs for the testing, abatement, and replacement with non-hazardous materials.

END OF SECTION

SECTION 01300
SUBMITTALS

PART ONE - GENERAL

1.01 DESCRIPTION:

A. Submittals: General term including samples, shop drawings and product data, as applicable and as defined by the General Conditions.

B. General Provisions:
1. Provisions in this section are mandatory procedures for review, approval and submitting samples, shop drawings and product data in accordance with the General Conditions.
2. Submittals which are received directly from sources other than through the General Contractor's office will be returned to the General Contractor "without action".
3. Job delays occasioned by requirement of re-submission of samples, shop drawings and product data not in accord with Contract Documents and/or submittals sequenced contrary to the agreed schedule are Contractor's responsibility, and will not be considered valid justification for extension of contract time or increase in the contract sum.

1.02 SAMPLE PREPARATION:

A. Prepare samples in sizes, shape and finish in accord with provisions of individual specification sections.

B. Samples are not to be confused with full size, on-the-site "Mock-Ups" called for in some specification sections.

C. Samples shall be submitted for the Architect's selection and approval in accordance with the Contractor's submittal schedule or sooner as needed to maintain construction progress. Approvals and color selections will not be made unilaterally where samples or selections of adjacent materials must be made for the purpose of aesthetics. Submit samples for adjacent and interrelated materials concurrently. The Owner will approve all colors before the Architect can take action.

D. The number of samples submitted shall be the number required by the Contractor, plus two (2) which will be retained by the Architect and the Owner, unless otherwise indicated.

1.03 SHOP DRAWING PREPARATION:

A. Drawing shall conform to the following requirements:
1. Number sheets consecutively.
2. Indicate working and erection dimensions and relationships to adjacent work.
3. Show arrangements and sectional views, where applicable.
4. Indicate material, gauges, thicknesses, finishes and characteristics.
5. Indicate anchoring and fastening details, including information for making connections to adjacent work.
6. Provide drawings reproducible by normal blue printing; original and prints legible
7. Indicate working and erection dimensions and relationships to adjacent work. Concurrent submittals of different aspects of work may be required

by the Architect as deemed necessary to demonstrate Contractor's ability to understand these relationships and coordinate the Work.

8. Provide 6" x 6" clean space in the lower right hand area for entry of approval stamps.
9. Cross-reference drawing details and specification paragraphs applicable to the submittal data.
10. Do not use blue-colored stamps, ink or pencil on transparencies; "Blue" is not reproducible in blueprinting.

B. Form: Submit one (1) legible sepia transparency and three (3) legible blue line prints of shop drawings.

1.04 PRODUCT DATA PREPARATION:

A. Include product manufacturer's standard printed material, dated, with product description and installation instructions indicated. Data not related to this project shall be deleted or marked "VOID" as applicable.

B. Form: Number of copies submitted shall be the number required by Contractor plus two (2) which will be retained by Architect and Owner.

C. Printed material shall be:
1. Legible.
2. Sized no larger than 8-1/2" x 11", suitable for opaque reproduction.
3. Stamped (either on a clean-area space or the reverse side) with the Contractor's approval action.

D. All submitted data shall bear the Contractor's approval action stamp plus his review notes, comments, and corrections as required.

1.05 CONTRACTOR'S REVIEW:

A. Review submittals and stamp with approval prior to submission to the Architect; Contractor's stamp shall bear the Contractor's name, the word "Approved", the signed initials of the approving agent, and the date of his approval action. By so noting, the Contractor indicates that he has reviewed and approves the materials, equipment, quantities and dimensions represented by the particular submittal.

B. Where work is indicated "By others", Contractor shall indicate responsibility for providing and coordinating such work.

C. Submissions made without Contractor's approval indicated thereon will be returned without being reviewed for compliance with this requirement.

D. Date each submittal and indicate name of Project, Architect, Contractor, Sub-Contractor, as applicable, description or name of equipment, material or product and identify location at which it is to be used in the Work. Cross-reference to specific drawing and specification references.

E. Accompany submittal with transmittal letter containing project name, Contractor's name, number of samples or drawings, titles and other pertinent data. Transmittal shall outline deviations, if any, in submittals from requirements of Contract Documents.

1.06 ARCHITECT'S REVIEW AND APPROVAL:

A. Architect's Review will be in accordance with the General Conditions.

B. Architect will return only the following submittal data to the Contractor for his further reproduction and distribution.
   1. Sepia and one (1) blueline print of shop drawings.
   2. Three (3) Copies of opaque product data.

1.07 RESUBMISSION:

A. Make corrections and changes indicated for unapproved submissions and resubmit in same manner as specified above, until Architect's approval is obtained.

B. In resubmission transmittal direct specific attention to revisions other than corrections requested by Architect on previous submissions, if any.

C. Contractor shall be responsible for bearing all costs associated with the review and approval process of resubmitted (and/or substituted) submittal data.

1.08 DISTRIBUTION:

A. Contractor is responsible for obtaining and distributing copies of submittals to his subcontractors and material suppliers after, as well as before, final approval. Prints of reviewed shop drawings shall be made from transparencies which carry the Architect's appropriate stamp.

B. Contractor shall maintain a file of approved submittals for duration of project, which shall be delivered to Owner as a part of project close-out documents.

C. The Contractor shall maintain a file of all approved submittals, bearing the Stamp of the Architect, at the project site. In the event the Architect or Owner should question the installation of any aspect of the work requiring approved submittal data, the inability of the Superintendent to produce the required approved submittal data upon demand shall constitute cause for a "stop work" order to be issued on that particular questioned aspect of the work and all relevant appurtenant work. The cause shall be equal to the Contractor's not having received required approval of the submittal data. If so issued, such "stop orders" shall not be considered valid justification for extensions of contract time and/or claims for additional monetary compensation.

1.09 SCHEDULE OF SUBMITTALS:

A. The Contractor shall, within ten (10) calendar days following award of the Contract, submit his proposed schedule of submittals to the Architect for review.

B. The purpose of the schedule is to:
   1. Demonstrate that all submittals, shop drawings, data, samples and mock-ups required for the Work are addressed by the Contractor.
   2. Demonstrate consistency with the Contractor's proposed Construction Schedule.
   3. Assist the Architect in scheduling timely review/approval action of submittals.

C. The schedule shall contain the description of the submitted item, the proposed date of submittal and the proposed date of requested return by the Architect.

D. After the Architect's receipt of the Contractor's submittal schedule, the Architect and the Contractor shall jointly review the schedule and mutually agree to acceptability or necessary modifications.

E. Contractor shall submit his final accepted schedule within five (5) calendar days after the date of the joint review.

END OF SECTION

SECTION 01312
PROJECT MEETINGS

PART 1 - GENERAL

1.01 SUMMARY

A. Project meetings:
   1. Regular meetings throughout Project life for discussion and resolution of Project issues. These meetings will be held on a frequency related to Project status, ie., weekly, bi-weekly, monthly, or others.
   2. Attendance by the Contractor, Owner, and Architect is mandatory. Architect's engineers or consultants, Contractor's subcontractors, suppliers, and others are to attend on an as-needed basis or as directed by Architect.
   3. Suggested agenda:
      a. Progress review.
      b. Schedule
      c. Submittal's status.
      d. Change Order status.
      e. RFI status
      f. Other business

B. Requirements below are intended for Contractor, subcontractors, sub-subcontractors, and material suppliers for discussion and resolution of Project specific situations. Attendance by Owner, Architect, Architect's engineers or consultants is not mandatory.
   1. Meetings between Contractor, Owner, Architect, or any combination of the three for purpose of discussing Project progress or resolving problems are delineated above.
   2. Owner and Architect may attend meetings to ascertain work is expedited consistent with Contract Documents and construction schedules.

C. Contractor requirements include:
   1. Schedule and administer preconstruction meeting, periodic progress meetings, and specially called meetings throughout work progress.
   2. Prepare agenda for meetings.
   3. Distribute written notice of each meeting four days in advance of meeting date.
   4. Make physical arrangements for meetings.
   5. Preside at meetings.
   6. Record minutes; include significant proceedings and decisions.
   7. Reproduce and distribute copies of minutes within three days after each meeting as follows:
      a. One copy to each participant in meeting.
      b. One copy to parties affected by decisions made at meeting.
      c. Three copies of minutes to Architect.
      d. One copy to Owner's representative.

D. Representatives of contractors, subcontractors, and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.

E. Related sections:
   1. Section 01310: Construction Schedules
   2. Section 01300: Submittals

F. Pre-construction meeting:
1. Schedule within 10 days after date of Notice of Award.
2. Location: Central site, convenient for all parties, designated by the Owner.
3. Attendance:
   a. Owner's Representative
   b. Architect and professional consultants.
   c. Resident Project Representative
   d. Contractor's Superintendent
   e. Major subcontractors.
   f. Major suppliers.
   g. Others, as appropriate.

4. Suggested agenda:
1. Distribution and discussion of:
   a. List of major subcontractors and suppliers.
   b. Projected Construction Schedules
2. Critical work sequencing.
3. Major equipment deliveries and priorities.
4. Project coordination: Designation of responsible personnel.
5. Procedures and processing of:
   a. Field decisions.
   b. Proposal requests.
   c. Submittals.
   d. Change Orders
   e. Applications for Payments
6. Adequacy of distribution of Contract Documents.
7. Procedures for maintaining Record Documents.
8. Use of premises:
   a. Office, work and storage areas.
   b. Owners requirements.
9. Temporary facilities, controls, and construction aids.
10. Temporary utilities.
11. Safety and first-aid procedures.
12. Security procedures.
13. Housekeeping procedures.
14. Other: _____

G. Progress meetings:
1. Schedule regular periodic meetings as required, but not less than two meetings monthly.
2. Hold called meetings as required by progress of work.
3. Meeting's locations: Project field office of Contractor.
4. Attendance:
   a. Subcontractors, as appropriate to agenda.
   b. Suppliers, as appropriate.
   c. Architect and professional consultants, as needed or required.
   d. Others.
5. Suggested agenda:
   a. Review, approval of minutes of previous meeting.
   b. Review of work in progress since previous meeting.
   c. Field observations, problems, conflicts.
   d. Problems which impede Progress Schedule
   e. Review of off-site fabrication, delivery schedules.

f. Corrective measures and procedures to regain projected schedule.
g. Revisions to Progress Schedule.
h. Progress; schedule, during succeeding work period.
i. Coordination of schedules.
j. Review submittal schedules; expedite as required.
k. Maintenance of quality standards.
l. Pending changes and substitutions.
m. Review proposed changes for effect on:
   1) Progress schedule and on completion date.
   2) Other contracts of Project.
n. Review Monthly Pay Applications
o. Other

End of Section

SECTION 01400
TESTING LABORATORY SERVICES

PART ONE - GENERAL

1.01 DESCRIPTION:

A. An independent Testing Laboratory will be provided by the Owner or his representative to inspect and test the materials and methods of construction as hereinafter specified for compliance with the specification requirements of the Contract Documents and to perform such other specialized technical services as may be required by the Owner or his representative.

B. The Owner will pay for the initial laboratory services for testing of materials for compliance with the requirements of the Contract Documents. The Contractor will pay for testing and re-testing of materials that do not comply with the requirements of the Contract Documents.

C. Tests and Inspections shall be conducted in accordance with specified requirements, and if not specified, in accordance with the applicable standards of the American Society for Testing and Materials (ASTM) or other recognized and accepted authorities in the field.

1.02 QUALIFICATION OF LABORATORY:

A. The Testing Laboratory selected should meet the basic requirements of ASTM E329 "Standard of Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction", shall be inspected and approved by the ELF, FC & PA Joint Technical Committee, Inc. or by an equivalent recognized national authority and shall submit to the Owner, Architect, and the Engineer, a copy of the report of inspection of their facilities.

B. The Testing Laboratory selected shall meet "Recommended Requirements for Independent Laboratory Qualification", latest edition, as published by the "American Council of Independent Laboratory Qualification".

C. Testing machines shall be calibrated at intervals not exceeding 12 months by devices of accuracy traceable to the National Bureau of Standards or accepted values of natural physical constants. The testing laboratory shall submit a copy of certificate of calibration made by an accredited calibration agency.

D. The Testing Laboratory is only required to have testing facilities for work included in this project

E. The agent of the Testing Laboratory performing field sampling and field testing of concrete shall be certified by the American Concrete Institute as a Concrete Field Testing Technician – Grade 1, or by an equivalent recognized national authority for an equivalent level of competence, or shall be a Licensed Professional Engineer.

1.03 AUTHORITIES AND DUTIES OF THE LABORATORY:

A. The Testing Laboratory shall obtain and review the project plans and specifications with the Architect and Engineer six (6) weeks prior to the start of construction. The Laboratory shall attend pre-construction conferences with the Architect, Engineer, Project Manager, General Contractor, and Material Suppliers, to coordinate materials inspection and testing requirements with the planned construction

schedule. The Laboratory will participate in such conferences throughout the course of the project.

B. The Testing Laboratory shall be responsible for outlining a written detailed testing program conforming to the requirements as specified in the Contract Documents and in consultation with the Owner, Architect, and Engineer. The testing program shall contain an outline of inspections and tests to be performed with reference to applicable sections of the specifications or drawings and a list of personnel assigned to each portion of the work. Such testing program shall be submitted to the Owner, Architect, and Engineer five (5) weeks in advance of the start of construction so as not to delay the start of construction. It shall be the Testing Laboratory's responsibility that such program conforms to the requirements of the Specifications and falls within the Owner's budget for testing laboratory services. If the allocated budget is not sufficient to cover the services as outlined in the Specifications, it shall be the responsibility of the Laboratory to notify the Architect, Engineer, and Owner, so the start of Laboratory services can be modified accordingly prior to the start of construction. Furthermore, the Testing Laboratory shall monitor its expenditures throughout the course of the job and notify immediately the Owner, Architect and Engineer, of any significant divination from the planned testing program and budget.

C. The Laboratory shall cooperate with the Architect, Engineer, and Contractor, and provide qualified personnel promptly on notice.

D. The Laboratory shall perform the required inspections, sampling, and testing of materials as specified under each section and observe methods of construction for compliance with the requirements of the Contract Documents.

E. The Laboratory shall notify the Architect and contractor first by telephone, and then in writing, of observed irregularities and deficiencies of the work and other conditions not in compliance with the requirements of the Contract Documents.

F. The Laboratory shall submit copies of all reports of inspections and test promptly and directly to the parties named below. All reports shall contain at least the following information:
1. Project Name
2. Date report issued.
3. Testing Laboratory name and address.
4. Name and signature of inspector.
5. Date of inspection and sampling.
6. Date of Test.
7. Identification of product and Specification section.
8. Location in the project.
9. Identification of inspection or test.
10. Record of weather conditions and temperature (if applicable).
11. Results of test regarding compliance with Contract Documents.

G. The Laboratory shall send certified copies of test and inspection reports to the following parties:
1. Two (2) copies to the Owner or his representative.
2. Two (2) copies to the General Contractor.
3. One (1) copy to the Architect.
4. One (1) copy to the Engineer of responsibility
5. One copy to the Supplier of the material tested.

H. Upon completion of the job, the Testing Laboratory shall furnish to the Owner, Architect, and Engineer of responsibility, a statement certified by a Notary Public that all required tests and inspections were made in accordance with the requirements of the Contract Documents.

I. The Testing Laboratory is not authorized to revoke, alter, relax, enlarge upon, or release any requirements of the Specifications or to approve or accept any portion of the work or to perform any duties of the General Contractor and his Subcontractors.

1.04 CONTRACTOR'S RESPONSIBILITY:

A. The Contractor shall cooperate with Laboratory personnel, provide access to the work, and to manufacturer's operations.

B. The Contractor shall provide to the Laboratory representative, samples of materials proposed for use in the work in quantities sufficient for accurate testing as specified.

C. The Contractor shall furnish casual labor, equipment, and facilities as required for sampling and testing by the Laboratory and otherwise facilitate all required inspections and tests.

D. The Contractor shall be responsible for notifying the Testing Laboratory sufficiently in advance of operations to allow for assignment of personnel and scheduling of tests.

E. The Contractor shall arrange with the Testing Laboratory and pay for any additional samples and tests above those required by the Contract Documents as requested by the Contractor for his convenience in performing the work.

F. The Contractor shall pay for any additional inspections, sampling, testing, and re-testing as required when initial tests indicate work does not comply with the requirements of the Contract Documents.

G. The Contractor shall furnish and pay for the following items:
1. Soil survey of the location of borrow soil materials, samples of existing soil materials, and delivery to the Testing Laboratory.
2. Samples of concrete aggregates and delivery to the Testing Laboratory.
3. Concrete Coring, tests of below-strength concrete, and load tests, if ordered by the Owner, Architect, and/or Engineer.
4. Certification of reinforcing steel mill order.
5. Certification of Portland cement.
6. Tests, samples, and mock-ups of substitute material where the substitution is requested by the Contractor, and the tests are necessary in the opinion of the Owner, Architect, or Engineer to establish equality with specified items.
7. Any other tests when such costs are required by the Contract Documents to be paid by the Contractor.

H. The Contractor shall be responsible for notifying the Owner, the Architect, the Engineer, and the Testing Laboratory when the source of any material is changed after the original tests or inspections have been made.

I. If in the opinion of the Owner, Architect or Engineer, any of the work of the contractor is not satisfactory, the Contractor shall make all tests that the Owner,

Architect, or Engineer deem advisable to determine its proper construction. The Owner shall pay all costs if the tests prove the questioned work to be satisfactory.

1.05 EXTENT OF SERVICES FOR EARTHWORK:

A. Moisture Density Relationship for Natural and Fill Materials:

1. The Testing Laboratory will provide one (1) optimum moisture density curve for each type of soil, natural, imported fill, or on-site fill, encountered in subgrade and fills under building slabs and paved areas. Curves shall be generated in accordance with ASTM D698.

B. Quality Control Testing Required During Construction:

1. The Testing Laboratory shall inspect and approve the following subgrades and fill layers before further construction work is performed there on:
   a. Paved Areas and Building slab Subgrade: Make at least one (1) field density test of the natural density test of the natural subgrade for every 2,500 square feet of paved area or building slab, but in no case less than three (3) tests. In each compacted fill layer, make one (1) field density test for every 2,500 square of building slab on paved area, but in no case less than three (3) tests.
   b. Foundation Wall Backfill: Make at least one (1) field density test for each 200 lineal feet of all with a minimum of four (4) tests for each basement wall around the perimeter of the building and a minimum of one (1) test for every other type of foundation wall on the site. Tests shall be at random locations and elevations for each wall.
2. Field Density Test shall be run according to ASTM D1556 (Density of Soil in Place by the Sand Cone Method), ASTM D2167) (Density of Soil in Place by the Rubber Balloon Method) or ASTM D2922 (Density of Soil and Soil Aggregate in Place by Nuclear Methods) as applicable.
3. The results of field density tests by the Testing Laboratory will not be considered satisfactory unless their value meet the required density.
4. The Testing Laboratory shall submit all moisture density curves and results of field density tests to the parties listed under Section 1.03G.
5. If reports by the Testing Laboratory indicate field densities lower than specified above, additional tests will be run by the Testing Laboratory with at least the frequencies scheduled above on re-compacted fill and/or natural subgrade. The Testing Laboratory shall notify the Contractor on a timely basis for any required re-testing so as not to delay the work. The costs of such tests shall be borne by the Contractor.
6. The Geotechnical Engineer shall provide inspection service of each dug footing subgrade prior to pouring foundation concrete. Such inspection shall verify that field conditions are consistent with soil report test results and that the foundation is being installed in the proper soil strata at the proper elevation.
   The Geotechnical Engineer shall submit written field inspection reports promptly after inspection to all parties listed in 1.3 G, and report his findings after each inspection by telephone to the Structural Engineer.

1.06 EXTENT OF SERVICE FOR CONCRETE MATERIALS AND POURED IN-PLACE CONCRETE:

A. Concrete Test Cylinders:

1. Cylinders for strength tests shall be molded and laboratory cured in accordance with ASTM C31 "Method of Making and Curing Concrete Test Cylinders in the Field" and tested in accordance with ASTM C39 "Method of Testing for Compressive Strength of Cylindrical Concrete Specimens".
2. Field samples for strength tests shall be taken in accordance with ASTM C172 "Method of Sampling Fresh Concrete".
3. Frequency of Testing: Each set of test cylinders shall consist of a minimum of four (4) standard test cylinders. A set of test cylinders shall be made according to the following frequency:
   a. One (1) set for each class of concrete taken not less than once a day.
   b. For walls and floors, one (1) set for each 100 cubic yards or fraction thereof not less than one (1) set for each 5,000 square feet of surface area.
   c. For columns, one (1) set for each 150 cubic yards or fraction thereof with a minimum of two (2) sets per floor.
   d. For all other concrete, a minimum of one (1) set for each 100 cubic yards or fraction thereof.
   e. No more than one (1) set of cylinders at a time shall be made from any single truck.
   f. If the total volume of concrete is such that the frequency of testing as specified above would provide less than five (5) strength tests for a given class of concrete, tests shall be made from at least five (5) randomly selected batches or from each batch if fewer than five batches are used.
   g. The above frequencies assume that one (1) batch plant will be used for each pour. If more than one (1) batch plant is used, the frequencies cited above shall apply for each plant used.

   The cylinders shall be numbered, dated, and the point of concrete placement in the building recorded. Of the four (4) cylinders per set, break one at seven days, two at 28 days, and one automatically at 56 days if either 28 day cylinder break is below required strength. One (1) additional cylinder per set will be required for formed slab and pan joist floors for the purpose of evaluating the concrete strength at the time of form stripping.

   The cylinder shall be stored on the floor where form removal is to occur under the same exposure conditions as the floor concrete.

   This cylinder shall be cured under field conditions in accordance with ASTM C31 "Method of Making and Curing Concrete Test Specimen in the Field". Field cured test cylinders shall be molded at the same time and from the same samples as laboratory cured test specimens. This cylinder shall be broken at the time of form removal as directed by the Contractor.
4. For concrete with design strength in excess of 5,000 PSI, the Contractor shall be responsible for providing a temperature controlled and protected concrete cylinder storage box at a point on the job site mutually agreeable with the Testing Laboratory for the purpose of storing concrete cylinders until they are transported to the Laboratory.
5. The Testing Laboratory shall be responsible for transporting the cylinders to the Laboratory in a protected environment such that no damage or ill effect will occur to the concrete cylinders.
6. The Testing Laboratory shall make and distribute concrete test reports after each job cylinder is broken. Such reports shall contain the following information:

a. Truck number and ticket number.
b. Concrete Batch Plant
c. Mix design number.
d. Accurate location of pour in the structure.
e. Strength requirement.
f. Date cylinders made and broken.
g. Technician making cylinders.
h. Concrete temperature at placing.
i. Air temperature at point of placement in the structure.
j. Amount of water added to the truck at the batch plant and at the site.
k. Slump
l. Unit weight.
m. Air Content
n. Cylinder compressive strengths with type of failure if concrete does not meet Specification requirements. Seven (7) day breaks are not to be flagged if they are less than 70% of the required 28 day strength. 28 day breaks are to be flagged if either cylinder fails to meet Specification requirements.

B. Other Tests of Concrete Required by the Testing Laboratory:
1. Slump tests (ASTM C143) shall be made at the beginning of concrete placement for each batch plant and for each set of test cylinders made.
2. Air entrainment (ASTM C233) tests shall be made at the same time slump tests are made as cited above.
3. Concrete Temperature at placment at the same time slump tests are made as cited above.

B. Evaluation and Acceptance of Concrete:
1. A strength test shall be defined as the average strength of two (2) 28-day cylinder breaks from each set of cylinders.
2. The strength level of an individual class of concrete shall be considered satisfactory if both of the following requirements are met:
   a. The average of all sets of three (3) consecutive strength tests equal or exceed the required f'c.
   b. No individual strength tests (average of two (2) 28-day cylinder breaks) fall below the required f'c by more than 500 PSI.

   If either of the above requirements is not met, the Testing Laboratory shall immediately notify the Engineer by telephone. Steps shall immediately be taken to increase the average of subsequent strength tests.

D. Investigation of Low Strength Concrete Test Results:

1. If any strength test of laboratory cured cylinders fall below the required f'c by more than 500 PSI , the Contractor shall take steps immediately to assure that the load carryng capacity of the structure is not jeopardized.
2. The Testing Laboratory shall, under the direction of the Engineer, perform non-destructive field test of the concrete in question using Swiss Hammer, Windsor Probe, or other appropriate methods and report the results the same as for cylinder test reports.
3. If the likelihood of low strength concrete is confirmed and computations indicate that the load carrying capacity of the structure has been significantly reduced, tests of cores drilled from the area in question under the direction of the Engineer will be required in accordance with ASTM

C42 (Method of Obtaining and Testing Drilled Cores and Saws Beams of Concrete). In such case, three (3) cores shall be taken for each strength test more than 500 PSI below required f'c. If concrete in the structure will be dry under service conditions, cores shall be air dried (temperature 60° to 80°, relatively humidity less than 60 percent) for seven (7) days before test and shall be tested dry. If concrete in the structure will be more than superficially wet under service conditions, cores shall be immersed in water for at least 48 hours and tested wet. The Contractor shall fill all holes made by drilling cores with an approved dry-pack concrete.

4. Concrete in an area represented by core test shall be considered structurally adequate if the average of three (3) cores is equal to at least 85% of f'c and if no single core is less than 75% of f'c. To check testing accuracy, locations of erratic core strengths may be re-tested.
5. If the above criteria are not met, and the structure adequacy remains in doubt, the Engineer may order a load test, as specified in ACI 318 for the questionable portion of the structure.
6. If the structural adequacy of the affected portion of the structure remains in doubt, the Engineer may order the structure to be strengthened by an appropriate means or torn down and re-built.
7. The costs of all investigations of low strength concrete shall be borne by the Contractor.

E. Job Site Inspection by the Testing Laboratory: The scope of the work to be perfomred by the inspector on the job site shall be as follows:

1. Verify that air temperatures at the point of placement in the structure are within acceptable limits defined in Section J prior to ordering of concrete by the Contractor.
2. Inspect concrete upon arrival to verify that the proper concrete mix number, type of concrete, and concrete strength is being placed at the proper location.
3. Inspect plastic concrete upon arrival at the job site to verify proper batching. The responsibility for adding water to trucks at the job site shall rest only with a duly appointed representative mutually agreeable to the Contractor, Owner, and Engineer, prior to the start of any concrete operations.
4. Obtain concrete test cylinders as specified in Sections D.1 and D.2.
5. Perform slump tests and air entrainment tests as specified in Section D.6.
6. Record information for concrete test reports as specified in Section D.6
7. Verify that all concrete being placed meets job Specifications. Reject concrete not meeting the requirements of Section K and immediately notify the Contractor, Batch Plant Inspector, Architect , Engineer, and Owner.
8. Pick up and transport to Laboratory, cylinders cast the previous day.
9. Check concrete placing techniques to determine that concrete deposited is uniform and that vertical drop does not exceed six feet.
10. The job site inspector shall report any irregularities that occur in the concrete at the job site or test results to the Contractor, Architect, Owner, and Engineer.

F. Causes for Rejection of Concrete Delivered to the Site:

A duly appointed representative agreeable to the Architect, Owner, and Engineer, shall reject all concrete delivered to the site for any of the following reasons:

1. Wrong class of concrete (incorrect mix design number).
2. Air Temperature: Air temperature limits shall be as follows:
   a. Cold Weather: Air temperature must be 40°F. and rising.
   b. Hot Weather: Air temperature must be cooler than 100°F.

Concrete may be placed at other air temperature ranges only with approval to the duly appointed representative.

3. Concrete with temperatures exceeding 95° F. may not be placed in the structure without approval of the job inspector for the Testing Laboratory or other duly appointed representative.
4. Air contents outside the limits specified in the mix designs.
5. Slumps outside the limits specified in Section C.6 or the mix designs.
6. Excessive Age: Concrete shall be discharged within 90 minutes of plant departure or before it begins to set if sooner than 90 minutes unless approved by the Laboratory job inspector or other duly appointed representative.

END OF SECTION

SECTION 01500
TEMPORARY FACILITIES

PART ONE - GENERAL

1.01 FACILITIES:

A. Temporary Offices: A temporary office is not required for this project.

B. Temporary Storage Facilities: Install storage and fabrication sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility service. Sheds may be open shelters of fully enclosed spaces. Locations and adequacy of storage facilities shall be subject to Architect's approval.

C. Electrical Service: Provide temporary electrical service, including extensions and connections necessary for construction work. Pay costs of installing and maintaining service for duration of project. Pay costs associated with use of permanent electrical system until Date of Substantial Completion.

D. Telephone Service: The contractor shall provide an effective and reliable means of communication between the contractor's field personnel and the Owner and Architect.

E. Water Service: Provide temporary water for construction purposes, including extensions and connections necessary for work. Pay costs of installation and maintaining service for duration of project. Pay costs associated with use of permanent water system until Date of Substantial Completion.

F. Sanitary Toilet Facilities: Provide and maintain temporary toilet facilities for construction personnel. Permanent new facilities may not be used by personnel. During work at existing facilities, under no circumstances will workmen be allowed to use any student or teacher toilet facility within the building.

G. Where work is performed with-in an existing building, water, electrical and gas will be paid for by the owner (where possible to use convenience outlets with-in the building without disturbing school operations).

H. At completion of Work, or at time of permanent utility connections, as applicable, remove temporary facilities, including connections and debris resulting from temporary installation.

1.02 STAGING AREA:

A. The Contractor shall be responsible for establishing staging areas WITHIN the designated Limit of Work area for this Contract; no staging or materials storage will be permitted outside the Limit of Work area.

B. The Contractor is solely responsible for all security, protection, safeguards, etc. of materials and personnel within the established staging area (areas).

1.03 TEMPORARY CONTROLS:

A. Noise Control: Contractor shall make every effort to effect a satisfactory noise abatement program during school hours. Use sound deadening materials where required to reduce disturbances to classroom in session.

B. Dust Control: Where cutting or removing materials which will generate dust and dirt, the Contractor shall provide temporary dust curtains, solid barricades, or the like, to retain and control dust relative to the area in which work is occurring. Clean areas of dust as practicable so as not to allow its spread by pedestrian traffic.

1.04 **CONTRACTOR'S USE OF PREMISES:** The Contractor is reminded that the Project is limited by its nature to certain physical areas of each facility. The facilities may be fully occupied (except as provided for work areas) while the work progresses. Therefore, restrict personnel to areas of each facility where their presence is required by the work to be performed. The Contractor's personnel shall not fraternize with students and school personnel.

1.05 **EXISTING BUILDING AND PARTIALLY OCCUPIED NEW BUILDING SECURITY:**

A. Contractor is responsible for operating in a manner that will maintain the security of the existing building and its contents.

B. Any temporary barriers between new work and existing must be secured with solid temporary walls.

C. Required emergency exit ways shall be maintained at all times.

D. Should the Contractor work in the existing building at times that school personnel are not present, Contractor shall be responsible for the security of the building. Before leaving, Contractor shall check all doors, windows, etc. to be certain that they are closed, locked and secure. Contractor shall leave premises in a condition to allow normal operation of school functions.

1.06 **PROJECT SIGNS:**

A. Contractor will coordinate placement with the Principal or Site Supervisor.

B. The Contractor shall provide, furnish and install project sign.

END OF SECTION

SECTION 01630
SUBSTITUTIONS

PART ONE - GENERAL

1.01 REQUIREMENTS INCLUDED: Substitutions for products specified shall be allowed only under the conditions stated in this section.

1.02 SUBSTITUTIONS/PRIOR APPROVALS:

A. If it is desired to use products different from those indicated in the Contract Documents, the party requesting the substitution shall make written application as described herein. The burden of proving equality of proposed substitutions rests on the party making the request for substitution.

Requests for substitution shall reach the Architect not less than seven (7) working days prior to the date for opening of bids. Requests received by the Architect after this date will not be considered.

1.03 SUBMITTALS:

A. Submit a separate request for each substitution. Support each request with:
1. Date of request.
2. Name of party proposing substitution.
3. Project name.
4. Specification reference.
5. Complete data substantiating compliance of proposed substitution with requirements stated in Contract Documents:
   a. Product identification, including manufacturer's name and address.
   b. Manufacturer's literature, identify:
      (1) Product description.
      (2) Reference standards.
      (3) Performance and test data.
      (4) Manufacturer's recommendations for use and installation.
   c. Samples, as applicable.
   d. Name and address of similar projects on which product has been used, and date of each installation.
6. Itemized comparison of the proposed substitution with product specified, list all variations.
7. Data relating to changes in construction schedule.
8. Any effect of substitution on separate contracts.
9. List of changes required in other work or products.
10. Designation of required license fees or royalties.
11. Designation of availability of maintenance services, sources of replacement materials.

B. If a proposed substitution is approved by the Architect, an addendum will be issued to prospective bidders not less than three (3) days prior to the date set for opening bids. If a substitution does not appear in an addendum it shall mean that the Architect has not approved the product and the successful bidder shall be responsible for furnishing materials and products in accordance with the Contract Documents. Following the receipt of bids, no further requests for substitution of products or materials will be considered.

1.04 CONTRACTOR'S REPRESENTATION: In connection with the use of any substitute item approved by the Architect it shall be the General Contractor's responsibility to see that such items meet all space requirements, and that any alterations to connecting items necessitated by use of the alternate items are properly made at no increase in cost to the Owner, and that all items are in compliance with the specification requirements. Contractor shall waive all claims for additional costs caused by substitutions which may subsequently become apparent.

END OF SECTION

SECTION 01650
PROJECT RECORD DOCUMENTS

PART ONE - GENERAL

1.01 REQUIREMENTS INCLUDED:

A. Maintain at Project Site for Owner, one (1) record copy of:
   1. Drawings.
   2. Project Manual/Specifications.
   3. Addenda.
   4. Change Orders and other Modifications to Contract.
   5. Field Orders or written instructions.
   6. Approved and Approved As Noted Shop Drawings, Product Data and Samples.
   7. Field Test Records.

B. Make Record Documents available to Architect.

C. Submit final Record Documents with Closeout Documents.

1.02 QUALITY ASSURANCE:

A. Make entries within twenty-four (24) hours after receipt of information except note dimensional corrections and new dimensional data immediately upon determination.

B. Do not permit record sets to be used for any other purpose.

1.03 RECORD DOCUMENTS:

A. Field Record Drawings: One complete set of Drawings upon which all changes to Work are recorded daily with colored pencil to provide accurate, factual information relative to Work as constructed, both visible and concealed. Entries shall be made on line prints provided by Architect with each sheet bearing rubber stamp impression reading "Record Drawings".
   1. Identify entry by "cloud" type circle around affected Work. Initial and date each entry.
   2. Record the following:
      a. Horizontal location and elevation of underground portions of Work.
      b. Location, size and arrangement of concealed mechanical and electrical portions of Work, including conduit, piping, valves, ductwork, outlets, and equipment.
      c. Location, size and arrangement of exposed mechanical and electrical portions of Work.
      d. Changes and corrections to dimensions.
      e. Changes to materials, products, equipment and finishes.
      f. Changes and deviations in Work from that indicated in Contract Documents.
      g. Identify equipment, valves, piping, conduit, fixtures and devices using symbols and designations corresponding to those used in Contract Documents.

B. Final Record Drawings: One complete set of reproducible sepia transparencies upon which all changes to Work are transferred from Field Record Drawings in ink or black

pencil. Sepia transparencies will be provided by the Architect.

C. Field Record Specifications: One complete set of Project Manual/Specifications within which changes to materials, products, equipment, and systems are recorded; also, note which specified manufacturer was used. Make corrections with colored pencil and mark the Manual "Record Specifications" on outside back binding.

D. Final Record Specifications: Either Field Record Specifications volume or new set of Specifications bearing all changes transferred from Field Record Specifications.

END OF SECTION

SECTION 01700
CONTRACT CLOSEOUT

PART ONE - GENERAL

1.01 DEFINITIONS:

Closeout is hereby defined to include the general requirements near the end of the Contract Time, in preparation for substantial completion, final acceptance, final payment, normal termination of the Contract, occupancy by the Owner and similar actions evidencing completion of the work. Specific requirements for individual units of work are specified in the sections of Division 1 through 16. The time of closeout is recognized to be directly related to "Substantial Completion", and therefore may be either a single time period for the entire work or a series of time periods for individual parts of the work which have been certified as substantially complete at different dates.

After the Contractor receives an executed copy of "A Notice of Substantial Completion" of the project, he shall prepare, assemble and transmit the documents, brochures and drawings herein required in one package to achieve Final Completion.

1.02 CERTIFICATION OF SUBSTANTIAL COMPLETION:

Prior to requesting Architect's inspection for certification of Substantial Completion (for either the entire work or portions thereof), complete the following and list all known exceptions in the request:

A. Submit last progress-payment request, with sworn statement showing 100 percent completion of the work, complete with associated releases, consents and supports.

B. Advise Owner of pending insurance changeover requirements.

C. Obtain and submit operating certificates, certificate of occupancy from governing officials, final inspection/test certificates, and similar releases enabling Owner's full and unrestricted use of the work and access to services and utilities.

D. Deliver tools, spare parts, extra stocks of materials, and similar physical items to Owner.

E. Make final changeover of locks and transmit keys to Owner, and advise Owner's personnel to changeover in security provisions.

F. Complete start-up testing of systems and instructions of Owner's operating/maintenance personnel.

G. Touch-up and otherwise repair and restore marred exposed finishes.

H. Fire Extinguishers: Leave extinguishers charged and ready for use. Extinguishers shall bear a tag showing the date tested and by whom. All costs incurred shall be borne by the Contractor.

I. Valve Tag Schedules: Furnish two (2) copies of schedules with the Close-Out Documents and mount one additional copy, framed under glass, in mechanical room.

J. A comprehensive list of the items to be completed or corrected (Punch list).

1.03 CERTIFICATION OF FINAL ACCEPTANCE: Prior to requesting Architect's final inspection for certification of final acceptance and final payment, as required by the General Conditions, complete the following and list known exceptions (if any) in request:

A. Submit final payment request with final releases and supports not previously submitted and accepted.

B. Submit record drawings, and similar final record information.

C. Submit record documents, special guarantees, warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

D. Submit copy of Architect's final punch-list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance.

E. Complete the final cleaning.

F. Submit a lien and privilege certificate from the Clerk of Court, 19th Judicial District Court, Parish of East Baton Rouge, dated at least forty-six (46) days after the date of the recording of the owner’s acceptance of the Project.

G. Submit all maintenance and operating manuals.

1.04 SUBMITTALS:

A. General: Specific requirements for submittal documents are indicated in individual Sections of these Specifications. The general requirements are indicated in this Section.

B. Warranties:

1. The words "Warranty" and "Guarantee" as used anywhere in the text of the Contract Documents shall be interchangeable and synonymous meaning "a legally binding guarantee".

2. Specific warranties do not diminish implied warranties, and shall not deprive the Owner of actions, rights and remedies otherwise available to him for the General Contractor's failure to fulfill requirements of the Contract Documents. Periods of warranties shall not be interpreted as limitations on the time in which the Owner can pursue actions, rights or remedies.

3. Coincidental product warranties, which are in conflict with the requirements of the Contract Documents, will be rejected.

4. Warranties: Refer to individual Sections for requirements. (Submit on Form attached.)

5. All warranties shall commence on the date of Substantial Completion of Work or designated portion thereof or the date the maintenance and operating manuals are submitted, whichever date is the latest.

6. All warranties shall cover all costs for necessary material and labor to promptly replace or restore the failing unit of work and other work damaged from its failure.

C. Statutory and Non-Influence Affidavits (General Contractor and Subcontractor): Before final acceptance of the Work, the General Contractor shall furnish Statutory and Non-Influence Affidavits on the forms attached.

D. Inspection Reports: Secure and submit to the Owner, through the Architect, a certification from the local governmental agency or agencies that the construction has been inspected as required by laws or ordinances and that the building is acceptable for occupancy. (Certificate of Occupancy)

E. Certificate of Substantial Completion and Certificate of Final Completion: A Certificate of Substantial Completion on AIA Form No. G704, for the project will be prepared by the Architect for the purpose of establishing a date when the project is substantially complete, identification of a punch list and determining actual damages or liquidated damages.

F. Thereafter, the Owner will issue a Notice of Acceptance, which the Contractor shall immediately record with the Clerk of Court for the 19th Judicial District Court, Parish of East Baton Rouge, Louisiana and provide the recording information to the Architect and the Owner.

G. Submit a Certificate of Final Completion on final inspection of the project verifying that punch list items are complete and all closing documents are in order, as shown by the accompanying project close-out check off list, and that all final payments are in order and establishing a date of final acceptance.

H. Record Documents and As-Built Record Drawings: (Refer to Section 01650) Submit three (3) copies of each.

I. As-Built Storm water Detention Facility: On projects incorporating new or modified detention facilities, the Contractor shall secure the Engineer's Certificate, executed on the form attached to this Section, and submit triplicate copies thereof to the Architect prior to the Architect's issuance of the Substantial Completion Certificate.

J. Maintenance Manuals: Organize maintenance and operating manual information into suitable sets of manageable sizes, and bind into individual binders identified and indexed (thumb-tabbed); examples: Air Conditioning Equipment Maintenance, Roof Maintenance. Include emergency instructions, spare part listing, warranties, guarantees, wiring diagrams, recommended "turn-around" cycles, inspection procedures, shop drawings, product data, and similar applicable information. Bind each manual of each set in a heavy duty 3-ring vinyl-covered binder and include pocket folders for folded sheet information. Legibly mark identification on both the front and spine of each binder.

PART TWO - PRODUCTS: There are no products in this Section.

PART THREE - EXECUTION

3.01 CLOSEOUT PROCEDURES

A. General Maintenance Instructions: Prior to requesting Architect's inspection for certification of Substantial Completion, arrange for each installer of work requiring maintenance (by the Owner) or operation, to meet with the Owner's personnel, in the Architect's presence, at the project site, to provide basic instructions needed for proper operation and maintenance of the entire Work. Include instructions by manufacturer's representatives where installers are not expert in the required procedures. Review maintenance manuals, record documentation, tools, spare parts and materials, lubricants, and similar shut-down, emergency operations, noise and vibration adjustments, safety, economy/efficiency adjustments, and similar operations. Review maintenance and operations in relation with applicable guarantees, warranties, agreements to maintain, bonds, and similar continuing commitments.

B. Listing of Instructions: See "Acknowledgement of Instruction" form at the end of this section. Fill-out one form for each of the items, and submit in **TRIPLICATE** with Close-Out Documents. Specifically, but not necessarily by way of limitation, provide instruction to Owner's personnel on the following categories of Work:
1. Builders Hardware
2. Cleaning & Care of Hard Tile Surfaces
3. Cleaning & Care of Resilient Floor and Base
4. Cleaning & Care of Carpet
5. Cleaning & Care of Painted Surfaces
6. Operation of Fire Extinguishers
7. Food Service Equipment
8. Walk-in Cooler & Freezer
9. Rooftop HVAC Systems
10. Fans
11. HVAC Controls
12. Plumbing Fixtures
13. Water Heaters
14. Motor Starters
15. Fire Dampers
16. Lighting Fixtures
17. Fire Alarm System
18. Burglar Alarm System
19. Intercom System
20. Master Television System
21. Emergency Generator
22. Electric Heat Units
23. Kitchen Fire Suppression System
24. Elevator

C. Keys: Transmit keys, except construction master keys directly to Owner from hardware supplier. Hardware supplier shall index, tag and place keys in key cabinet (when applicable) as described below. Secure from the Owner or his designated agent a signed receipt in **TRIPLICATE** acknowledging receipt of keys and key schedule. Retain one (1) copy and forward two (2) copies of receipt to Architect.
1. Keys shall be tagged, indexed and submitted to the Owner. Keys shall be tagged as follows: One key (record key) for each lock or lockset shall be placed on a numbered tag having a non-opening clip. The remaining

key(s) (Use Keys) for the lock or lockset shall be placed on a numbered tag board having the same number as the tag for the Record Key, both numbered tags containing the keys shall then be placed on the corresponding numbered hook in the key cabinet if sufficient capacity exists. If not, bag and turn over to Owner. Record Key tags shall be hexagonal shaped, red in color, with numbers embossed in white. Use key tags shall be trilobal in shape, white in color, with numbers embossed in black.

2. Contractor shall provide Owner with an index (by tag number) in sequential order giving a description of the location of the lock or lockset that the corresponding key operates, additionally, the Contractor shall provide the Owner with index (by Key number) in sequential order giving a description of the location of the lock or lockset that the corresponding key operates. Indexes shall be typed and on the forms furnished with the key cabinet for each type index required. If no forms are furnished with the key cabinet, Contractor may use 20-weight bond paper for typing indexes.

3.02 FINAL CLEANING

A. General: Special cleaning for specific units of work is specified in the Sections of Division 2 through 16.

B. Provide final cleaning of the Work, at the time indicated, consisting of cleaning each surface or unit of work to the normal "clean" condition expected for a first-class building cleaning and maintenance program. Comply with manufacturers instructions for cleaning operations. The following are examples, but not by way of limitation, of the cleaning levels required:

1. Remove labels which are not required as permanent labels.
2. Clean transparent materials, including mirrors and window/door glass, to a polished condition, removing substances that are noticeable as vision-obscuring materials. Replace broken glass.
3. Clean exposed exterior and interior hard-surfaced finishes, including metals, masonry, concrete, painted surfaces, plastics, tile, wood, special coatings, and similar surfaces, to a dirt free condition, free of dust, stains, films and similar noticeable distracting substances. Except as otherwise indicated, avoid the disturbance of natural weathering of exterior surfaces. Restore reflective surfaces to original reflective condition.
4. Wipe surfaces of mechanical and electrical equipment clean, including equipment in addition to that specified in Division 15 and 16; remove excess lubrication and other substances.
5. Remove debris and surface dust from limited-access spaces including roofs, plenums shafts, trenches, equipment vaults, manholes, attics and similar spaces.
6. Clean concrete floors in non-occupied spaces broom clean.
7. Vacuum clean carpeted surfaces and similar soft surfaces.
8. Clean plumbing fixtures to a sanitary condition, free of stains including those resulting from water exposure.
9. Clean light fixtures and lamps so as to function with full efficiency.
10. Clean project site (yard and grounds), including landscape, development areas, of litter and foreign substances. Sweep paved areas to a broom-clean condition; remove stains, petro-chemical spills and other foreign deposits. Rake grounds clean of all debris that accumulated as a result of the construction.

C. Time of Final Cleaning: Following Architect's certification of "Substantial Completion", and immediately before his "Final Acceptance" inspection.

D. Removal of Protection:
   1. Except as otherwise indicated or requested by the Architect, remove temporary protection devices and facilities which were installed during the course of the work to protect previously completed work or hazardous conditions during the remainder of the construction period.
   2. Temporary silt fence and erosion control devices shall remain in place until one year following Substantial Completion, after which date they shall be removed by the Contractor and the surrounding areas dressed up as required.

E. Compliances: Comply with safety standards and governing regulations for cleaning operations. Do not burn waste materials at the site, or bury debris or excess materials on the Owner's property, or discharge volatile or other harmful or dangerous materials into drainage systems; remove waste materials from the site and dispose of in a lawful manner satisfactory to East Baton Rouge Parish School System's solid waste disposal ordinance. Where extra materials of value remaining after completion of the associated work have become the Owner's property, dispose of these to Owner's best advantage as directed.

3.03 **CONTINUING INSPECTIONS:** Except as otherwise required by special guarantees, warranties, agreements to maintain, workmanship bonds, and similar continuing commitments, comply with the Owner's requests to participate in inspections at the end of each time period of such continuing commitments**. Participate in the general inspection(s) of the work during the one-year period for correction after the date(s) of Substantial Completion.**

PROJECT CLOSEOUT
CHECK-OFF LIST

DOCUMENT	NO. OF COPIES	DATE RECEIVED
1. Special Extended Warranties beyond 1 year	_____	_____
2. Statutory Affidavit	_____	_____
3. Non-Influence Affidavit	_____	_____
4. Certificate of Occupancy	_____	_____
5. As-Built Drawings and Record Documents	_____	_____
6. Maintenance Manuals & Equipment Brochures		
a. Air Conditioning Equipment	_____	_____
b. Electrical Equipment	_____	_____
c. Test and Balance Report	_____	_____
d. Wiring and Controls	_____	_____
e. Diagrams for Equipment	_____	_____
7. Board of Education Maintenance		
a. Staff Instructions	_____	_____
8. Keys		
a. Schedule as specified	_____	_____
b. Certificate of receipt of keys	_____	_____
9. Schedule of valve tags, location and function	_____	_____
10. Punch list items completed	_____	_____
11. Hazardous Materials Certificate	_____	_____
12. Engineers Certificate (As-Built Stormwater Detention Facility)	_____	_____
13. Certificate of Substantial Completion AIA G704	_____	_____
14. Record Owner's Notice of Acceptance	_____	_____
15. Consent of Surety to Final Payment, AIA G707	_____	_____
16. Contractors Affidavit of Payment of Debts and Claims AIA G704*	_____	_____
17. Certificate of Final Completion**	_____	_____
18. Certificate from Clerk of Court Status of Liens & Privileges Recorded	_____	_____
19. Certificate of Final Payment to Contractor	_____	_____

* Submit following Owner's acceptance of building for use.

** Hold all other documents and submit in a package when all requirements are complete. (No exceptions; piecemeal submittals will be returned.)

I certify that, being familiar with the Contract Documents for this project, to the best of my knowledge, the items checked off herein above constitute all that are applicable to this project.

_____	_____
Contractor's Signature (For Submitting to the Architect)	Date Submitted to the Architect
_____	_____
Architect's Signature (For Submitting to the Owner)	Date Submitted to the Owner

SPECIAL EXTENDED WARRANTY

OWNER: EAST BATON ROUGE PARISH SCHOOL BOARD

PROJECT NAME: _____

PROJECT NO.: _____

PROJECT ADDRESS: _____

PARISH OF: **EAST BATON ROUGE** **STATE OF: LOUISIANA**

DATE: _____

_____,
(Insert name of PRIME WARRANTOR above and circle appropriate source below)
as (SUPPLIER) (MANUFACTURER) (SUBCONTRACTOR) on the above referenced project for:

_____
(Insert description of work or materials provided on the line above)
and the General Contractor (co-signed below) do hereby guarantee that the above executed under the criteria of the Contract Drawings and Specifications will be free of defects in material and workmanship for a period of:____ **YEARS**

beginning _____, and ending _____
(Substantial Completion Date)
and that all defects occurring within the above warranty period shall be promptly replaced or repaired at no cost to the Owner.

This warranty covers all work as shown on the Contract Drawings and Contract Specifications with warranty criteria outlined in

Specification Section Paragraph _____
(Insert the Technical Specification Section and Paragraph requiring the warranty)

Nothing in the above shall be deemed to imply that this warranty shall apply to any work or materials which has been abused or neglected by the Owner.

Legal name of Prime Warrantor	Legal name of General Contractor
By (Officer)	By (Officer)
Title	Title

Notary Public

This _____ day of _____, 20__.

STATUTORY AFFIDAVIT

STATE OF LOUISIANA, PARISH OF _____

FROM: _____
(Contractor)

TO: East Baton Rouge Parish School Board, Owner

RE: Contract entered into the _____ day of _____, 20___, between the above mentioned parties for the construction of a _____
_____
at_____
_____.

KNOW ALL MEN BY THESE PRESENTS:

1. The undersigned hereby certifies that all work required under the above contract has been performed in accordance with the terms thereof, that all materialmen, subcontractors, mechanics, and laborers have been paid and satisfied in full and that there are no outstanding claims of any character arising out of the performance of the contract which have not been paid and satisfied in full.
2. The undersigned further certifies that to the best of his knowledge and belief there are no unsatisfied claims for damages resulting from injury or death to any employees, subcontractors, or the public at large arising out of the performance of the contract, or any suits or claims for any other damage of any kind, nature, or description which might constitute a lien upon the property of the Owner.
3. The undersigned makes this affidavit as provided by law and for the purpose of receiving final payment in full settlement of all claims arising under or by virtue of the contract, and acceptance of such payment is acknowledged as a release of the Owner from any and all claims under or by virtue of the contract.

IN WITNESS WHEREOF, the undersigned has signed and sealed this instrument the _____ day of

_____, 20____.
_____

Personally appeared before the undersigned, _____
and _____ who after being duly sworn,
depose(s) and say(s) that the facts stated in the above affidavit are true.

_____
Notary Public

The _____ day of _____, 20_____.

My commission expires _____Parish, La

NON-INFLUENCE AFFIDAVIT

PARISH OF: _____

STATE _____

I do solemnly swear on my oath that as to the contract dated

, 20____, for

_____
School/Project Project No.

between

_____

and the East Baton Rouge Parish School System, I have no knowledge of the exertion of any influence or the attempted exertion of any influence on the firm on behalf of which this affidavit is made in any way, manner, or form in the purchase of materials, equipment, or other items involved in the construction, manufacture or employment of labor under the aforesaid contract, by any member of the State Board of Education, or any employee of the State Board of Education, or any member of the Local Board of Education, or any employee of the Local School District, or any person connected with the State Government of Louisiana in any way whatsoever.

This _____ day of _____ 20___.

_____
Name (Typed or Legibly Printed)

_____
Signature

_____
Title

_____
Firm

Parish of _____

State of _____

Personally before me, the undersigned, appeared

_____,
who is known to me to be an official of the firm of

_____
who, after being duly sworn, stated on his oath that he had read the above statement and that the same is true and correct.

_____
Notary Public

My commission expires _____.

This _____ day of _____ 20___.

ACKNOWLEDGEMENT OF INSTRUCTION

PROJECT NAME: _____

CSRS/TFG PROJECT NO.: _____

CONTRACTOR NAME: _____

CONTRACTOR ADDRESS: _____

OWNER: East Baton Rouge Parish School Board
2875 Michelli Dr.
Baton Rouge, La. 70805

By signature below, the Owner and the Contractor each acknowledge that the Contractor (and/or his representative) has satisfactorily instructed the Owner in the use, operation, and maintenance of:

_____

_____

DATE: _____

CONTRACTOR'S INSTRUCTING PERSONNEL: (All names legibly printed)

_____

_____

_____

OWNER'S PERSONNEL INSTRUCTED: (All names legibly printed)

_____

_____

_____

*See individual entries in paragraph 3.1.2 of this section and legibly enter here.

_____

HAZARDOUS MATERIALS CERTIFICATE

CERTIFICATE OF GENERAL CONTRACTOR

OWNER: _____

PROJECT NAME: _____

ADDRESS: _____

PARISH OF EAST BATON ROUGE

STATE OF LOUISIANA

DATE: _____

_____, as General Contractor on the above job, does hereby certify that all materials, products and assemblies supplied and installed in this project and on the site are totally free of asbestos, PCB or other hazardous materials.

This certificate covers all materials required by the contract documents.

Nothing in the above shall be deemed to imply that this certificate shall apply to materials furnished by the Owner or installed by the Owner.

LEGAL NAME OF CONTRACTOR:

BY: _____

TITLE: _____

NOTARY PUBLIC

THIS _____ **DAY OF** _____, **20** **.**

My commission expires _____

EAST BATON ROUGE PARISH SCHOOL SYSTEM

ENGINEER'S CERTIFICATE
AS-BUILT STORMWATER DETENTION FACILITY

I_____, a registered Professional Engineer in the State of Louisiana, hereby certify that the stormwater detention facility (facilities) for the project known as

_____
(School Name)

lying in Land Log _____ of the _____

Parish, East Baton Rouge, has (have) been constructed to approved plans and specifications and in accordance with East Baton Rouge Parish requirements.

This is the _____ day of _____, 20 .

_____

Louisiana Registration No. _____

THIS SECTION TO BE FILLED IN BY CLERK OF COURT

RECORDING INFORMATION OF ACCEPTANCE

_____ _____ _____
DATE OF RECORDATION ORIG. BDLE.

NOTICE BY OWNER OF ACCEPTANCE OF WORK

TO ALL WHOM IT MAY CONCERN, and especially to all Subcontractors, workmen, laborers, mechanics, and furnishers of materials. Public Notice is hereby given, according to Law, that the undersigned Owner has accepted the work done by _____, the Contractor, under a Contract with him of date _____ and recorded in Original _____, Bundle _____ of the mortgage records of the Parish of East Baton Rouge, such Contract being entitled _____
_
_____
_____
_____ All Subcontractors, workmen, laborers, mechanics, and furnishers of materials must assert whatever claim they may have against the said Contractor, growing out of the execution of said Contract, according to law, within forty-five (45) days from registration hereof.

EAST BATON ROUGE PARISH SCHOOL BOARD

BY: _____
Dr Jacqueline Mims, President

Date: _____

CERTIFICATE OF FINAL COMPLETION

PROJECT NAME: _____

PROJECT NO.: _____

DATE OF CONTRACT: _____

DATE OF THIS CERTIFICATE: _____

SOURCE OF FUNDS: _____

CONTRACTOR (Name, Address)

_____

_____

_____

TO: (OWNER)
EAST BATON ROUGE PARISH SCHOOL BOARD
2875 Michelli Dr.
Baton Rouge, La. 70805

THIS CERTIFICATE COVERS THE ENTIRE PROJECT

By execution of this document, the Contractor and Architect each certify that the work performed under this Contract has been reviewed at a final inspection on _____ and found to be complete as certified by the attached project close-out check off list, and the Owner accepts the project as complete on the lst date of this certificate. A clear lien and privilege certificate from the Clerk of Court for the 19th Judicial District Court is dated at least 46 days after the recording of the Owner's Notice of Acceptance and is attached. Final payment to the Contractor is authorized. Execution and acceptance of this certificate by the Owner, shall in no way waive or void any conditions of the Contract Documents.

A Certificate of Substantial Completion has been issued establishing _____ as the date of occupancy and the commencement of all Warranties and Guarantees required by the Contract Documents. The Owner assumed responsibility for insurance, utilities and routine maintenance as of _____.

ARCHITECT BY DATE_____ _____

CONTRACTOR BY DATE_____ _____

East Baton Rouge Parish School Board _____ _____
OWNER BY DATE

END OF SECTION

SECTION 02105 - STORMWATER POLLUTION PREVENTION PLAN

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 work consists of construction and maintenance of erosion control and management control features as described in these Drawings and Specifications for the clearing and grading of the proposed site.

B. The Stormwater Pollution Prevention Plan includes:
1. Certification of Compliance
2. LPDES Notice of Intent (NOI)
3. Erosion and Sediment Controls
4. Other Controls
5. Stormwater Management Controls
6. Inspection and Maintenance of Controls
7. Records of Construction Activities
8. LPDES Notice of Termination (NOT).

C. Related Sections include the following:

1. Division 1 Section "Field Engineering" for verifying utility locations and for recording field measurements.
2. Division 1 Section "Construction Facilities and Temporary Controls" for temporary utilities, temporary construction and support facilities, temporary security and protection facilities, and environmental protection measures during site operations.
3. Division 2 Section "Earthwork" for excavation in borrow areas and stockpiling materials, removal of unsuitable material and for foundation preparation and construction of embankments and other incidental earthwork.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Erosion and Sediment Controls

1. Temporary Seeding: Temporary seeding shall be in accordance with Section 717 of the Louisiana Standard Specifications for Roads and Bridges, 1992 Edition.
2. Fertilizer: Fertilizer shall be in accordance with Section 718 of the Louisiana Standard Specifications for Roads and Bridges, 1992 Edition.
3. Mulch: Mulch shall be in accordance with Section 1018.19 of the Louisiana Standard Specifications for Roads and Bridges, 1992 Edition.
4. Silt Fencing: Silt fencing shall be in accordance with Section 204.03(e) of the Louisiana Standard Specifications for Roads and Bridges, 1992 Edition.

5. Hay Bales: Bales shall be made of grasses suitable for baling and tightly baled with wire ties. Hay bales shall be secured in place with a minimum of two wooden stakes as indicated.

B. Other Controls

1. Stabilized Construction Entrance: Stabilized construction entrance shall be of limestone material conforming to Section 1003.04(a) of the Louisiana Standard Specifications for Roads and Bridges, 1992 Edition.

PART 3 - EXECUTION

3.1 PREPARATION

A. Certification of Compliance):

1. Contractor and Sub-Contractors shall sign the Certification of Compliance included with this specification and submit to the Environmental Division of the Department of Public Works, City of Baton Rouge. (Copy provided herein.)

B. LPDES Notice of Intent (NOI):

1. Contractor shall complete and submit the “LPDES Notice of Intent (NOI) to Discharge Stormwater Associated with Construction Activity” to the State of Louisiana - Department of Environmental Quality, Certified Mail. A copy of this document, with copy of certified mail receipt, shall also be submitted to the Environmental Division of the Department of Public Works, City of Baton Rouge. (Copy provided herein.)

C. LPDES Notice of Termination (NOT):

1. Contractor shall complete and submit the “LPDES Notice of Termination (NOT) of Coverage Under LPDES General Permit for Stormwater Discharges Associated with Construction Activity” to the State of Louisiana - Department of Environmental Quality, Certified Mail. A copy of this document, with copy of certified mail receipt, shall also be submitted to the Environmental Division of the Department of Public Works, City of Baton Rouge. (Copy provided herein.)

3.2 FIELD PROCEDURES

A. Erosion and Sediment Controls:

1. Erosion and Sediment Controls for this project will include temporary seeding (and mulching where required) of all disturbed areas, silt fencing and check dams as indicated. These measures are to be used for erosion and sediment controls throughout the time of construction. Temporary seeding and fertilizer shall be executed in accordance with Sections 717 and 718, respectively, of the Louisiana Standard Specifications for Roads and Bridges, 1992 Edition. Silt fencing and check dams shall be executed in accordance with Section 204.07 of the Louisiana Standard Specifications for Roads and Bridges, 1992 Edition. Locate and clearly flag trees and vegetation to remain or to be relocated.

2. Perimeter silt fencing shall be erected immediately and prior to any clearing and grading activities. Construction of controls and stabilization measures shall be by personnel experienced and/or adequately trained in this type of installation.

3. Controls shall be constructed and the stabilization measures applied in the order indicated on the Drawing. Construction of controls and stabilization measures shall be by personnel experienced and/or adequately trained in this type of installation.

B. Other Controls:

1. In addition to erosion and sediment controls, the Contractor shall be responsible in addressing other potential pollutant sources on the construction site, which may include compliance with applicable State and City-Parish waste disposal, control of offsite vehicle tracking, and control of dust generated by construction activities. A stabilized construction entrance shall be installed as indicated.

C. Inspection and Maintenance of Controls:

1. Contractor shall inspect controls every 7 days or within 24 hours of a storm of 0.5 inches in depth. All disturbed areas of the site, areas of material storage, and all of the erosion and sediment controls should be inspected. Controls must be in good operating condition until the area they protect has been completely stabilized and the construction activity is complete.
2. During each inspection, the contractor should complete the stabilization or structural measures inspection report form, included in this specification and note any damages or deficiencies

D. Records of Construction Activities:

1. Contractor shall keep records of the construction activity on-site. Records shall include, but not limited to:
   a. All completed inspection report forms.
   b. Dates of major grading activities in all areas of the site.
   c. Dates of stabilization of all areas of the site
2. A copy of the Stormwater Pollution Prevention Plan must be kept at the construction site from the time construction begins until the site is finally stabilized.
3. The contractor shall retain copies of the Stormwater Pollution Prevention Plan and all other reports required by the permit, as well as all of the data used to complete the NOI for 3 years after the completion of final site stabilization.

E. <u>Report Releases of Reportable Quantities</u>:

1. Contractor shall have the responsibility to report spills of hazardous substances in amounts that equal or exceed Reportable Quantity (RQ) levels in accordance with EPA regulations (40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302). If there is a RQ release during the construction period, the contractor must take the following minimum steps:
   a. Notify the National Response Center immediately at (800) 424-8802.
   b. Submit a written description of the release to the EPA Regional Office providing the date and circumstances of the release and the steps to be taken to prevent another release.

END OF SECTION 02105

Inspection Report (Page 1 of 2)

Scope of the Inspection

Examination Personnel	
Name	**Title**

Area(s) Exposed to Precipitation (Disturbed Areas, Material Storage Areas, etc.)	Describe Evidence of, or the Potential for, Pollutants Entering the Drainage System

Erosion and Sediment Control Measures	Date of Implementation (mm-dd-yy)	Operating Correctly (Yes / No)	Comments, Recommendations, and Actions Taken

Discharge Location(s) / Point(s)	Are Erosion Control Measures Effective in Preventing Significant Impacts to Receiving Waters

Location(s) Where Vehicles Enter/Exit the Site	Describe Evidence of Off-Site Sediment Tracking

Inspection Report (Page 2 of 2)

Changes Required to the SWPPP
Note: SWPPP shall be revised within 7 calendar days following the inspection.

Site Description:

Storm Water Control Measures:

Schedule to Implement Change
Note: SWPPP revision(s) shall be implemented within 7 calendar days following the inspection.

Incidents of Non-Compliance

☐ **Yes** ☐ **No** **Is the Facility in Compliance with this SWPPP and Permit No. LAR100000?**

If "No", then Identify any Incidents of Non-Compliance:

Certification (Permit No. LAR100000, Part VI.G)

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Signature: _____ **Date:** _____

Name (Print): _____ **Phone Number:** _____

Title: _____

(Date)

Department of Culture, Recreation and Tourism
1051 North 3rd Street, Room 405
Baton Rouge, LA 70802
Phone: (225) 342-8170
Fax: (225) 342-4480

Attention: Mrs. Rachel Watson

RE: ***Project Name; Section, Township-Range; Parish, City, State***

Dear Mrs. Watson:

As per the Louisiana Pollutant Discharge Elimination System (LPDES) Storm Water General Permit for Construction Activities (Permit No. LAR100000), please review the attached General Location Map and Site Map drawings for the following:

1) Determine whether the storm water discharges or storm water discharge-related activities from the construction site would have an effect on a property that is listed or eligible for listing under the National Historic Register.

<u>Project Description:</u>

(Describe the nature of construction activity.)

Very truly yours,

_____

(Name)
(Title)

Record of Major Grading Activities

Date(s) When Major Grading Activities Occur (mm-dd-yy)	Describe Major Grading Activity

Record of Temporarily or Permanently Ceased Construction Activities

Date(s) When Construction Activities Temporarily or Permanently Cease on a Portion of the Site (mm-dd-yy to mm-dd-yy)	Describe the Temporarily or Permanently Ceased Construction Activity and Location

Record of Stabilization Measures

Date(s) When Stabilization Measures are Initiated (mm-dd-yy)	Describe Stabilization Measures

(Date)

Fish and Wildlife Service
646 Cajundome Blvd.
Suite 400
Lafayette, LA 70506
(337) 291-3124

Attention: Mrs. Debbie Fuller

RE: ***Project Name; Section, Township-Range; Parish, City, State***

Dear Mrs. Fuller:

As per Addendum A, "Endangered Species Guidance" of the Louisiana Pollutant Discharge Elimination System (LPDES) Storm Water General Permit for Construction Activities (Permit No. LAR100000), please review the attached "*General Location Map, Site Map, and/or Permit Drawings*" for the following:

1) Determine if the construction site or associated storm water discharges are within the vicinity of federally listed threatened or endangered species, or their designated critical habitat.

2) Determine if any species may be found "in proximity" to the construction activity's storm water discharges.

   Note: A species is in proximity to a construction activity's storm water discharge when the species is:
   - Located in the path or immediate area through which or over which contaminated point source storm water flows from construction activities to the point of discharge into the receiving water;
   - Located in the immediate vicinity of, or nearby, the point of discharge into receiving waters; or
   - Located in the area of a site where storm water Best Management Practices (BMPs) are planned or are to be constructed.

Note: The "Endangered Species Guidance Parish/Species List" (updated through *March 7, 2002*) depicts the following federally listed or proposed U.S. species located in *name* Parish, Louisiana:

Parish	Group Name	Inventory Name	Scientific Name

Project Description:

(Describe the nature of construction activity.)

Should you have any questions concerning this matter, please feel free to contact me.

Very truly yours,

(Signature)

(Name)
(Title)

(Date)

National Marine Fisheries Service
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702
(727) 570-5301

Attention: Mr. Eric Hawk

RE: ***Project Name; Section, Township-Range; Parish, City, State***

Dear Mr. Hawk:

As per Addendum A, "Endangered Species Guidance" of the Louisiana Pollutant Discharge Elimination System (LPDES) Storm Water General Permit for Construction Activities (Permit No. LAR100000), please review the attached "*General Location Map, Site Map, and/or Permit Drawings*" for the following:

1) Determine if the construction site or associated storm water discharges are within the vicinity of federally listed threatened or endangered species, or their designated critical habitat.

2) Determine if any species may be found "in proximity" to the construction activity's storm water discharges.

   Note: A species is in proximity to a construction activity's storm water discharge when the species is:
   - Located in the path or immediate area through which or over which contaminated point source storm water flows from construction activities to the point of discharge into the receiving water;
   - Located in the immediate vicinity of, or nearby, the point of discharge into receiving waters; or
   - Located in the area of a site where storm water Best Management Practices (BMPs) are planned or are to be constructed.

Note: The "Endangered Species Guidance Parish/Species List" (updated through *March 7, 2002*) depicts the following federally listed or proposed U.S. species located in *name* Parish, Louisiana:

Parish	Group Name	Inventory Name	Scientific Name

Project Description:

(Describe the nature of construction activity.)

Should you have any questions concerning this matter, please feel free to contact me.

Very truly yours,

(Signature)

(Name)
(Title)

SECTION 02200 - EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

A. This section includes the following:

1. Extent of earthwork is indicated on drawings:
   a. Preparation of subgrade for building slabs, walks, and pavements is included as part of this work.
   b. Drainage fill course for support of building slabs is included as part of this work.
   c. Backfilling of trenches within building lines is included as part of this work.

B. Excavation for Mechanical/Electrical Work: Refer to Divisions 15 and 16 sections for excavation and backfill required in conjunction with underground mechanical and electrical utilities, and buried mechanical and electrical appurtenances; not work of this section.

C. Definition: "Excavation" consists of removal of material encountered to subgrade elevations indicated and subsequent disposal of materials removed.

1.2 SUBMITTALS

A. Test Reports-Excavating: Submit following reports directly to Architect/Engineer from the testing services, with copy to Contractor:
1. Test reports on borrow material.
2. Field density test reports.
3. One optimum moisture-maximum density curve for each type of soil encountered.

1.3 QUALITY ASSURANCE

A. Codes and Standards: Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

B. Testing & Inspection Service: Owner shall engage and pay for soil testing and inspection service for quality control testing during earthwork operations. Contractor shall pay for all retesting of failed tests.

1.4 PROJECT/SITE CONDITIONS

A. Site Information: Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. It is expressly understood that Owner will not be responsible for interpretations or conclusions drawn therefrom by Contractor. Data is made available for convenience of Contractor. Geotechnical Report may be reviewed at Architect's office.

B. Additional test borings and other exploratory operations may be made by Contractor at no cost to Owner.

C. Existing Utilities: Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations.

D. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

E. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, during occupied hours, except when permitted in writing by Architect/Engineer and then only after acceptable temporary utility services have been provided.

1. Provide minimum of 48-hour notice to Architect/Engineer, and receive written notice to proceed before interrupting any utility.

F. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off of services if lines are active.

G. Use of Explosives: The use of explosives is not permitted.

H. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights.

I. Operate warning lights as recommended by authorities having jurisdiction.

J. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

1. Excavations within drip-line of large trees to be done by hand. Protect the root system from damage or dryout to the greatest extent possible. Maintain moist condition for root system and cover exposed roots with burlap. Paint root cuts of 1" diameter and larger with emulsified asphalt tree paint.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. Soil material for fill shall be a low plasticity clay with a maximum Liquid Limit of 40.

B. Definitions:

1. Sub-base Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, crushed slag, natural or crushed sand.
2. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, or crushed on site concrete, with 100% passing a 1-1/2" sieve and not more than 5% passing a No. 4 sieve.
3. Backfill and Fill Materials: Satisfactory soil materials free of clay, rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.

PART 3 EXECUTION

3.1 EXCAVATION

A. Excavation is Unclassified, and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.

B. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of Architect/Engineer. Unauthorized excavation, as well as remedial work directed by Architect, shall be at Contractor's expense.

C. Under footings, foundation bases, or retaining walls, fill unauthorized excavation by extending indicated bottom elevation of footing or base to excavation bottom, without altering required top elevation. Lean concrete fill may be used to bring elevations to proper position, when acceptable to Architect/Engineer.

D. Elsewhere, backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by Architect/Engineer.

E. Additional Excavation: When excavation has reached required subgrade elevations, notify Architect/Engineer who will make an inspection of conditions.

F. If unsuitable bearing materials are encountered at required subgrade elevations, carry excavations deeper and replace excavated material as directed by Architect/Engineer.

G. Removal of unsuitable material and its replacement as directed will be paid on basis of contract conditions relative to changes in work.

H. Stability of Excavations: Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated.

I. Maintain sides and slopes of excavations in safe condition until completion of backfilling.

J. Dewatering: Prevent surface water and subsurface or ground water from flowing into excavations and from flooding project site and surrounding area.

K. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.

L. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavation to collecting or run-off areas. Do not use trench excavations as temporary drainage ditches.

M. Material Storage: Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade, and shape stockpiles for proper drainage.

N. Locate and retain soil materials away from edge of excavations. Do not store within drip line of trees indicated to remain.

O. Dispose of excess soil material and waste materials as herein specified.

P. Excavation for Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10', and extending a sufficient distance from footings and foundations to permit placing and removal of concrete formwork, installation of services, other construction, and for inspection.

Q. In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade just before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work.

R. Excavation for Pavements: Cut surface under pavements to comply with cross-sections, elevations and grades as shown.

S. Excavation for Trenches: Dig trenches to the uniform width required for particular item to be installed, sufficiently wide to provide ample working room. Provide 6" to 9" clearance on both sides of pipe or conduit.

T. Excavate trenches to depth indicated or required. Carry depth of trenches for piping to establish indicated flow lines and invert elevations. Beyond building perimeter, keep bottoms of trenches sufficiently below finish grade to avoid freeze-ups.

U. For pipes or conduit 5" or less in nominal size and for flat-bottomed multiple-duct conduit units, do not excavate beyond indicated depths. Hand excavate bottom cut to accurate elevations and support pipe or conduit on undisturbed soil.

V. For pipes or conduit 6" or larger in nominal size, tanks and other mechanical/electrical work indicated to receive subbase, excavate to subbase depth indicated, or, if not otherwise indicated, to 6" below bottom of work to be supported.

W. Except as otherwise indicated, excavate for exterior water-bearing piping (water, steam, condensate, drainage) so top of piping is no less than 3'-6" below finish grade.

X. Grade bottoms of trenches as indicated, notching under pipe bells to provide solid bearing for entire body of pipe.

Y Backfill trenches with concrete where trench excavations pass within 18" of column or wall footings and which are carried below bottom of such footings, or which pass under wall footings. Place concrete to level of bottom of adjacent footing.

Z. Concrete is specified in Division 3.

AA. Do not backfill trenches until tests and inspections have been made and backfilling authorized by Architect/Engineer. Use care in backfilling to avoid damage or displacement of pipe systems.

BB. For piping or conduit less than 2'-6" below surface of roadways, provide 4" thick concrete base slab support. After installation and testing of piping or conduit, provide minimum 4" thick encasement (sides and top) of concrete prior to backfilling or placement of roadway subbase.

CC. Cold Weather Protection: Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees F. (1 degree C).

3.2 COMPACTION

A. General: Control soil compaction during construction providing minimum percentage of density specified for each area classification indicated below.

B. Percentage of Maximum Density Requirements: Compact soil to not less than the following percentages of maximum density for soils which exhibit a well-defined moisture density relationship (cohesive soils) determined in accordance with ASTM D 1557; and not less than the following percentages of relative density, determined in accordance with ASTM D 2049, for soils which will not exhibit a well-defined moisture-density relationship (cohesionless soils).

1. Structures, Building Slabs, Steps, Pavements: Compact top 12" of subgrade and each layer of backfill or fill material at 92% maximum density for cohesive material or 75% relative density for cohesionless material.
2. Lawn or Unpaved Areas: Compact top 6" of subgrade and each layer of backfill or fill material at 85% maximum density for cohesive soils and 70% relative density for cohesionless soils.
3. Walkways: Compact top 6" of subgrade and each layer of backfill or fill material at 90% maximum density for cohesive material or 70% relative density for cohesionless material.

C. Moisture Control: Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations.

D. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

1. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by discing, harrowing or pulverizing until moisture content is reduced to a satisfactory value.

3.3 BACKFILL AND FILL

A. General: Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below.

1. In excavations, use satisfactory excavated or borrow material.
2. Under grassed areas, use satisfactory excavated or borrow material.
3. Under walks and pavements, use subbase material, or satisfactory excavated or borrow material, or combination of both.
4. Under steps, use subbase material.
5. Under building slabs, use drainage fill material.
6. Under piping and conduit, use subbase material where subbase is indicated under piping or conduit; shape to fit bottom 90 deg. of cylinder.

B. Backfill excavations as promptly as work permits, but not until completion of the following:

1. Acceptance of construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
2. Inspection, testing, approval, and recording locations of underground utilities.
3. Removal of concrete formwork.
4. Removal of shoring and bracing, and backfilling of voids with satisfactory materials. Cut off temporary sheet piling driven below bottom of structures and remove in manner to prevent settlement of the structure or utilities, or leave in place if required.
5. Removal of trash and debris.
6. Permanent or temporary horizontal bracing is in place on horizontally supported walls.

C. Ground Surface Preparation: Remove existing paving, vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface to a minimum of 4" depth prior to placement of fills. Plow, strip, or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.

D. When existing ground surface has a density less than that specified under "Compaction" for particular area classification, break up ground surface, pulverize, moisture-condition to optimum moisture content, and compact to required depth and percentage of maximum density.

E. Placement and Compaction: Place backfill and fill materials in layers not more than 8" in loose depth for material compacted by heavy compaction equipment, and not more than 4" in loose depth for material compacted by hand-operated tampers.

F. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

G. Place backfill and fill materials evenly adjacent to structures, piping or conduit to required elevations. Take care to prevent wedging action of backfill against structures or displacement of piping or conduit by carrying material uniformly around structure, piping or conduit to approximately same elevation in each lift.

3.4 GRADING

A. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.

B. Grading Outside Building Lines: Grade areas adjacent to building lines to drain away from structures and to prevent ponding.

C. Finish surfaces free from irregular surface changes, and as follows:

1. Lawn or Unpaved Areas: Finish areas to receive topsoil to within no more than 0.10' above or below required subgrade elevations.
2. Walks: Shape surface of areas under walks to line, grade and cross-section, with finish surface not more than 0.10' above or below required subgrade elevation.
3. Pavements: Shape surface of areas under pavement to line, grade and cross-section, with finish surface not more than 1/2" above or below required subgrade elevation.

D. Grading Surface of Fill Under Building Slabs: Grade smooth and even, free of voids, compacted as specified, and to required elevation. Provide final grades within a tolerance of 1/2" when tested with a 10' straightedge.

E. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification.

3.5 PAVEMENT SUBBASE COURSE

A. General: Subbase course consists of placing subbase material, in layers of specified thickness, over subgrade surface to support a pavement base course.

1. See other Division 2 sections for paving specifications.

B. Grade Control: During construction, maintain lines and grades including crown and cross-slope of subbase course.

C. Shoulders: Place shoulders along edges of subbase course to prevent lateral movement. Construct shoulders of acceptable soil materials, placed in such quantity to compact to thickness of each subbase course layer. Compact and roll at least a 12" width of shoulder simultaneously with compacting and rolling of each layer of subbase course.

D. Placing: Place subbase course material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting subbase material during placement operations.

E. When a compacted subbase course is shown to be 6" thick or less, place material in a single layer. When shown to be more than 6" thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

3.6 BUILDING SLAB DRAINAGE COURSE

A. General: Drainage course consists of placement of drainage fill material, in layers of indicated thickness, over subgrade surface to support concrete building slabs.

B. Placing: Place drainage fill material on prepared subgrade in layers of uniform thickness, conforming to indicated cross-section and thickness. Maintain optimum moisture content for compacting material during placement operations.

C. When a compacted drainage course is shown to be 6" thick or less, place material in a single layer. When shown to be more than 6" thick, place material in equal layers, except no single layer more than 6" or less than 3" in thickness when compacted.

3.7 FIELD QUALITY CONTROL

A. Quality Control Testing During Construction: Allow testing service to inspect and approve subgrades and fill layers before further construction work is performed.

1. Perform field density tests in accordance with ASTM standards.
2. Perform moisture content tests as described above.

B. Footing Subgrade: For each strata of soil on which footings will be placed, conduct at least one test to verify required design bearing capacities. Subsequent verification and approval of each footing subgrade may be based on a visual comparison of each subgrade with related tested strata, when acceptable to Architect/Engineer.

1. Paved Areas and Building Slab Subgrade: Make at least one field density test of subgrade for every 2000 square feet of paved area or building slab, but in no case less than 3 tests. In each compacted fill layer, make one field density test for every 2000 square feet of overlaying building slab or paved area, but in no case less than 3 tests.

C. Foundation Wall Backfill: Take at least 2 field density tests, at locations and elevations as directed.

D. If in opinion of Architect/Engineer, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional expense.

3.8 MAINTENANCE

A. Protection of Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.

B. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

C. Reconditioning Compacted Areas: Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify surface, re-shape, and compact to required density prior to further construction.

D. Settling: Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other finish), add backfill material, compact, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.9 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. Removal to Designated Areas on Owner's Property: Transport acceptable excess excavated material to designated soil storage areas on Owner's property if so directed by Architect. Stockpile soil or spread as directed by Architect/Engineer.

B. Transport waste material, including unacceptable excavated material, trash and debris away from Owner's property and legally dispose of as required.

END OF SECTION 02200

SECTION 02230 - SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Document: "Report of Geotechnical Investigation, McKinley Middle Magnet School, Baton Rouge, Louisiana, Prepared for CSRS/The Facility Group, Baton Rouge, Louisiana" by Soils and Foundation Engineers, Inc., Issued July 14, 2004: Geotechnical report, bore hole locations, field and laboratory testing, and recommendations for foundation and pavement design, as well as general site development - herein specified as the Geotechnical Report

1.2 SUMMARY

A. This Section includes the following:

1. Protecting existing trees and vegetation to remain.
2. Removing trees and other vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping or sealing, and removing site utilities.
7. Temporary erosion and sedimentation control measures.

B. Related Sections include the following:

1. Division 1 Section "Temporary Facilities and Controls" for temporary utilities, temporary construction and support facilities, temporary security and protection facilities, and temporary erosion and sedimentation control procedures.
2. Division 2 Section "Building Demolition" for demolition of buildings, structures, and site improvements.
3. Division 2 Section "Earthwork" for soil materials, excavating, backfilling, and site grading.
4. Division 2 Section "Landscaping" for finish grading, including placing and preparing topsoil for lawns and planting.

1.3 DEFINITIONS

A. Topsoil: Natural or cultivated surface-soil layer containing organic matter and sand, silt, and clay particles; 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 in diameter; and free of subsoil and weeds, roots, toxic materials, or other nonsoil materials.

B. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.

1.4 MATERIAL OWNERSHIP

A. Except for stripped topsoil or other materials indicated to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.5 SUBMITTALS

A. Photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing.

B. Record drawings, according to Division 1 Section "Project Record Documents," identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 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 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. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

1. Louisiana One Call (1-800-272-3020)

D. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 2 Section "Earthwork."

1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

B. Base Material: Material required under all future pavements.

1. Stockpiled Material A: Recycled Portland Cement Concrete from the demolished site, graded in accordance with Section 1003.03(e) of the Louisiana Standard Specifications for Road and Bridges, 2000 Edition.

C. Drainage Fill: Material required under all future building slabs.

1. Stockpiled Material B: Recycled Portland Cement Concrete from the demolished site, graded in accordance with ASTM C-33, Size 8.

SIEVE SIZE	% PASSING
1/2	100
3/8	85-100
#4	10-30
#8	0-10

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Locate and clearly flag trees and vegetation to remain or to be relocated.

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 requirements of authorities having jurisdiction.

B. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

C. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 TREE PROTECTION

A. Erect and maintain temporary fencing around tree protection zones before starting site clearing. Remove fence when construction is complete.

1. Do not store construction materials, debris, or excavated material within fenced area.
2. Do not permit vehicles, equipment, or foot traffic within fenced area.

B. Do not excavate within tree protection zones, unless otherwise indicated.

C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

1. Cover exposed roots with burlap and water regularly.
2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
3. Coat cut faces of roots more than 1-1/2 inches in diameter with an emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
4. Backfill with soil as soon as possible.

D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.

1. Employ an arborist, licensed in jurisdiction where Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.
2. Replace trees that cannot be repaired and restored to full-growth status, as determined by Architect.

3.4 UTILITIES

A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.

1. Arrange with utility companies to shut off indicated utilities.

B. 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.

C. Excavate for and remove underground utilities indicated to be removed.

D. Removal of underground utilities is included in Division 2 Sections covering site utilities.

3.5 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, grass, 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. Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
3. Completely remove stumps, the entire root structure associated with the stumps to root diameters of 1 inch or larger, obstructions, and debris.
4. Use only hand methods for grubbing within tree protection zone.

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, and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

1. Strip surface soil of unsuitable topsoil, including trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Limit height of topsoil stockpiles to 72 inches.
2. Do not stockpile topsoil within tree protection zones.
3. Dispose of excess topsoil as specified for waste material disposal.
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 as 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 length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.
2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

C. Remove paving and underlying weak soils in the area of Boring B-2 as identified in the Geotechnical Investigation.

3.8 STORAGE OF RECYCLED MATERIALS

A. Recycled materials from demolition shall be crushed and stockpiled. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust. Stockpile materials without intermixing and separate based on the following:

1. Stockpiled Material A: Recycled Portland Cement Concrete from the demolished site, to be used as base material under future pavements.
2. Stockpiled Material B: Recycled Portland Cement Concrete from the demolished site, to be used as drainage fill under future building slabs.

B. Provide permanent 8’ chain link fence and accessible gates with security features around permissible stockpile area.

3.9 DISPOSAL

A. Disposal: 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.

END OF SECTION 02230

SECTION 02300 - 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.

B. Document: "Report of Geotechnical Investigation, McKinley Middle Magnet School, Baton Rouge, Louisiana, Prepared for CSRS/The Facility Group, Baton Rouge, Louisiana" by Soils and Foundation Engineers, Inc., Issued July 14, 2004: Geotechnical report, bore hole locations, field and laboratory testing, and recommendations for foundation and pavement design, as well as general site development - herein specified as the Geotechnical Report

1.2 SUMMARY

A. This Section includes the following:

1. Preparing subgrades for future slabs-on-grade, walks, pavements, lawns, and plantings.
2. Stockpiling drainage fill and base material for slabs and pavement.

B. Related Sections include the following:

1. Division 1 Section "Construction Facilities and Temporary Controls."

1.3 DEFINITIONS

A. Base Course: Layer placed between the subgrade and paving.

B. Backfill: Soil materials used to fill an excavation.

C. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.

D. Excavation: Removal of material encountered above subgrade elevations.

1. Additional Excavation: Excavation below subgrade elevations as directed by Geotechnical Engineer. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Bulk Excavation: Excavations more than 10 feet in width and pits more than 30 feet in either length or width.
3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Geotechnical Engineer. Unauthorized excavation, as well as remedial work directed by Geotechnical Engineer, shall be without additional compensation.

E. Fill Materials: Materials as described in the Products Section of this specification suitable for fill placement.

F. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

G. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

1.4 SUBMITTALS

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D 698 for each on-site or borrow soil material proposed for fill and backfill.

1.5 QUALITY ASSURANCE

A. Geotechnical Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 to conduct soil materials and rock-definition testing, as documented according to ASTM D 3740 and ASTM E 548.

1.6 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect 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.
3. Contact utility-locator service for area where Project is located before excavating.

B. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils, Structural Fill and Select Fill: Cohesive soil materials free of excess silt, organic or other deleterious materials; having a liquid limit (LL) less than 40 and plasticity index (PI) of 15 to 20.

C. Backfill and Fill: Satisfactory soil materials.

D. Base Material: Material required under all future pavements.

1. Stockpiled Material A: Recycled Portland Cement Concrete from the demolished site, graded in accordance with Section 1003.03(e) of the Louisiana Standard Specifications for Road and Bridges, 2000 Edition.

E. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

F. Drainage Fill: Material required under all future building slabs.

1. Stockpiled Material B: Recycled Portland Cement Concrete from the demolished site, graded in accordance with ASTM C-33, Size 8.

SIEVE SIZE	% PASSING
1/2	100
3/8	85-100
#4	10-30
#8	0-10

2.2 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:

1. Red: Electric.
2. Yellow: Gas, oil, steam, and dangerous materials.
3. Orange: Telephone and other communications.
4. Blue: Water systems.
5. Green: Sewer systems.

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.

3.2 DEWATERING

A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.3 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.4 EXCAVATION FOR TRENCHES

A. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.

1. Clearance: Minimum excavation width for trenches shall be 12 inches on each side of pipe or conduit or as indicated.

B. Trench Bottoms: Excavate trenches 6 inches deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe.

3.5 APPROVAL OF SUBGRADE

A. Notify Geotechnical Engineer when excavations have reached required subgrade.

B. If Geotechnical Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

1. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

C. Proof-roll all building and pavement subgrade areas with a “sheep’s foot” roller or a maximum 7-cubic yard dump truck loaded with soil to identify soft pockets and areas of excess yielding. Soils which are observed to rut or deflect excessively under the moving load should be undercut and replaced with Satisfactory Soil materials or stabilized with the addition of six (6) percent, by volume, of hydrated lime and compacted to 95% of Standard Proctor (ASTM D-698).

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Geotechnical Engineer.

3.6 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Geotechnical Engineer.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Geotechnical Engineer.

3.7 STORAGE OF SOIL MATERIALS

A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

B. Recycled materials from demolition shall be crushed and stockpiled similar to borrow materials and separate based on the following:

1. Stockpiled Material A: Recycled Portland Cement Concrete from the demolished site, to be used as base material under future pavements.
2. Stockpiled Material B: Recycled Portland Cement Concrete from the demolished site, to be used as drainage fill under future building slabs.

C. Provide permanent 8' chain link fence and accessible gates with security features around permissible stockpile area.

3.8 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for record documents.
3. Inspecting and testing underground utilities.
4. Removing trash and debris.
5. Removing temporary shoring and bracing, and sheeting.

3.9 FILL

A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials a minimum of 4 to 6 inches from ground surface before placing fills.

B. The first layer of fill should be placed in a relatively uniform horizontal lift and be adequately keyed into the stripped and proof-rolled soils.

C. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

3.10 MOISTURE CONTROL

A. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

B. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

C. If water must be added, it should be uniformly applied and thoroughly mixed into the soil by disking or scarifying.

3.11 COMPACTION OF BACKFILLS AND FILLS

A. Compact soils within range of 1 percentage point below and to 3 percentage points above the optimum moisture content value.

B. 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.

C. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

D. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under structures, building slabs, and steps, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill material to at least the listed percentages of Modified Proctor density as determined by ASTM D 1557.
   a. From top of base to 3 feet below finished grade - 92%
   b. From 3 feet to 7 feet below finished grade - 90%
   c. For all lifts below - 88%
2. Under future pavements and walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material to at least 90 percent of Modified Proctor density as determined by ASTM D 1557.
   a. From top of base to 3 feet below finished grade - 90%
   b. For all lifts below - 88%
3. Under lawn or unpaved areas disturbed by construction, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material to at least 88 percent of Modified Proctor density as determined by ASTM D 1557

3.12 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between adjacent existing grades and new grades.
2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1½ inch.
2. Walks: Plus or minus 1 inch.
3. Pavements: Plus or minus ½ inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1-inch when tested with a 10-foot straightedge.

3.13 FIELD QUALITY CONTROL

A. Testing Agency: Owner will select and contractor will pay for a qualified independent geotechnical engineering testing agency to perform field quality-control testing.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. Testing agency will test compaction of soils in place according to applicable ASTM Standards for material type. Tests will be performed at the following locations and frequencies:

1. At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.

D. Testing agency will test gradation of stockpiled materials A and B at a daily frequencies

1. Recycled material not achieving the gradation specified, shall be re-crushed if too large or properly disposed if too small:

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

F. Compliance cross sections: On completion of the Project, perform a topographic survey of completed embankment and prepare base map and cross sections at 50' intervals along Baseline "B". Surveyed base map shall be prepared in AutoCAD Format, Release 2000 with contours generated at 1-foot intervals.

G. Settlement gages shall be furnished and installed to monitor the rate of settlement.

1. Prior to placing of fill material, each gage shall be installed on the prepared foundation at intervals not to exceed 200 feet along Baseline "B", and shall be maintained during construction. The gage location shall be offset from the Baseline to coincide with the maximum estimated settlement along that transverse section. Settlement gages at each end of the work shall be placed within 50 ft. of the ends of the fill. Each gage shall be set on a smooth level surface on undisturbed ground. Leveling of gage beds shall be accomplished by removing the minimum amount of earth necessary to produce an even foundation and in such manner that the density of gage beds will remain at the same density as the undisturbed adjacent ground. (Burying the settlement gage below the existing ground surface will not be permitted. Leveling of gage beds by the addition of fill will not be permitted. The type of gage used shall be as shown on the Drawings. The Contractor shall determine elevations of the gages prior to placing of fill material and again within 72 hours after compliance cross sections have been taken over the completed embankment at the sites of the gages to determine settlement of the foundation. The initial and final elevation of the gages will be verified by the Owner's Representative at the site. Installation of and measurement on gages shall be at the expense of the Contractor. When the settlement gage is reinstalled or is located by boring with rotary drill, the drill hole shall be filled with a neat cement-grout tremied from the bottom of the drill hole to the top of the drill hole.

3.14 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1. Scarify or remove and replace soil material to depth as directed by Geotechnical Engineer; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil 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.

3.15 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Designated Spoil Areas: Contractor shall have the option to spread excess soil materials, excluding trash, debris, stumps and roots, in areas as designated on the Drawings. Spoil areas shall be graded to drain and smooth with finished slopes not exceeding 1 on 4.

B. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 02300

SECTION 02361 - TERMITE CONTROL

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 for termite control:

1. Soil treatment.

1.3 DEFINITIONS

A. EPA: Environmental Protection Agency.

B. PCO: Pest control operator.

1.4 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. Warranties: Special warranties specified in this Section.

1.5 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.

1.6 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.

1.7 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.

1.8 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.

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

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 and Basement Slabs: 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. Crawlspaces: Soil under and adjacent to foundations as previously indicated. Treat adjacent areas including around entrance platform, porches, and equipment bases. Apply overall treatment only where attached concrete platform and porches are on fill or ground.
4. Masonry: Treat voids.
5. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.

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

C. 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 02361

SECTION 02380 - CAISSONS

PART 1 GENERAL

1.1_ SUMMARY

A. This section includes the following:

1. Extent of caissons is shown on drawings, including locations, diameter of shafts, estimated bottom elevations, top elevations, and details of construction.

1.2 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions or American Concrete Institute (ACI) "Standard Specification for the Construction of End Bearing Drilled Piers" (ACI 336.1), and as herein specified.

B. Where provisions of above standard conflict with building regulations in effect for this project, building regulations will govern, but only to establish minimum requirements.

C. Caisson Installer Qualifications: Not less than three successfully completed contracts with similar soil conditions, shaft sizes, depths and volumes of work contained in this project. Submit satisfactory proof of compliance to Architect.

D. Superintendent: Drilling of the shafts and placing of the concrete fill and reinforcing steel shall be executed under the direct supervision of an experienced drilling superintendent whose name and qualifications shall be submitted to the Architect for approval prior to beginning any work.

E. Superintendent shall be present at all times during the installation of the shafts.

F. Installation of shafts without the presence of the superintendent is expressly prohibited.

1.3 PROJECT/SITE CONDITIONS

A. Site Information: Data on indicated subsurface conditions are not intended as representations or warranties of continuity of such conditions. It is expressly understood that Owner will not be responsible for interpretations or conclusions drawn therefrom by Contractor. Data are made available for convenience of Contractor and are not guaranteed to represent conditions that may be encountered. Geotechnical report may be reviewed at Architect's office.

B. Additional test borings and other exploratory operations may be made by Contractor at no additional cost to Owner.

C. Existing Utilities: Locate existing underground utilities by careful hand excavation before starting caisson excavation operations. If utilities are to remain in place, provide protection from damage during caisson operations.

D. Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult Architect immediately for directions as to procedure. Cooperate with Owner and utility companies in keeping services and facilities in operation. Repair damaged utilities to satisfaction of utility owner.

E. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, except when permitted in writing by Architect and after acceptable temporary utility services have been provided.

PART 2 PRODUCTS

2.1 MATERIALS

A. Concrete and related materials are specified in Division-3 sections.

2.2 CONCRETE MIX DESIGN

A. General: Use independent testing facility for preparing and reporting proposed mix designs. Testing facility shall not be same as used for field quality control testing unless otherwise acceptable to Architect. Contractor will pay for all required mix design testing. Owner shall pay for quality control testing. Contractor will pay for all retesting of failed quality control tests.

B. Design mix to produce concrete for caissons with minimum 28-day compressive strength of 3500 psi. Minimum cement content shall be 5.7 sacks per cubic yard.

C. Proportion mixes by either laboratory trail batch or field experience methods, using materials to be employed on project for each class of concrete required, complying with ACI 211.1.

D. Submit written reports to Architect of proposed mix for concrete at least 15 days prior to start of work. Do not begin concrete production until mix design has been reviewed by Architect.

E. 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; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be accepted by Architect before using in work.

F. Use water-reducing admixtures in strict compliance with manufacturer's directions. Admixtures to increase cement dispersion, or provide increased workability for low-slump concrete, may be used at Contractor's option.

G. Use amounts of admixtures as recommended by manufacturer for climatic conditions prevailing at time of placing concrete. Adjust quantities of admixtures as required to maintain quality control.

H. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement of not less than 1" and not more than 5".

2.3 CONCRETE MIXING

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

B. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

C. 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, and when air temperature is above 90 deg.F (32 deg.C) reduce mixing and delivery time to 60 minutes.

PART 3 EXECUTION

3.1 CAISSON EXCAVATION

A. General: Excavate holes for caissons to required bearing strata or elevation as shown on drawings. Excavate holes for closely spaced caissons, and those occurring in fragile or sand stratas, only after adjacent holes are filled with concrete and allowed to set.

B. Caisson design dimensions shown are minimums. The design of caissons is based on assumed strata bearing capacity. If bearing strata is not capable of maintaining bearing capacity assumed, foundation system will be revised as directed by Architect. Revisions will be paid for in accordance with contract conditions relative to changes in work.

C. Construction Tolerances: Locate centerline of caissons within the following tolerances:

1. Maximum permissible variation of location not more than 1/24th of shaft diameter or 3", whichever is less.
2. Shafts out of plumb, not more than 1.5% of length nor exceeding 12.5% of shaft diameter, whichever is less.
3. Concrete cut-off elevation, plus 1" to minus 3".
4. If above tolerances are exceeded, provide corrective construction to compensate for excessive eccentricity. Submit proposed corrective construction methods to Architect for review before proceeding.
   a. Drilling may not be started on any shaft located within 8 feet of an open shaft that has not been filled with concrete.
5. Temporary Shaft Protections: Full-length watertight temporary steel casings of sufficient thickness to withstand compressive, displacement and withdrawal stresses and to maintain shaft walls shall be bid on unit cost basis per bid form in event it is needed. Temporary casings may be left in place or may be withdrawn as concrete is placed, at Contractor's option.
6. Dewatering: Provide and maintain pumping equipment to keep excavations free of water before placing concrete. If excessive water is encountered and drilling operations must be halted, consult with Architect before using alternate methods of construction.
7. Conduct water to general site run-off ditches and disposal areas with discharge lines. Provide ditching as required to conduct water to site drainage facilities.
8. Overexcavation: No payment will be made for extra length, when caisson shafts are excavated to a greater depth than required or authorized by Architect, due to overdrilling by Contractor. Complete caisson and fill extra depth with concrete, if other conditions are satisfactory. Overexcavated shafts will be measured and paid for to original design or authorized depth.
9. Excavated Material: Remove excavated material and legally dispose off site.

3.2 REINFORCING STEEL AND DOWELS

A. Submit 4 sets of detailed shop drawings showing layout, sizes, arrangements, etc., for reinforcing steel.

B. Fabricate and erect reinforcing cages in shafts as one continuous unit using inner ring resteel. Place reinforcement accurately and symmetrically about axis of hole and hold securely in position during concrete placement.

C. Use templates to set anchor bolts, leveling plates and other accessories furnished under work of other sections. Provide blocking and holding devices to maintain required position during concrete placement.

D. Protect exposed ends of extended reinforcing dowels, or anchor bolts from mechanical damage and exposure to weather.

3.3 CONCRETE PLACEMENT

A. General: Fill caissons with concrete immediately after inspection and approval by testing laboratory. Use protection sheets (cut out to receive concrete) over excavation openings, extending at least 12" beyond edge.

B. Place concrete continuously and in a smooth flow without segregating. Provide mechanical vibration for consolidation of at least top 25' of each shaft.

C. Place concrete by means of bottom discharge bucket, flexible drop shute, elephant truck hopper, or tremie. Use chutes or tremies for placing concrete where a drop of more than 30' is required, or pump concrete into place.

D. Place concrete in-the-dry unless placing underwater is acceptable to Architect. If water occurs, and it is impracticable to dewater caisson excavation, and reasonable attempts to seal off water flow have failed, allow water level to attain its normal level and place concrete by tremie method. Control placement operations to ensure that tremie is not broken during continuous placing from bottom to top. Other methods of depositing concrete underwater may be used, if acceptable to Architect.

E. Maintain a sufficient head of concrete to prevent reduction in diameter of caisson shaft by earth pressure and to prevent extraneous material from mixing with fresh concrete. Coordinate withdrawal of temporary casings with concrete placement operations to maintain a head of concrete approximately 5' above casing bottom.

F. Stop concrete placement at cut-off elevation shown, screed level, and apply a scoured, rough finish. Where cut-off elevation is above ground elevation, form top section above grade and extend shaft to required elevation.

G. Interrupted placing operations of over one hour duration will require a cold joint installation. Leave resulting shaft surface approximately level and insert steel dowels as shown on drawings. At resumption of concrete placing, clean off surface laitance, roughen as required, and slush with a 1-to-1 cement grout or commercial bonding agent before remainder of concrete is placed.

H. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.

I. 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.

J. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

K. Do not use calcium chloride, salt and other mineral containing anti-freeze agents or chemical accelerators, unless otherwise accepted by Architect.

L. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.

M. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg.F (32 deg.C). Mixing water may be chilled, or chopped ice may be used to control concrete temperature, provided water equivalent of ice is calculated to total amount of mixing water. Cooling concrete mixture by use of liquid nitrogen may be used if acceptable to Architect.

N. Place concrete immediately upon delivery. Keep exposed concrete surfaces, and formed shaft extensions, moist by fog sprays, wet burlap or other effective means.

O. Do not use retarding admixtures without acceptance of Architect.

3.4 FIELD QUALITY CONTROL

A. Quality Control Testing During Construction: Sample and test concrete for quality control during placement, as follows: Owner shall pay for Quality Control Testing. Contractor to pay for retesting of all failed tests.
   1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
   2. Slump: ASTM C 143; one test for each concrete load at point of discharge; and one for each set of compressive strength test specimens.
   3. Air Content: ASTM C 231, pressure method; one for each set of compressive strength test specimens.

4. Compression Test Specimens: ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
5. Concrete Temperature: Test when air temperature is 40 deg.F (4 deg.C) and below, and when 80 deg.F (27 deg.C) and above; and each time a set of compression test specimens made.
6. Compressive Strength Tests: ASTM C 39; one set of four cylinders per 50 cubic yards. One specimen tested at 7 days, 2 specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
   a. When strength of field-cured cylinders is less than 85% of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing in-place concrete.
7. Report test results in writing to Architect, Structural Engineer and Contractor on same day tests are made. Include in reports project identification name and number, date of concrete placement, name of contractor, name of concrete supplier and truck number, name of concrete testing service, concrete type, location of caisson, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day test and 28-day tests.
8. Additional Concrete Tests: Testing service may take core samples of in-place concrete when test results are such that there is reasonable doubt specified concrete strengths have not been attained.
9. Complete continuous coring of caissons may be required, at Contractor's expense, where time for removal of temporary casings exceed specified limits, or where observations of placement operations indicate cause for suspicion of quality of concrete, presence of voids, segregation or other possible defects.

B. Contractor has the option of providing additional shafts in lieu of coring, however any additional shafts or shaft caps inclusive of Engineering costs will be at the Contractor's expense.

C. Geotechnical Engineer: Owner shall retain and pay for the services of a Geotechnical Engineering firm, experienced in drilled shaft installation and approved by the Architect, to do the specified testing and inspection.

D. Geotechnical firm shall be on the job at all times during the installation of the shafts. Shafts shall not be installed without the presence of the Geotechnical firm.

E. Geotechnical firm shall provide the following services:

1. Visually inspect each hole making sure that all loose and unsound material and water has been removed prior to placement of concrete.
2. Verify the depth and diameter for each shaft.
3. Submit reports covering installation of all shafts.

F. After all shafts have been satisfactorily installed, Geotechnical firm shall certify compliance with the Drawings and Specifications.

3.5 MEASUREMENT AND PAYMENT

A. Basis of Bids: Bids shall be based on number of caissons, design length from top elevation to bottom of shaft, as shown on drawings.

B. Basis for Payment: Payment for caissons will be made on actual caissons in place and accepted. The actual length and shaft diameter may vary to coincide with elevation where satisfactory bearing strata is encountered, and with actual bearing value of bearing strata determined by testing services, and with stability and characteristics of soil strata.

C. There will be no additional compensation for excavation, concrete fill, reinforcing, casings, or other costs due to unauthorized overexcavating shafts. No payment will be made for rejected caissons.

END OF SECTION 02380

SECTION 02630 - STORM DRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Document: "Report of Geotechnical Investigation, McKinley Middle Magnet School, Baton Rouge, Louisiana, Prepared for CSRS/The Facility Group, Baton Rouge, Louisiana" by Soils and Foundation Engineers, Inc., Issued July 14, 2004: Geotechnical report, bore hole locations, field and laboratory testing, and recommendations for foundation and pavement design, as well as general site development - herein specified as the Geotechnical Report

1.2 SUMMARY

A. This Section includes storm drainage outside the building.

B. Related Sections include the following:

1. Division 3 Section "Cast-in-Place Concrete" for concrete structures.

1.3 DEFINITIONS

A. PE: Polyethylene plastic.

B. PVC: Polyvinyl chloride plastic.

C. LA DOTD: Louisiana Department of Transportation and Development.

1.4 PERFORMANCE REQUIREMENTS

A. Gravity-Flow, Nonpressure-Piping Pressure Ratings: At least equal to system test pressure.

1.5 SUBMITTALS

A. Shop Drawings: Include plans, elevations, details, and attachments for the following:

1. Precast concrete manholes and other structures, including frames, covers, and grates.
2. Cast-in-place concrete manholes and other structures, including frames, covers, and grates.

B. Design Mix Reports and Calculations: For each class of cast-in-place concrete.

C. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic structures, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle precast concrete manholes and other structures according to manufacturer's written rigging instructions.

1.7 PROJECT CONDITIONS

A. Site Information: Perform site survey, research public utility records, and verify existing utility locations.

B. 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 not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without's written permission.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Provide products as listed, or approved equal:

1. Reinforced Concrete Pipe (RCP)
2. Contech A2000 as manufactured by Contech Construction Products, Inc., 1110 Adlai Stevenson Drive, Springfield, IL 62703-4297. Local representative - Contech Construction Products Inc. (225.749.1001)
3. Hancor “Blue Seal” as manufactured by Hancor, Inc.,P. O. Box 1047, Findlay, OH 45840. Local representative - Coburn Supply Co. (225.292.3700)
4. ADS “N-12” watertight PE pipe and fittings as manufactured by ADS, Inc. 4640 Trueman Boulevard, Hillard, OH 43026

2.2 PIPING MATERIALS

A. Refer to Part 3 "Piping Applications" Article for applications of pipe and fitting materials.

2.3 PIPES AND FITTINGS

A. Storm Drain Pipe and Storm Drain Pipe Arch: Conforming to LA DOTD Standard Specification for Roads And Bridges, Section 701, and referenced Sections, for materials, fittings and connections required for Storm Drain Pipe and Storm Drain Pipe Arch.

B. Cross Drain Pipe or Cross Drain Pipe Arch: Conforming to LA DOTD Standard Specification for Roads and Bridges, Section 701 and referenced Sections, for materials, fittings and connections required for Side Drain Pipe or Side Drain Pipe Arch.

C. Reinforced Concrete Pipe: Conforming to LA DOTD Standard Specification for Roads and Bridges, Section 701 and referenced Sections, for materials, fittings and connections required for Storm Drain Pipe.

2.4 CATCH BASINS

A. Heavy-Traffic, Precast Concrete Catch Basins: ASTM C 913, precast, reinforced concrete; designed according to ASTM C 890 for A-16, heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for rubber gasketed joints.

1. Gaskets: Rubber.
2. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch- diameter frame and grate.
3. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast steps or anchor ladder into base, riser, and top section sidewalls at 12- to 16-inch intervals. Omit steps for catch basins less than 60 inches deep.
4. Steps: Manufactured from deformed, 1/2-inch steel reinforcement rod complying with ASTM A 615/A 615M and encased in polypropylene complying with ASTM D 4101. Include pattern designed to prevent lateral slippage off step. Cast or anchor into sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.
5. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.

B. Cast-in-Place Concrete, Catch Basins: Construct of reinforced concrete and in accordance with the City Parish Standards (CPS) as indicated; of depth, shape, dimensions, and appurtenances indicated.

1. Bottom, Walls, and Top: Reinforced concrete.
2. Channels and Benches: Concrete.
3. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast steps or anchor ladder into sidewalls at 12- to 16-inch intervals. Omit steps for catch basins less than 60 inches deep.
4. Steps: Manufactured from deformed, 1/2-inch steel reinforcement rod complying with ASTM A 615/A 615M and encased in polypropylene complying with ASTM D 4101. Include pattern designed to prevent lateral slippage off step. Cast or anchor into sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.

C. Frames and Grates: City Parish Standards (CPS) Type Frames and Grates as indicated.

2.5 STORMWATER INLETS

A. Downspout inlet: Made with openings, of materials and dimensions as indicated.

B. Stub Inlets: Made with openings, of materials and dimensions as indicated. Include heavy-duty frames and grates as indicated.

2.6 CONCRETE

A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water-cementitious ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Division 2 Section "Earthwork."

3.2 DENTIFICATION

A. Materials and their installation are specified in Division 2 Section "Earthwork." Arrange for installing green warning tapes directly over piping and at outside edges of underground structures.

1. Use warning tape or detectable warning tape over ferrous piping.
2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

3.3 PIPING APPLICATIONS

A. General: Include joints as required by LA DOTD specifications for Storm Drain Pipe and Storm Drain Pipe Arch, or Cross Drain Pipe and Cross Drain Pipe Arch unless otherwise indicated.

B. Refer to Part 2 of this Section for detailed specifications for pipe and fitting products. Use pipe, fittings, and joining methods according to LA DOTD specifications.

3.4 INSTALLATION, GENERAL

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line, and pull past each joint as it is completed.

C. Use manholes for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.

D. Use proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. Install gravity-flow piping and connect to building's storm drains, of sizes and in locations indicated. Terminate piping as indicated.

1. Install piping pitched down in direction of flow, at minimum slope of 1 percent, unless otherwise indicated.

3.5 PIPE JOINT CONSTRUCTION AND INSTALLATION

A. General: Join and install pipe and fittings as required by LADOTD Specifications, Section 701 for Storm Drain Pipe and Storm Drain Pipe Arch, or Cross Drain Pipe and Cross Drain Pipe Arch unless otherwise indicated.

1. Wrap joints with geotextile fabric as required for Type T3 joints and described in the LADOTD Specifications, Section 701.06.

3.6 MANHOLE INSTALLATION

A. General: Install manholes, complete with appurtenances and accessories indicated.

B. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere, unless otherwise indicated.

C. Install precast concrete manhole sections with gaskets according to ASTM C 891.

D. Construct cast-in-place manholes as indicated.

3.7 CATCH-BASIN INSTALLATION

A. Construct catch basins to sizes and shapes indicated.

B. Set frames and grates to elevations indicated.

3.8 STORM DRAINAGE INLET AND OUTLET INSTALLATION

A. Construct inlet head walls, aprons, and sides of reinforced concrete, as indicated.

B. Install outlets that spill onto grade, with flared end sections to match pipe where head walls and aprons are not required.

3.9 CONCRETE PLACEMENT

A. Place cast-in-place concrete according to ACI 318 and ACI 350R.

3.10 FIELD QUALITY CONTROL

A. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.

1. In large, accessible piping, brushes and brooms may be used for cleaning.
2. Place plug in end of incomplete piping at end of day and when work stops.
3. Flush piping between manholes and other structures to remove collected debris, if required by authorities having jurisdiction.

B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Submit separate reports for each system inspection.
2. Defects requiring correction include the following:

   a. Alignment: Less than full diameter of inside of pipe is visible between structures.
   b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
   c. Crushed, broken, cracked, or otherwise damaged piping.
   d. Infiltration: Water leakage into piping.
   e. Exfiltration: Water leakage from or around piping.

3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

C. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate reports for each test.

END OF SECTION 02630

SECTION 02741 - 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.

B. Document: "Report of Geotechnical Investigation, McKinley Middle Magnet School, Baton Rouge, Louisiana, Prepared for CSRS/The Facility Group, Baton Rouge, Louisiana" by Soils and Foundation Engineers, Inc., Issued July 14, 2004: Geotechnical report, bore hole locations, field and laboratory testing, and recommendations for foundation and pavement design, as well as general site development - herein specified as the Geotechnical Report

1.2 SUMMARY

A. This Section includes pavement marking paint and all on-site asphalt work including drives and parking areas for the Project:

B. Related Sections include the following:

1. Division 2 Section "Embankment" for base.

1.3 DEFINITIONS

A. Hot-Mix Asphalt Paving: As detailed on the Drawings, conforming to the Louisiana Department of Transportation and Development, Louisiana Standard Specifications for Roads and Bridges, 2000 Edition, Sections 501, 503 and 505, and referenced Sections.

B. LA DOTD: Louisiana Department of Transportation and Development.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

B. Job-Mix Formula: At least 10 days prior to paving, Contractor shall submit a design to the Owners representative.

C. Material Test Reports: All materials including aggregates, liquid antistrip, and asphalt must be approved for use by the LA DOTD and listed on LA DOTD's Qualified Products List. Test reports indicating conformance to specification shall be available upon request.

D. Material Certificates: A certificate of analysis shall accompany all liquid asphalt transports, signed by manufacturers indicating conformance to PG70-22m specifications.

1.5 QUALITY CONTROL/ASSURANCE

A. Contractor Qualifications: Asphalt Contractor shall be a licensed Louisiana contractor and shall provide necessary quality control of both plant and pavement site with certified asphalt technicians.

B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated, as documented according to ASTM E 548.

C. Regulatory Requirements: Comply with LA DOTD, Section 503 for asphalt paving work.

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 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 aggregate base is wet or excessively damp or if surface conditions as stated in LADOTD Section 501 are not met.

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 & ASPHALT MATERIALS

A. General: Provide materials in accordance with LADOTD Sections 501 and 1002 for Type 8, Wearing Course.

2.2 AUXILIARY MATERIALS

A. Sand: ASTM D 1073, Grade Nos. 2 or 3.

B. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with LA DOTD, Section 1015.12.

1. Color: As indicated.

C. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with LA DOTD, Section 1015.12.

1. Color: As indicated.

D. Glass Beads: Complying with LA DOTD, Section 1015.13.

2.3 MIXES

A. Hot-Mix Asphalt: A previously approved LA DOTD mix design complying with the following requirements:

1. Provide mixes with a history of satisfactory performance in geographical area where Project is located.
2. Asphalt Base Course: meeting mixture requirements of a LA DOTD, Type 8 wearing course, (i.e. 3/4" nominal maximum aggregate size).
3. Asphalt Surface Course: 1/2" nominal aggregate size meeting combined gradation requirements below. All other mix and pavement requirements shall meet LA DOTD, Type 8 wearing course.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that stone base is dry and in suitable condition to support paving and imposed loads.

B. Proof-roll subbase to locate areas that are unstable or that require further compaction.

C. Proceed with paving only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared aggregate base is ready to receive paving.

1. Sweep loose granular particles from surface of unbound-aggregate base. Do not dislodge or disturb aggregate embedded in compacted surface of aggregate base.

B. Prime Coat: Apply in accordance with LADOTD, Section 505.

3.3 HAULING, PAVING, FINISHING, JOINT CONSTRUCTION, COMPACTION AND SURFACE TOLERANCES

A. All hauling, paving, finishing, joint construction, compaction and surface tolerances shall be accordance with LADOTD, Section 501.

3.4 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Engineer.

B. Allow paving to age 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.

1. Broadcast glass spheres uniformly into wet pavement markings at a rate of 6 lb/gal..

3.5 FIELD QUALITY CONTROL AND ASSURANCE

A. General: Provide quality control in accordance with the Louisiana Department of Transportation and Development, Louisiana Standard Specifications for Roads and Bridges, 2000 Edition, Section 501, 503 and 505, and referenced Sections

B. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

C. Remove and replace or install additional hot-mix asphalt, at Owner’s option, where test results or measurements indicate that the mixture does not comply with specified requirements.

3.10 DISPOSAL

D. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.

1. Do not allow excavated materials to accumulate on-site.

END OF SECTION 02741

SECTION 02751 - CEMENT CONCRETE PAVEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Document: "Report of Geotechnical Investigation, McKinley Middle Magnet School, Baton Rouge, Louisiana, Prepared for CSRS/The Facility Group, Baton Rouge, Louisiana" by Soils and Foundation Engineers, Inc., Issued July 14, 2004: Geotechnical report, bore hole locations, field and laboratory testing, and recommendations for foundation and pavement design, as well as general site development - herein specified as the Geotechnical Report.

C. Contractor is advised that thickness, as shown on the Drawings, are designed for facility use under normal conditions of loading for vehicle weight and frequency. Should these areas be used as haul roads, staging areas or other heavy and/or frequent loadings for construction activities, the Contractor shall notify the Geotechnical Engineer for re-examination and/or redesign of the affected areas at no additional cost.

1.2 SUMMARY

A. This Section includes exterior cement concrete pavement for the following:

1. Driveways and roadways.
2. Parking lots.
3. Curbs and gutters.
4. Walkways.

B. Related Sections include the following:

1. Division 2 Section "Earthwork" for subgrade preparation, grading, and base course.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, expansive hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

1.4 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixes: For each concrete pavement mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed pavement work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1. Manufacturer must be certified according to the National Ready Mix Concrete Association's Plant Certification Program.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant and each aggregate from one source.

E. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by the requirements of the Contract Documents.

F. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixes.

1.6 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 approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.

1. Use flexible or curved forms for curves of a radius 100 feet or less.

B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.2 STEEL REINFORCEMENT

A. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

B. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed.

C. Plain Steel Wire: ASTM A 82, as drawn.

D. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.

E. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.

F. Hook Bolts: ASTM A 307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement bars, welded wire fabric, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.3 CONCRETE MATERIALS

A. General: Use the same brand and type of cementitious material from the same manufacturer throughout the Project.

B. Portland Cement: ASTM C 150, Type I or II.

1. Fly Ash: ASTM C 618, Class F or C

C. Aggregate: ASTM C 33, uniformly graded, from a single source, with coarse aggregate as follows:

1. Maximum Aggregate Size: 1-1/2 inches nominal.
2. Do not use fine or coarse aggregates containing substances that cause spalling.

D. Water: ASTM C 94.

2.4 ADMIXTURES

A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures

B. Air-Entraining Admixture: ASTM C 260.

C. Water-Reducing Admixture: ASTM C 494, Type A.

D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

G. Air-Entraining Admixture: ASTM C 260.

H. Water-Reducing Admixture: ASTM C 494, Type A.

I. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

J. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

K. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

2.5 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

E. White Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B.

F. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Evaporation Retarder:

a. Cimfilm; Axim Concrete Technologies.
b. Finishing Aid Concentrate; Burke Group, LLC (The).
c. Spray-Film; ChemMasters.
d. Aquafilm; Conspec Marketing & Manufacturing Co., Inc.
e. Sure Film; Dayton Superior Corporation.
f. Eucobar; Euclid Chemical Co.
g. Vapor Aid; Kaufman Products, Inc.
h. Lambco Skin; Lambert Corporation.
i. E-Con; L&M Construction Chemicals, Inc.
j. Confilm; Master Builders, Inc.
k. Waterhold; Metalcrete Industries.
l. Rich Film; Richmond Screw Anchor Co.
m. SikaFilm; Sika Corporation.
n. Finishing Aid; Symons Corporation.
o. Certi-Vex EnvioAssist; Vexcon Chemicals, Inc.

2. White Waterborne Membrane-Forming Curing Compound:

a. AH Curing Compound #2 WB WP; Anti-Hydro International, Inc.
b. Aqua Resin Cure; Burke Group, LLC (The).
c. W.B. Resin Cure; Conspec Marketing & Manufacturing Co., Inc.
d. Thinfilm 450; Kaufman Products, Inc.
e. Aqua Kure-White; Lambert Corporation.
f. L&M Cure R-2; L&M Construction Chemicals, Inc.
g. 1200-White; W. R. Meadows, Inc.
h. White Pigmented Resin Cure E; Nox-Crete Products Group, Kinsman Corporation.
i. Rich Cure White E; Richmond Screw Anchor Co.
j. Resi-Chem High Cure; Symons Corporation.
k. Horncure 200-W; Tamms Industries Co., Div. of LaPorte Construction Chemicals North America, Inc.
l. Hydro White 309; Unitex.

2.6 RELATED MATERIALS

A. Expansion Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

B. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with LA DOTD, Section 1015.12.

1. Color: As indicated.

C. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with LA DOTD, Section 1015.12.

1. Color: As indicated.

D. Glass Beads: Complying with LA DOTD, Section 1015.13.

E. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent aluminum oxide and not less than 25 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

F. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

G. Cold-Applied Joint Sealants

1. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, nonsag silicone sealant complying with ASTM D 5893 for Type NS (<u>to be used</u> at all sloped (greater than 1 on 4) or vertical joint locations).

2. Type SL Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, self-leveling silicone sealant complying with ASTM D 5893 for Type SL (<u>not to be used</u> on sloped (greater than 1 on 4) or vertical joint locations).

3. Available Products: Subject to compliance with requirements, cold-applied joint sealants that may be incorporated into the Work include, but are not limited to, the following:

a) Type NS Silicone Sealant for Concrete:

(1) Crafco Inc.; RoadSaver Silicone.
(2) Dow Corning Corporation; 888.

b) Type SL Silicone Sealant for Concrete:

(1) Crafco Inc.; RoadSaver Silicone SL.
(2) Dow Corning Corporation; 890-SL

H. Joint-Sealant Backer Materials

1. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint sealant manufacturer based on field experience and laboratory testing.

2. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depths and prevent bottom-side adhesion of sealant.

I. Primers

1. Primers: Product recommended by joint sealant manufacturer where required for adhesion of

sealant to joint substrates indicated, as determined from preconstruction joint- sealant-substrate tests and field tests.

2.7 CONCRETE MIXES

A. Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.

B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the trial batch method.

1. Do not use Owner's field quality-control testing agency as the independent testing agency.

C. Proportion mixes to provide concrete with the following properties:

1. Compressive Strength (28 Days): 4,500 psi.
2. Cement: 5 1/2 Bag (Minimum)
3. Maximum Water-Cementitious Materials Ratio: 0.45.
4. Slump Range: 3 to 5 inches.
    a. Slump Limit for Concrete Containing High-Range Water-Reducing Admixture: Not more than 8 inches after adding admixture to plant- or site-verified, 2- to 3-inch slump.

D. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.
2. Combined Fly Ash and Pozzolan: 25 percent.

E. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 2.5 to 4.5 percent.

2.8 CONCRETE MIXING

D. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94.

PART 3 - EXECUTION

3.1 PREPARATION

A. Proof-roll prepared subbase surface to check for unstable areas and verify need for additional compaction. Proceed with pavement only after nonconforming conditions have been corrected and subgrade is ready to receive pavement.

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 pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form release agent to ensure separation from concrete without damage.

3.3 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement and with recommendations in CRSI's "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 construction and expansion joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.

1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour, unless pavement terminates at expansion joints. Form weakened-plane joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints (Allowed for Walks and Sidewalks Only): Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to the following radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.

   a. Radius: 1/4 inch.

2. Sawed Joints (Allowed for All Paving): Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 3/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.

3. Alternate Construction Joints: Keyed construction joints may be substituted for sawed joints. If the Contractor elects to use this alternate, he/she must use this joint at all contraction joint locations.

   a. Provide preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
   b. Discontinue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.

c. Provide tie bars at sides of pavement strips where indicated.
d. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Expansion Joints: Form expansion joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, sidewalks, other fixed objects, and where indicated.

1. Locate expansion joints at intervals of 60 feet, unless otherwise indicated.
2. Extend joint fillers full width and depth of joint.
3. Terminate joint filler less than 1/2 inch or more than 1 inch below finished surface if joint sealant is indicated.
4. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
5. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.

D. Install dowel bars and support assemblies at joints where indicated. Dowels shall be liberally greased at one side of the expansion joint and provided with an expansion cap to ensure free expansion. Dowels should be true and perpendicular to the joint in order to ensure free expansion. Special care should be taken to secure dowels to prevent displacement during concrete placement.

E. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to the following radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.

1. Radius: 3/8 inch.

3.5 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcement 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 reinforcement before placing concrete. Do not place concrete on frozen surfaces.

C. Moisten base course 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 recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.

E. Do not add water to concrete during delivery, at Project site, or during placement.

F. 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.

G. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures to consolidate concrete according to recommendations in 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 reinforcement, dowels, and joint devices.

H. Screed pavement surfaces with a straightedge and strike off. Commence initial floating using bull floats or darbies to form an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading dry-shake surface treatments.

I. 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 approved, remove and replace with formed concrete.

J. Slip-Form Pavers: When automatic machine placement is used for pavement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce pavement to required thickness, lines, grades, finish, and jointing as required for formed pavement.

1. Compact subbase and prepare subgrade of sufficient width to prevent displacement of paver machine during operations.

K. 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.

L. Cold-Weather Placement: Comply with ACI 306.1 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, 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.
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 specified and approved in mix designs.

M. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F. Chilled mixing water 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 reinforcement steel with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, reinforcement steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.6 CONCRETE FINISHING

A. General: Wetting of concrete surfaces during screeding, initial floating, or finishing operations is prohibited.

B. Float Finish: Begin the second floating operation 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. Cut down high spots, and fill low spots. Refloat surface immediately to uniform granular texture.

1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture for all sidewalk and concrete paving where only pedestrian traffic is anticipated.

2. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture for all vehicular traffic areas.

3.7 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and follow recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces to reduce plastic shrinkage cracking if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. Ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

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 seven 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 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 written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.8 PAVEMENT TOLERANCES

A. Comply with tolerances of ACI 117 and as follows:

1. Elevation: 1/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-foot- long, unleveled straightedge not to exceed 1/4 inch.
4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch.
5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch.
6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/8 inch per 12 inches.
8. Joint Spacing: 3 inches.
9. Contraction Joint Depth: Plus 1/4 inch, no minus.
10. Joint Width: Plus 1/8 inch, no minus.

3.9 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Engineer.

B. Allow concrete pavement to cure for 28 days and be dry 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.

1. Broadcast glass spheres uniformly into wet pavement markings at a rate of 6 lb/gal..

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspection agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article.

B. Testing Services: Testing shall be performed according to the following requirements:

1. Sampling Fresh Concrete: Representative samples of fresh concrete shall be obtained according to ASTM C 172, except modified for slump to comply with ASTM C 94.
2. Slump: ASTM C 143; one test at point of placement for each compressive-strength test, but not less than one test for each day's pour of each type of concrete. Additional tests will be required when concrete consistency changes.
3. Air Content: ASTM C 231, pressure method; one test for each compressive-strength test, but not less than one test for each day's pour of each type of air-entrained concrete.
4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each set of compressive-strength specimens.
5. Compression Test Specimens: ASTM C 31/C 31M; one set of four standard cylinders for each compressive-strength test, unless otherwise indicated. Cylinders shall be molded and stored for laboratory-cured test specimens unless field-cured test specimens are required.
6. 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.. One specimen shall be tested at 7 days and two specimens at 28 days; one specimen shall be retained in reserve for later testing if required.
7. When frequency of testing will provide fewer than five compressive-strength tests for a given class of concrete, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, current operations shall be evaluated and corrective procedures shall be provided for protecting and curing in-place concrete.
9. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive compressive-strength test results equal or exceed specified compressive strength and no individual compressive-strength test result falls below specified compressive strength.

C. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 24 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing agency, concrete type and class, location of concrete batch in pavement, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

D. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as the sole basis for approval or rejection.

E. Additional Tests: Testing agency shall 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 Engineer. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

F. Additional tests shall be at no cost to the Owner.

3.11 REPAIRS AND PROTECTION

A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this Section.

B. Drill test cores where directed by Engineer when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.

C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 02751

SECTION 02764 - PAVEMENT JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Expansion and contraction joints within portland cement concrete pavement.
2. Joints between portland cement concrete pavement.

B. Related Sections include the following:

1. Division 2 Section "Portland Cement Concrete Paving" for constructing joints in concrete paving.

1.3 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.
B. Samples for Verification: For each type and color of joint sealant required. Install joint-sealant samples 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.
C. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.
D. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of s and owners, and other information specified.
E. Compatibility and Adhesion Test Reports: From joint sealant manufacturer indicating the following:

1. Materials forming joint substrates and joint-sealant backer materials have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

F. Product Test Reports: From a qualified testing agency indicating joint sealants comply with requirements, based on comprehensive testing of current product formulations.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.
B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.
C. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency, based on testing current sealant formulations within a 36-month period.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
2. Test joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

D. Preconstruction Compatibility and Adhesion Testing: Submit to joint sealant manufacturer, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Use manufacturer's standard test methods to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Testing will not be required if joint sealant manufacturer submits joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.
B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: 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.
2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F.
3. When joint substrates are wet.

B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than that allowed by joint sealant manufacturer for application indicated.
C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, 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.

2.2 COLD-APPLIED JOINT SEALANTS

A. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, nonsag silicone sealant complying with ASTM D 5893 for Type NS (<u>to be used</u> at all sloped (greater than 1 on 4) or vertical joint locations).
B. Type SL Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, self-leveling silicone sealant complying with ASTM D 5893 for Type SL (<u>not to be used</u> on sloped (greater than 1 on 4) or vertical joint locations).
C. Available Products: Subject to compliance with requirements, cold-applied joint sealants that may be incorporated into the Work include, but are not limited to, the following:

1. Type NS Silicone Sealant for Concrete:
   a. Roadsaver Silicone-NS; Crafco Inc.

b. 888; Dow Corning.

2. Type SL Silicone Sealant for Concrete:
   a. 890-SL; Dow Corning.

2.3 JOINT-SEALANT BACKER MATERIALS

A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint sealant manufacturer based on field experience and laboratory testing.
B. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depths and prevent bottom-side adhesion of sealant.

2.4 PRIMERS

A. Primers: Product recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint- sealant-substrate tests and field tests.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions.
B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's written installation instructions applicable to products and applications indicated, unless more stringent requirements apply.
B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

   1. Do not leave gaps between ends of backer materials.
   2. Do not stretch, twist, puncture, or tear backer materials.
   3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

D. Install sealants by proven techniques to 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 provided for each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealants from surfaces adjacent to joint.
2. Use tooling agents that are approved in writing by joint sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint sealant manufacturer's written instructions, unless otherwise indicated.

G. Provide recessed joint configuration for silicone sealants of recess depth and at locations indicated.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

END OF SECTION 02764

SECTION 02821 - CHAIN-LINK FENCES AND GATES

PART 1 - GENERAL

1.1 DEFINITIONS

A. CLFMI: Chain Link Fence Manufacturers Institute.

B. Zn-5-Al-MM Alloy: Zinc-5 percent aluminum-mischmetal alloy.

1.2 SUBMITTALS

A. Product Data: Material descriptions, construction details, dimensions of individual components and profiles, and finishes for the following:

1. Fence and gate posts, rails, and fittings.
2. Chain-link fabric, reinforcements, and attachments.
3. Gates and hardware.
4. Accessories: Privacy slats.

B. Shop Drawings: Show locations of fence, each gate, posts, rails, and tension wires and details of extended posts, extension arms, gate swing, or other operation, hardware, and accessories. Indicate materials, dimensions, sizes, weights, and finishes of components. Include plans, elevations, sections, gate swing and other required installation and operational clearances, and details of post anchorage and attachment and bracing.

C. Product Certificates: Signed by manufacturers of chain-link fences and gates certifying that products furnished comply with requirements.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed chain-link fences and gates similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Source Limitations for Chain-Link Fences and Gates: Obtain each color, grade, finish, type, and variety of component for chain-link fences and gates from one source with resources to provide chain-link fences and gates of consistent quality in appearance and physical properties.

1.4 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted by the Architect. Do not proceed with utility interruptions without Architect's written permission.

B. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FENCE FABRIC

A. Steel Chain-Link Fence Fabric: Height indicated on Drawings. Provide fabric fabricated in one-piece widths. Comply with CLFMI's "Product Manual" and with requirements indicated below:

1. Mesh and Wire Size: 2-inch mesh, 0.148-inch diameter.

2. Zinc-Coated Fabric: ASTM A 392, with zinc coating applied to mesh fabric after weaving with the following minimum coating weight:

   a. Class 2: Not less than 2 oz./sq. ft. of uncoated wire surface.

3. Coat selvage ends of fabric that is metallic coated during the weaving process with manufacturer's standard clear protective coating.

B. Selvage: Twisted at top selvage and knuckled at bottom.

2.2 INDUSTRIAL FENCE FRAMING

A. Round Steel Pipe (Line, End, Corner, Pull Posts, Post Brace Rail, Top Rail and Intermediate Rail): Standard weight, Schedule 40, galvanized steel pipe complying with ASTM F 1083 for Heavy Industrial Fence. Comply with ASTM F 1043, Material Design Group IA, external and internal coating Type A, consisting of not less than 1.8-oz./sq. ft. zinc.

B. Post Brace Rails: Provide brace rail with truss rod assembly for each gate, end, and pull post. Provide two brace rails extending in opposing directions, each with truss rod assembly, for each corner post and for pull posts. Provide rail ends and clamps for attaching rails to posts.

C. Top Rails: Fabricate top rail from lengths 21 feet or longer, with swedged-end or fabricated for expansion-type coupling, forming a continuous rail along top of chain-link fabric.

D. Extended Members: Extend posts above top of chain-link fabric as required to attach assemblies.

2.3 INDUSTRIAL SWING GATES

A. General: Comply with ASTM F 900 for double swing gate types.

1. Metal Pipe and Tubing: Galvanized steel. Comply with ASTM F 1043 and ASTM F 1083 for materials and protective coatings.

B. Frames and Bracing: Fabricate members from round, galvanized steel tubing with outside dimension and weight according to ASTM F 900 and the following:

1. Gate Fabric Height: 2 inches less than adjacent fence height.
2. Leaf Width: Per requirements for Light Industrial Fence of a double leaf 12-ffot opening.

C. Extended Gate Posts and Frame Members: Extend gateposts and frame end members above top of chain-link fabric at both ends of gate frame as required to attach assemblies.

D. Hardware: Latches permitting operation from both sides of gate, locking devices, and hinges. Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate.

2.4 FITTINGS

A. General: Provide fittings for a complete fence installation, including special fittings for corners. Comply with ASTM F 626.

B. Post and Line Caps: Hot-dip galvanized pressed steel or hot-dip galvanized cast iron; weather tight closure cap for each post with loop to receive tension wire or top rail.

C. Rail and Brace Ends: Hot-dip galvanized pressed steel or hot-dip galvanized cast iron; with rail ends or other means for attaching rails securely to each gate, corner, pull, and end post.

D. Top Rail Sleeves: Hot-dip galvanized pressed steel or round steel tubing; not less than 6 inches long.

E. Rail Clamps: Hot-dip galvanized pressed steel, line and corner boulevard clamps for connecting top and bottom rails in the fence line to line posts.

F. Tension and Brace Bands: Hot-dip galvanized pressed steel.

G. Tension Bars: Hot-dip galvanized steel, length not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.

H. Truss Rod Assemblies: Hot-dip galvanized steel rod and turnbuckle or other means of adjustment.

I. Tie Wires, Clips, and Fasteners: For attaching chain-link fabric to posts, rails, and frames, provide aluminum wire ties, according to ASTM B 211, alloy 1350-H19, 0.192-inch diameter, mill-finished wire.

2.5 PRIVACY SLATS

A. Material: PVC, UV-light stabilized, not less than 0.023 inches thick, sized to fit mesh specified for direction indicated or;

B. Material: Polyethylene tubular slats, not less than 0.023 inches thick, manufactured for chain-link fences from virgin polyethylene containing UV inhibitor, sized to fit mesh specified for direction indicated or;

C. Material: Aluminum, not less than 0.01 inch thick, sized to fit mesh specified for direction indicated.

D. Color: As selected by Architect from manufacturer's full range.

2.6 CAST-IN-PLACE CONCRETE

A. General: Comply with ACI 301 for cast-in-place concrete.

B. Materials: Portland cement complying with ASTM C 150, aggregates complying with ASTM C 33, and potable water for ready-mixed concrete complying with ASTM C 94.

C. Concrete Mixes: Normal-weight concrete with not less than 3000-psi compressive strength (28 days), 3-inch slump, and 1-inch maximum size aggregate.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance.

3.2 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts for review by Architect.

3.3 INSTALLATION, GENERAL

A. General: Install chain-link fencing to comply with ASTM F 567 and more stringent requirements specified.

B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.

C. Post Setting: Hand-excavate holes for post foundations in firm, undisturbed or compacted soil. Set posts in concrete footing. Protect portion of posts aboveground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during placement and finishing operations until concrete is sufficiently cured. Extend concrete 2 inches above grade, smooth, and shape to shed water.

3.4 CHAIN-LINK FENCE INSTALLATION

A. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 15 degrees or more.

B. Line Posts: Space line posts uniformly at 10 feet o.c.

C. Post Bracing Assemblies: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Install braces at end and gate posts and at both sides of corner and pull posts. Locate horizontal braces at midheight of fabric on fences with top rail. Install so posts are plumb when diagonal rod is under proper tension.

D. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended by fencing manufacturer.

E. Bottom Rails: Install, spanning between posts, using fittings and accessories.

F. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 1 inch between finish grade or surface and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

G. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches o.c.

H. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

I. Privacy Slats: Install slats in direction indicated, securely locked in place.
   1. Diagonally, for privacy factor of 80 to 85.

3.5 GATE INSTALLATION

A. General: Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.6 ADJUSTING

A. Gate: Adjust gate to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding. Lubricate hardware and other moving parts.

END OF SECTION 02821

SECTION 02920 - LAWNS AND GRASSES

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 SCOPE

A. All disturbed areas that are not paved, or require riprap, shall be hydroseeded and fertilized.

1.3 SUMMARY

A. This Section includes the following:

1. Seeding.
2. Sodding
3. Erosion Control Blanket

B. Related Sections include the following:

1. Division 2 Section "Site Clearing" for topsoil stripping and stockpiling.
2. Division 2 Section "Earthwork" for excavation, filling and backfilling, and rough grading.
3. Division 2 Section "Subdrainage" for subsurface drainage.

1.4 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

C. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

1.5 SUBMITTALS

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

B. Certification of Grass Seed: From seed vendor for each grass-seed monostand or 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.

C. Certification of Erosion Control Blanket: From manufacturer for longevity and composition of net type, number of nets, and matrix.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer whose work has resulted in successful lawn establishment.

1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

B. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Topsoil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of topsoil.

1. Report suitability of topsoil for lawn growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce a satisfactory topsoil.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

B. Sod: Harvest, deliver, store, and handle sod according to requirements in TPI's "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in its "Guideline Specifications to Turfgrass Sodding."

C. Erosion Control Blanket: Deliver blanket in rolls with light protected cover.

1.8 SCHEDULING

A. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit.

1.9 LAWN MAINTENANCE

A. Begin maintenance 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 from date of Substantial Completion.

a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established, continue maintenance during next planting season.

2. Sodded Lawns: 30 days from date of Substantial Completion

B. Maintain and establish lawn 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.

1. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch. Anchor as required to prevent displacement.

C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawn uniformly moist to a depth of 4 inches.

1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas. Water lawn at a minimum rate of 1 inch per week.

D. Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 40 percent of 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. Schedule initial and subsequent mowings to maintain the following grass height:

1. Mow grass 1/2 to 1 inch high.

E. Lawn Postfertilization: Apply fertilizer after initial mowing and when grass is dry.

1. Use fertilizer that will provide actual nitrogen of at least 1 lb/1000 sq. ft. to lawn area.

PART 2 - PRODUCTS

2.1 SEED

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species: State-certified seed of grass species, as follows:

1. Full Sun: Bermudagrass (Cynodon dactylon).

2.2 TURFGRASS SOD

A. Turfgrass Sod: Approved, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with TPI's "Specifications for Turfgrass Sod Materials" in its "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.

B. Turfgrass Species: Bermudagrass (Cynodon dactylon) or St. Augustine grass (Stenotaphrum secundatum**)**.

2.2 TOPSOIL

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content; 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-site. Verify suitability of stockpiled surface soil to produce topsoil. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

a. Supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Obtain topsoil displaced from naturally well-drained construction or mining sites where topsoil occurs at least 4 inches deep; do not obtain from agricultural land, bogs or marshes.

2.3 FERTILIZER

A. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.4 MULCHES

A. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic; free of plant-growth or germination inhibitors; with maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

B. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

2.5 PLANTING SOIL MIX

A. Planting Soil Mix: Mix topsoil with the following soil amendments and fertilizers in the following quantities:

1. Ratio of Loose Compost to Topsoil by Volume: 1:4.
2. Weight of Slow-Release Fertilizer per 1000 Sq. Ft..

2.6 EROSION CONTROL BLANKET

A. Erosion Control Blanket: Degradable netting with the following minimum characteristics:

1. Slope Gradient: 4 horizontal to 1 vertical.
2. Functional Longevity: Greater than six (>6) months.
3. Number of Nets: 2.
4. Net Type: Synthetic or Organic.
5. Matrix: Straw, Coconut, Excelsior or combination thereof.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydroseeding overspray.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

1. Install erosion control blanket as instructed by the manufacturer.

3.3 LAWN PREPARATION

A. Limit lawn subgrade preparation to areas to be planted.

B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Apply fertilizer directly to subgrade before loosening.
2. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.

   a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.

3. Spread planting soil mix to a depth of 4 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

   a. Spread approximately one-half the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil mix.

C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. 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.

D. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

E. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

3.4 HYDROSEEDING

A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with nonasphaltic tackifier.
2. Apply slurry uniformly to all areas to be seeded in a one-step process. Apply mulch at a minimum rate of1500-lb/acre dry weight but not less than the rate required to obtain specified seed-sowing rate.

3.5 SATISFACTORY LAWNS

A. Satisfactory Seeded Lawn: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.

B. Reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.

3.6 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by lawn work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period and remove after lawn is established.

END OF SECTION 02920

SECTION 03300 - CONCRETE WORK

PART 1 GENERAL

1.1 SUMMARY

A. This section includes the following:

1. Extent of concrete work is shown on drawings. Concrete paving and walks are specified in Division 2.

1.2 SUBMITTALS

A. Product Data: Submit data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing compounds, dry-shake finish materials, and others as requested by Architect.

B. Shop Drawings; Reinforcement: Submit 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 schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

C. Samples: Submit samples of materials as specified and as otherwise requested by Architect, including names, sources, and descriptions.

D. Laboratory Test Reports: Submit laboratory test reports for concrete materials and mix design test as specified.

1.3 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:

1. 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 Testing Service: Contractor to engage and pay a testing laboratory acceptable to Architect to perform material evaluation tests and to design concrete mixes.

C. Materials and installed work may require testing and retesting, as directed by Architect, at anytime during progress of work. Allow free access to material stockpiles and facilities. Retesting of rejected materials for installed work shall be done at Contractor's expense.

PART 2 PRODUCTS

2.1 FORM MATERIALS

A. Forms for Exposed Finish Concrete: Unless otherwise indicated, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on drawings. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

1. Use overlaid plywood complying with U.S. Product Standard PS-1 "A-C or B-B High Density Overlaid Concrete Form", Class I.

B. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal, or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.

C. Forms for Textured Finish Concrete: Form textured finish concrete surfaces with units of face design, size, arrangement, and configuration as shown on drawings or as required to match Architect's control sample. Provide solid backing and form supports to ensure stability of textured form liners.

D. Forms for Cylindrical Columns and Supports: Form round-section members with metal, fiberglass reinforced plastic, or paper or fiber tubes. Construct paper or fiber tubes of laminated plies using water-resistant adhesive with wax-impregnated exterior for weather and moisture protection. Provide units with sufficient wall thickness to resist loads imposed by wet concrete without deformation.

E. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

2.2 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Steel Wire: ASTM A 82, plain, cold-drawn steel.

C. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.

D. Welded Deformed Steel Wire Fabric: ASTM A 497.

E. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications, unless otherwise acceptable.

1. For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.
2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

2.3 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I, unless otherwise acceptable to Architect.

B. Use one brand of cement throughout project, unless otherwise acceptable to Architect.

C. Fly Ash nor Slag: Not permitted.

D. Normal Weight Aggregates: ASTM C 33, and as herein specified. Provide aggregates from a single source for exposed concrete.

1. For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.
2. Local aggregates not complying with ASTM C 33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to Architect.

E. Water: Drinkable.

F. Air-Entraining Admixture: ASTM C 260 - Coordinate use with Ashford Formula.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
   a. "Sika Aer"; Sika Corp.
   b. "MB-VR or MB-AE"; Master Builders.
   c. "Darex AEA"; W. R. Grace.
   d. "Edoco 2001 or 2002"; Edoco Technical Products.

G. Water-Reducing Admixture: ASTM C 494, Type A, and containing not more than 0.1 percent chloride ions.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
   a. "Eucon WR-75"; Euclid Chemical Co.
   b. "Pozzolith 344"; Master Builders.
   c. "Plastocrete 160"; Sika Chemical Corp.
   d. "Chemtard"; Chem-Masters Corp.

H. High-Range Water-Reducing Admixture (Super Plasticizer): ASTM C 494, Type F or Type G and containing not more than 0.1 percent chloride ions.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
   a. "WRDA 19"; W. R. Grace.
   b. "PSP"; Protex Industries Inc.
   c. "Super P"; Anti-Hydro.
   d. "Sikament"; Sika Chemical Corp.
   e. "Mighty 150"; ICI Americas Corp.
   f. "Eucon 37"; Euclid Chemical Co.
   g. "PSI Super"; Gifford-Hill.
   h. "Pozzolith 400"; Master Builders.

I. Water-Reducing, Non-Chloride Accelerator Admixture: ASTM C 494, Type E, and containing not more than 0.1 percent chloride ions.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
   a. "Accelquard 80"; Euclid Chemical Co.
   b. "Pozzolith 500"; Master Builders.

J. Water-Reducing, Retarding Admixture: ASTM C 494, Type D, and containing not more than 0.1 percent chloride ions.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
   a. "Edoco 20006"; Edoco Technical Products.
   b. "Pozzolith 300-R"; Master Builders.
   c. "Eucon Retarder 75"; Euclid Chemical Co.
   d. "Daratard"; W.R. Grace.
   e. "Plastiment"; Sika Chemical Co.

K. Calcium Chloride or admixtures containing more than 0.1% chloride ions are not permitted.

2.4 RELATED MATERIALS

A. Waterstops: Provide flat, dumbbell type or centerbulb type waterstops at construction joints and other joints as indicated, unless noted otherwise. Size to suit joints.

B. Rubber Waterstops: Corps of Engineers CRD-C 513.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
   a. The Burke Co.
   b. Progress Unlimited.
   c. Williams Products.
   d. Edoco Technical Products.
   e. Cetco

C. Polyvinyl Chloride Waterstops: Corps of Engineers CRD-C 572.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:
   a. AFCO Products.
   b. The Burke Co.
   c. Edoco Technical Products.
   d. Greenstreet Plastic Products.
   e. Harbour Town Products.
   f. W. R. Meadows.
   g. Progress Unlimited.
   h. Schleigel Corp.
   i. Vinylex Corp.

D. Vapor Retarder (Under Slab): Shall conform to ASTM E 1745, Class C or better and shall have a maximum water vapor permeance of 0.04 perms when tested in accordance with ASTM E96. Vapor retarder component no less than 10 mils thick in accordance with ACI 302, 1R-96. Products: STEGO WRAP VAPOR BARRIER (10 mil) by Stego Industries, Griffolyn T-85 by Reef Industries, or Rufco D16WB by Raven Industries or approved equal.

E. Non-Shrink Grout: CRD-C 621, factory pre-mixed grout.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
   a. Metallic:
      .1 "Vibrofoil"; A.C. Horn, Inc.
      .2 "Metallic Spec. Grout"; The Burke Co.
      .3 "Embeco 636"; Master Builders.
      .4 "Ferrolith"; Sonneborn-Contech.
      .5 "Firmix"; Euclid Chemical Co.
      .6 "Kemox G"; Sika Chemical Co.
      .7 "Ferrogrout"; L & M Const. Chemical Co.
   b. Non-metallic:
      .1 "Masterflow 713"; Master Builders.
      .2 "Sonogrout"; Sonneborn-Contech.
      .3 "Euco-NS"; Euclid Chemical Co.
      .4 "Crystex"; L & M Const. Chemical Co.
      .5 "Sure-Grip Grout"; Dayton Superior Corp.
      .6 "Horngrout"; A.C. Horn, Inc.

F. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.
   1. Waterproof paper.
   2. Polyethylene film.
   3. Polyethylene-coated burlap.

G. Liquid Membrane-Forming Curing Compound: Liquid type membrane- forming curing compound complying with ASTM C 309, Type I, Class A unless other type acceptable to Architect. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following.
   a. "Kurez DR"; Euclid Chemical Co. - or other approved equal.

H. Bonding Compound: Polyvinyl acetate or acrylic base, rewettable type.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
   a. "J-40 Bonding Agent"; Dayton Superior Corp.
   b. "Weldcrete"; Larsen Products.
   c. "Everbond"; L & M Construction Chemicals.
   d. "EucoWeld"; Euclid Chemical Co.
   e. "Hornweld"; A.C. Horn.
   f. "Sonocrete"; Sonneborn-Contech.
   g. "Acrylic Bondcrete"; The Burke Co.

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. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
   a. "Epoxtite"; A.C. Horn, Inc.
   b. "Edoco 2118 Epoxy Adhesive"; Edoco Technical Prod.
   c. "Sikadur Hi-Mod"; Sika Chemical Corp.
   d. "Euco Epoxy 463 or 615"; Euclid Chemical Co.
   e. "Patch and Bond Epoxy"; The Burke Co.
   f. "Sure-Poxy"; Kaufman Products Inc.

2.5 PROPORTIONING AND DESIGN OF 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. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing unless otherwise acceptable to Architect.

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 mixes have been reviewed by Architect.

C. Design mixes to provide normal weight concrete with the properties as indicated on the structural drawings.

D. 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; at no additional cost to Owner and 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 CONCRETE MIXES

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

B. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

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, and when air temperature is above 90 deg. F (32 deg. C), reduce mixing and delivery time to 60 minutes.

2.7 ADMIXTURES

A. Use water-reducing admixture or high range water-reducing admixture (super plasticizer) in concrete as required for placement and workability.

B. Use non-chloride accelerating admixture in concrete slabs placed at ambient temperatures below 50 deg. F (10 deg. C).

C. Use admixtures for water-reducing and set-control in strict compliance with manufacturer's directions.

D. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows:

1. Ramps, slabs, and sloping surfaces: Not more than 3".
2. Reinforced foundation systems: Not less than 1" and not more than 4".
3. Concrete containing HRWR admixture (super-plasticizer): Not more than 8" after addition of HRWR to site-verified 2"-3" slump concrete.
4. Other concrete: Not more than 4".

PART 3 EXECUTION

3.1 FORMS

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

B. Design formwork to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials.

C. 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 work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.

D. 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, to prevent swelling and for easy removal.

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

F. Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

G. Form Ties: Factory-fabricated, adjustable-length, removable or snapoff metal form ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.

1. Unless otherwise indicated, provide ties so portion remaining within concrete after removal is 1" inside concrete and will not leave holes larger than 1" diameter in concrete surface.

H. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

I. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed. Retightening forms and bracing after concrete placement is required to eliminate mortar leaks and maintain proper alignment.

3.2 PLACING REINFORCEMENT

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

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

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

D. Place reinforcement to obtain at least minimum coverages 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 as long lengths as practicable. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

3.3 JOINTS

A. Construction Joints: Locate and install construction joints as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Architect.

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

C. Place construction joints perpendicular to main reinforcement. Continue reinforcement across construction joints, except as otherwise indicated.

D. Waterstops: Provide waterstops in construction joints as indicated. Install waterstops to form continuous diaphragm in each joint. Make provisions to support and protect exposed waterstops during progress of work. Fabricate field joints in waterstops in accordance with manufacturer's printed instructions.

1. Joint filler and sealant materials are specified in Division-7 sections of these specifications.

E. Contraction (Control) Joints in Slabs-on-Ground: Construct contraction joints in slabs-on-ground as shown on structural drawings.

3.4 INSTALLATION OF EMBEDDED ITEMS

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

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

3.5 PREPARATION OF FORM SURFACES

A. Clean re-used forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.

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

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

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

3.6 CONCRETE PLACEMENT

A. Preplacement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.

B. Coordinate the installation of joint materials and moisture barriers with placement of forms and reinforcing steel.

C. General: Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete", and as herein specified.

D. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.

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

F. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309.

G. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" 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 segregation of mix.

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

I. Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.

J. Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

K. Maintain reinforcing in proper position during concrete placement operations.

L. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.

M. 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.

N. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

O. Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.

P. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.

Q. Cool ingredients before mixing to maintain concrete temperature at time of placement 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. Use of liquid nitrogen to cool concrete is Contractor's option.

R. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

S. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.

T. Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

3.7 FINISH OF FORMED SURFACES

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

B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are 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 other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.

C. Smooth Rubbed Finish: Provide smooth rubbed finish to scheduled concrete surfaces, which have received smooth form finish treatment, not later than one day after form removal.

D. Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.

E. Grout Cleaned Finish: Provide grout cleaned finish to scheduled concrete surfaces which have received smooth form finish treatment.

F. Combine one part portland cement to 1-1/2 parts fine sand by volume, and mix with water to consistency of thick paint. Proprietary additives may be used at Contractor's option. Blend standard portland cement and white portland cement, amounts determined by trial patches, so that final color of dry grout will match adjacent surfaces.

G. Thoroughly wet concrete surfaces and 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.

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

3.8 MONOLITHIC SLAB FINISHES

A. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo, and other bonded applied cementitious finish flooring material, and as otherwise indicated.

B. After placing slabs, plane surface so that depressions between high spots do not exceed 1/2" under a 10' straightedge. 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 surface to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo, and as otherwise indicated.

D. After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Check and level surface plane so that depressions between high spots do not exceed 5/16" under a 10' straightedge. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

E. Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating, system.

F. 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. The finish slab shall meet F_l 25 and F_f 25 requirements as defined by ACI 302. Grind smooth surface defects which would telegraph through applied floor covering system.

G. Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.

H. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps and ramps, and elsewhere as indicated.

I. 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.

J. Non-slip Aggregate Finish: Apply non-slip aggregate finish to concrete stair treads, platforms, ramps, sloped walks, and elsewhere as indicated.

K. After completion of float finishing, and before starting trowel finish, uniformly spread 25 lbs. of dampened non-slip aggregate per 100 sq. ft. of surface. Tamp aggregate flush with surface using a steel trowel, but do not force below surface. After broadcasting and tamping, apply trowel finishing as herein specified.

L. After curing, lightly work surface with a steel wire brush, or an abrasive stone, and water to expose non-slip aggregate.

3.9 CONCRETE CURING AND PROTECTION

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

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. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

D. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, and by combinations thereof, as herein specified.

E. Provide moisture curing by following methods:

1. Keep concrete surface continuously wet by covering with water.
2. Continuous water-fog spray.
3. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.

F. Provide moisture-cover curing as follows:

1. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape of adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

G. Provide curing and sealing compound to interior slabs with resilient flooring, carpet over cushion, or left exposed; and to exterior slabs, walks and curbs, as follows:

1. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

H. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring (such as ceramic or quarry tile, glue-down carpet), painting, and other coatings and finish materials, unless otherwise acceptable to Architect.

I. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs, and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

J. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.

K. Final cure concrete surfaces to receive liquid floor hardener or finish flooring by use of moisture-retaining cover, unless otherwise directed.

L. Sealer and Dustproofer: Apply a second coat of specified curing and sealing compound only to surfaces given a first coat.

3.10 REMOVAL OF FORMS

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

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

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

3.11 RE-USE OF FORMS

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

3.12 MISCELLANEOUS CONCRETE ITEMS

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

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and 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 certified diagrams or templates of manufacturer furnishing machines and equipment.

D. Grout base plates and foundations as indicated, using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.

3.13 CONCRETE SURFACE REPAIRS

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

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

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

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

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

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

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

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

I. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect.

J. Repair defective areas, except random cracks and single holes not exceeding 1" diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least 3/4" clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

K. Repair isolated random cracks and single holes not over 1" in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry-pack, consisting of one part portland cement to 2-1/2 parts fine aggregate passing a No. 16 mesh sieve, using only enough water as required for handling and placing. Place dry pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

L. Perform structural repairs with prior approval of Architect or Structural Engineer for method and procedure, using specified epoxy adhesive and mortar.

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

3.14 FIELD QUALITY CONTROL

A. The Owner shall employ and pay a testing laboratory to perform tests and to submit test reports. Contractor shall pay for retesting of all failed tests.

B. Sampling and testing for quality control during placement of concrete may include the following, as directed by Architect.

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

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1. Slump: ASTM C 143; one test at point of discharge for each day's pour of each type of concrete; additional tests when concrete consistency seems to have changed.
2. 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.
3. Concrete Temperature: 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 each time a set of compression test specimens made.
4. Compression Test Specimen: ASTM C 31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
5. Compressive Strength Tests: ASTM C 39; one set for each day's pour exceeding 5 cu. yds. plus additional sets for each 50 cu. yds. over and above the first 25 cu. yds. 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.
6. When frequency of testing will provide less than 5 strength tests for a given class of concrete, conduct testing from at least 5 randomly selected batches or from each batch if fewer than 5 are used.
7. When total quantity of a given class of concrete is less than 50 cu. yds., strength test may be waived by Architect if, in his judgement, adequate evidence of satisfactory strength is provided.
8. 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.
9. 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.

D. Test results will be reported in writing to Architect, Structural Engineer and Contractor within 24 hours that tests are made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.

E. 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.

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

END OF SECTION 03300

SECTION 04200 - UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

1. Concrete masonry units.
2. Face brick.
3. Mortar and grout.
4. Reinforcing steel.
5. Masonry joint reinforcement.
6. Ties and anchors.
7. Embedded flashing.
8. Cavity-wall insulation.

1.3 DEFINITIONS

A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 SUBMITTALS

A. Product Data: For each different masonry unit, accessory, and other manufactured product specified.

B. Samples for Verification: For the following:

1. Full-size units for each different exposed masonry unit required, showing the full range of exposed colors, textures, and dimensions to be expected in the completed construction.
2. Accessories embedded in the masonry.

1.5 QUALITY ASSURANCE

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, through one source from a single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

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

D. Mockups: Before installing unit masonry, build mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution. Build mockups to comply with the following requirements, using materials indicated for the completed Work:

1. Locate mockups in the locations indicated or, if not indicated, as directed by Architect.
2. Build mockups for the following types of masonry, including face and backup wythes and accessories. Exterior wall mock up shall be complete mockup showing entire wall

system (i.e. masonry ties, water proofing, and insulation board) and shall be 12' long by 12' high. Mockup shall also include the aluminum window system and sealant joints. Other requirements of mockups include:

a. Typical exterior wall shall include decorative concrete units and face brick.
b. Typical exterior wall with through-wall flashing installed for length of mockup.
c. Typical interior unit masonry wall.

3. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
4. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
5. Approved mockups of interior wall can be used in final construction.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

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

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches (600 mm) down both sides and hold cover securely in place.

2. Where one wythe of multi-wythe masonry walls is complete in advance of other wythe, secure cover a minimum of 24 " down face next to unconstructed wythe and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.

D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen substrates. Remove and replace unit masonry damaged by frost or by freezing conditions. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

1. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried, but not less than 7 days after completing cleaning.

E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required.

1. When ambient temperature exceeds 100 deg F (38 deg C), or 90 deg F (32 deg C) with a wind velocity greater than 8 mph (13 km/h), do not spread mortar beds more than 48 inches (1200 mm) ahead of masonry. Set masonry units within one minute of spreading mortar.

PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

A. General: Provide shapes indicated and as follows:

1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.

2. Provide bullnose units for outside corners (at interior partitions only), unless other wise noted.

B. Concrete Masonry Units: ASTM C 90 and as follows:

1. Weight Classification: Light weight , unless otherwise indicated
2. Provide Type II, nonmoisture-controlled units.
3. Size (Width): Manufactured to the following dimensions:

a. 4 inches (102 mm) nominal; 3-5/8 inches (92 mm) actual.
b. 8 inches (203 mm) nominal; 7-5/8 inches (194 mm) actual.

4. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.

2.2 BRICK

A. General: Provide shapes indicated and as follows for each form of brick required:

1. Provide units without cores or frogs and with exposed surfaces finished for ends of sills and caps and for similar applications that would otherwise expose unfinished brick surfaces.

B. Provide special shapes for applications requiring brick of size, form, color, and texture on exposed surfaces that cannot be produced by sawing.

1. Provide special shapes for applications where stretcher units cannot accommodate special conditions, including those at corners, movement joints, bond beams, sashes, and lintels.

C. Face Brick: ASTM C 216, Grade SW, Type FBS, and as follows:

1. Initial Rate of Absorption: Less than 20 g/30 sq. in. (20 g/194 sq. cm) per minute when tested per ASTM C 67.
2. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
3. Size: Manufactured to the following actual dimensions:

a. Modular: 3-1/2 to 3-5/8 inches (89 to 92 mm) wide by 2-1/4 inches (57 mm) high by 7-1/2 to 7-5/8 inches (190 to 194 mm) long.

4. Application: Use where brick is exposed, unless otherwise indicated.
5. Color and Texture: Match Architect's samples.
6. Products: Subject to compliance with requirements, products that may be incorporated into the Work include the following:

a. 10-200, Boral Bricks (Field Color); 10-910, Boral (Accent Color)

b. Blend 230, Boston Red; Acme Brick (Field Color); _____, Acme Brick (Accent Color);

2.3 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color indicated.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: Packaged blend of portland cement complying with ASTM C 150, Type I or Type III, and hydrated lime complying with ASTM C 207.

D. Mortar Cement: ASTM C 1329.

E. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch (6.5 mm) thick, use aggregate graded with 100 percent passing the No. 16 (1.18-mm) sieve.

F. Aggregate for Grout: ASTM C 404.

G. Water-Repellent Admixture: Liquid water-repellent mortar admixture intended for use with concrete masonry units, containing integral water repellent by same manufacturer.

H. Water: Potable.

I. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Mortar Cement:

   a. Magnolia Superbond Mortar Cement; Blue Circle Cement.
   b. Lafarge Mortar Cement; Lafarge Corporation.

2. Water-Repellent Admixture:

   a. Mortar Tite; Addiment Inc.
   b. Dry-Block Mortar Admixture; W. R. Grace & Co., Construction Products Division.
   c. Rheopel; Master Builders.

2.4 REINFORCING STEEL

A. Uncoated Steel Reinforcing Bars: ASTM A 615/A 615M; ASTM A 616/A 616M, including Supplement 1; or ASTM A 617/A 617M, Grade 60 (Grade 400).

2.5 MASONRY JOINT REINFORCEMENT

A. General: ASTM A 951 and as follows:

1. Hot-dip galvanized, carbon-steel wire for both interior and exterior walls.
2. Wire Size for Side Rods: W2.8 or 0.188-inch (4.8-mm) diameter.
3. Wire Size for Cross Rods: W2.8 or 0.188-inch (4.8-mm) diameter.
4. Provide in lengths of not less than 10 feet (3 m), with prefabricated corner and tee units where indicated.

B. For single-wythe masonry, provide either ladder or truss type with single pair of side rods and cross rods spaced not more than 16 inches (407 mm) o.c.

C. For multiwythe masonry, provide types as follows:

1. Adjustable (2-piece) type with single pair of side rods and cross ties spaced not more than 16 inches (407 mm) o.c. and with separate adjustable veneer ties engaging the cross ties. Cross ties are either U-shaped with eyes or rectangular. Space side rods for embedment within each face shell of backup wythe and size adjustable ties to extend at least halfway through outer wythe but with at least 5/8-inch (16-mm) cover on outside face. Use where facing wythe is of different material than backup wythe.

2.6 TIES AND ANCHORS, GENERAL

A. General: Provide ties and anchors, specified in subsequent articles, made from materials that comply with this Article, unless otherwise indicated.

B. Hot-Dip Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.

C. Steel Sheet, Galvanized after Fabrication: ASTM A 366/A 366M cold-rolled, carbon-steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153.

2.7 BENT WIRE TIES

A. General: Rectangular units with closed ends and not less than 4 inches (100 mm) wide. Z-shaped ties with ends bent 90 degrees to provide hooks not less than 2 inches (50 mm) long may be used for masonry constructed from solid units or hollow units laid with cells horizontal.

B. Wire: Fabricate from 3/16-inch- (4.8-mm-) diameter, hot-dip galvanized steel wire.

2.8 ADJUSTABLE ANCHORS FOR CONNECTING TO STEEL FRAME

A. General: Provide two-piece assemblies that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

1. Anchor Section: Crimped 1/4-inch- (6.4-mm-) diameter, hot-dip galvanized steel wire anchor section for welding to steel.

2. Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch (25 mm) of masonry face, made from 0.1875-inch- (4.8-mm-) diameter, hot-dip galvanized steel stainless-steel wire.

2.9 ADJUSTABLE MASONRY-VENEER ANCHORS

A. General: Provide two-piece assemblies that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall, for attachment over sheathing to wood or metal studs, and as follows:

1. Structural Performance Characteristics: Capable of withstanding a 100-lbf (445-N) load in both tension and compression without deforming or developing play in excess of 0.05 inch (1.3 mm).

B. Screw-Attached, Masonry-Veneer Anchors: Units consisting of a wire tie section and a metal anchor section complying with the following requirements:

1. Anchor Section: Sheet metal plate with screw holes top and bottom and with raised rib-stiffened strap stamped into center to provide a slot between strap and plate for connection of wire tie.

a. Plate 1-1/4 inches (32 mm) wide by 6 inches (150 mm) long with strap 5/8 inch (16 mm) wide by 3-5/8 inches (92 mm) long; slot clearance formed between face of plate and back of strap shall not exceed diameter of wire tie by more than 1/32 inch (0.8 mm).

2. Wire Tie Section: Rectangular shaped wire tie sized to extend at least halfway through veneer but with at least 5/8-inch (16-mm) cover on outside face.

3. Fabricate sheet metal anchor sections and other sheet metal parts from 0.0677-inch- (1.7-mm-) thick, steel sheet, galvanized after fabrication.

4. Fabricate wire tie sections from 0.1875-inch- (4.8-mm-) diameter, hot-dip galvanized steel wire.

C. Steel Drill Screws for Steel Studs: ASTM C 954 except manufactured with hex washer head and neoprene washer, No. 10 (4.8-mm) diameter by length required to penetrate steel stud flange by not less than 3 exposed threads, and with the following corrosion protective coating:

1. Organic polymer coating with salt-spray resistance to red rust of more than 800 hours per ASTM B 117.

D. Stainless-Steel Drill Screws for Steel Studs: Proprietary fastener consisting of carbon-steel drill point and 300 Series stainless-steel shank, complying with ASTM C 954 except manufactured with hex washer head and neoprene washer, No. 10 (4.8-mm) diameter by length required to penetrate steel stud flange by not less than three exposed threads.

E. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

1. Screw-Attached, Masonry-Veneer Anchors:

a. 315-D with 316; Heckman Building Products, Inc.
b. 252 ; Heckman Building Products, Inc.
c. DW-10HS; Hohmann & Barnard, Inc.
d. Box tie with drip; Hohmann & Barnard, Inc.

2. Stainless-Steel Drill Screws for Steel Studs:

a. By manufacturer of anchor.

2.10 EMBEDDED FLASHING MATERIALS

A. Contractor's Option for Concealed Flashing: For flashing partly exposed to the exterior, use metal flashing specified above. For flashing not exposed to the exterior, use one of the following, unless otherwise indicated:

1. Copper-Laminated Flashing: Manufacturer's standard laminated flashing consisting of 5-oz./sq. ft. (1.5-kg/sq. m) sheet copper bonded with asphalt between 2 layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry.
2. Asphalt-Coated Copper Flashing: Manufacturer's standard product consisting of 5-oz./sq. ft. (1.5-kg/sq. m) sheet copper coated with flexible asphalt. Use only where flashing is fully concealed in masonry.

B. Adhesives, Primers, and Seam Tapes for Flashings: Flashing manufacturer's standard products or products recommended by the flashing manufacturer for bonding flashing sheets to each other and to substrates.

C. Products: Subject to compliance with requirements, products that may be incorporated into the Work include the following:

1. Copper-Laminated Flashing:

a. Copper Fabric; AFCO Products, Inc.
b. H & B C-Fab Flashing; Hohmann & Barnard, Inc.
c. Copper Fabric Flashing; Polytite Manufacturing Corp.
d. York Copper Fabric Flashing; York Manufacturing, Inc.

2. Asphalt-Coated Copper Flashing:

a. Cop-A-Cote; AFCO Products, Inc.
b. H & B C-Coat Flashing; Hohmann & Barnard, Inc.
c. Coated Copper Flashing; Polytite Manufacturing Corp.
d. Copperseal; York Manufacturing, Inc.

2.11 CAVITY-WALL INSULATION

A. Polyisocyanurate Board Insulation: Aluminum-foil-faced, glass-fiber-reinforced, rigid, cellular, polyisocyanurate thermal insulation complying with ASTM C 1289, Type I, Class 2. Thickness as indicated on drawings.

B. Adhesive: Type recommended by insulation board manufacturer for application indicated.

2.12 MORTAR AND GROUT MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.

1. Do not use calcium chloride in mortar or grout.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification.

1. Limit cementitious materials in mortar to portland cement, mortar cement, and lime.
2. For reinforced masonry and where indicated, use Type S.
3. For exterior, above-grade, load-bearing and non-load-bearing walls and parapet walls; for interior load-bearing walls; for interior non-load-bearing partitions; and for other applications where another type is not indicated, use Type N.

C. Grout for Unit Masonry: Comply with [ASTM C 476].

1. Use grout of type indicated or, if not otherwise indicated, of type (fine or coarse) that will comply with Table 5 of ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
2. Provide grout with a slump of 8 to 11 inches (200 to 280 mm) as measured according to ASTM C 143.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

1. Verify that foundations are within tolerances specified.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

B. Before installation, examine rough-in and built-in construction to verify actual locations of piping connections.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this Section and in other Sections of the Specifications.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to the opening.

D. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide a continuous pattern and to fit adjoining construction. Where possible, use full-size units without cutting. Allow units cut with water-cooled saws to dry before placing, unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

1. Mix units from several pallets or cubes as they are placed.

F. Wetting of Brick: Wet brick before laying if the initial rate of absorption exceeds 30 g/30 sq. in. (30 g/194 sq. cm) per minute when tested per ASTM C 67. Allow units to absorb water so they are damp but not wet at the time of laying.

3.3 CONSTRUCTION TOLERANCES

A. Comply with tolerances in ACI 530.1/ASCE 6/TMS 602 and the following:

B. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.

C. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet (6 mm in 3 m), nor 1/2 inch (12 mm) maximum.

D. For conspicuous horizontal lines, such as exposed lintels, sills, parapets, and reveals, do not vary from level by more than 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch (12 mm) maximum.

E. For exposed bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm). Do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch (3 mm).

F. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch (3 mm).

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

1. One-half running bond with vertical joints in each course centered on units in course above and below, unless otherwise noted.

C. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches (50 mm). Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

D. Stopping and Resuming Work: In each course, rack back one-half-unit length for one-half running bond or one-third-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar before laying fresh masonry.

E. Built-in Work: As construction progresses, build in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

F. Fill space between hollow-metal frames and masonry solidly with mortar, unless otherwise indicated.

G. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.

H. Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

I. Build non-load-bearing interior partitions full height of story to underside of roof structure above. At metal deck roof structure, utilize one of the following:

1. Install compressible filler in joint between top of partition and underside of structure above.
2. At fire-rated partitions, install firestopping in joint between top of partition and underside of structure above to comply with Division 7 Section "Firestopping."

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow masonry units as follows:

1. With full mortar coverage on horizontal and vertical face shells.
2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.

B. Lay solid brick-size masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

1. At cavity walls, bevel beds away from cavity, to minimize mortar protrusions into cavity. As work progresses, trowel mortar fins protruding into cavity flat against the cavity face of the brick.

C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than the joint thickness, unless otherwise indicated.

D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint), unless otherwise indicated.

3.6 CAVITIES

A. Keep cavities clean of mortar droppings and other materials during construction. Strike joints facing cavities flush.

1. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.

B. Coat cavity face of backup wythe to comply with Division 7 Section "Bituminous Dampproofing."

C. Installing Cavity-Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches (300 mm) o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.

1. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

3.7 MASONRY JOINT REINFORCEMENT

A. General: Provide continuous masonry joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcement a minimum of 6 inches (150 mm).

1. Space reinforcement not more than 16 inches (406 mm) o.c.

2. In addition to continuous reinforcement, provide reinforcement not more than 8” above and below wall openings and extending 12” beyond openings.

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcing units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.8 ANCHORING MASONRY TO STRUCTURAL MEMBERS

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

1. Provide an open space not less than 1 inch (25 mm) in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.

2. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure.

3. Space anchors as indicated, but not more than 24 inches (610 mm) o.c. vertically and 36 inches (915 mm) o.c. horizontally.

3.9 ANCHORING MASONRY VENEERS

A. Anchor masonry veneers to concrete and masonry backup with masonry-veneer anchors to comply with the following requirements:

1. Embed connector sections and continuous wire in masonry joints. Provide not less than 2 inches (50 mm) of air space between back of masonry veneer and face of sheathing.
2. Locate anchor sections to allow maximum vertical differential movement of ties up and down.
3. Space anchors as indicated, but not more than 16 inches (406 mm) o.c. vertically and 24 inches (610) o.c. horizontally with not less than 1 anchor for each 2.67 sq. ft. (0.25 sq. m) of wall area. Install additional anchors within 12 inches (305 mm) of openings and at intervals, not exceeding 36 inches (914 mm), around perimeter.

3.10 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joints in unit masonry where indicated, but not more than 30 feet on center. In addition, provide control joints in concrete masonry where concrete masonry walls bypass adjacent structural steel columns. Coordinate the location of control/expansion joints with Architect prior to beginning masonry installation. Build-in related items as masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.

B. Form control joints in concrete masonry as follows:

1. Install temporary foam-plastic filler in head joints and remove filler when unit masonry is complete. Form open joint of width indicated, but not less than 3/8 inch (10 mm) for installation of sealant and backer rod specified in Division 7 Section "Joint Sealants."

C. Form control/expansion joints in brick made from clay or shale as indicated on exterior elevations (maximum 30 feet on center) and as follows:

1. Form open joint of width indicated, but not less than 3/8 inch (10 mm) for installation of sealant and backer rod specified in Division 7 Section "Joint Sealants." Keep joint free and clear of mortar.

D. Build in horizontal, pressure-relieving joints where indicated; construct joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Division 7 Section "Joint Sealants."

1. Locate horizontal, pressure-relieving joints beneath shelf angles supporting masonry veneer and attached to structure behind masonry veneer.

3.11 LINTELS

A. Install steel lintels where indicated.

B. Provide minimum bearing of 8 inches (200 mm) at each jamb, unless otherwise indicated.

C. Provide masonry lintels where shown and where openings of more than 12 inches (305 mm) for brick-size units and 24 inches (610 mm) for block-size units are shown without structural steel or other supporting lintels. Refer to structural drawings for additional information.

1. Provide prefabricated or built-in-place masonry lintels. Use specially formed bond beam units with reinforcing bars placed as indicated and filled with coarse grout. Cure precast lintels before handling and installing. Temporarily support built-in-place lintels until cured.

3.12 FLASHING, WEEP HOLES, AND VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

B. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Unless otherwise indicated, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.

C. Install flashing as follows:

1. At masonry-veneer walls, extend flashing from exterior face of veneer, through veneer, up face of sheathing at least 8 inches (200 mm), and behind air-infiltration barrier or building paper.

2. At multiwythe masonry walls, including cavity walls, extend flashing from exterior face of outer wythe of masonry, through outer wythe, turned up a minimum of **8 inches** and through inner wythe to within 1/2 inch (13 mm) of the interior face of the wall in exposed masonry. Where interior surface of inner wythe is concealed by furring, carry flashing completely through inner wythe and turn flashing up approximately 2 inches (50 mm), unless otherwise indicated.

3. At lintels and shelf angles, extend flashing a minimum of 4 inches (100 mm) into masonry at each end. At heads and sills, extend flashing 4 inches (100 mm) at ends and turn flashing up not less than 2 inches (50 mm) to form a pan.

4. Cut flashing off flush with face of wall after masonry wall construction is completed.

D. Install weep holes in the head joints in exterior wythes of the first course of masonry immediately above embedded flashing and as follows:

1. Use open head joint to form weep holes.

2. Space weep holes 24 inches (600 mm) o.c.

3. In cavities, place pea gravel to a height equal to height of first course, but not less than 2 inches (50 mm), immediately above top of flashing embedded in the wall, as masonry construction progresses, to splatter mortar droppings and to maintain drainage.

E. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

3.13 REINFORCED UNIT MASONRY INSTALLATION

A. Temporary Formwork and Shores: Construct formwork and shores to support reinforced masonry elements during construction.

1. Construct formwork to conform to shape, line, and dimensions shown. Make it sufficiently tight to prevent leakage of mortar and grout. Brace, tie, and support forms to maintain position and shape during construction and curing of reinforced masonry.

2. Do not remove forms and shores until reinforced masonry members have hardened sufficiently to carry their own weight and other temporary loads that may be placed on them during construction.

B. Placing Reinforcement: Comply with requirements of ACI 530.1/ASCE 6/TMS 602.

C. Grouting: Do not place grout until entire height of masonry to be grouted has attained sufficient strength to resist grout pressure.

1. Comply with requirements of ACI 530.1/ASCE 6/TMS 602 for cleanouts and for grout placement, including minimum grout space and maximum pour height.

3.14 FIELD QUALITY CONTROL

A. Owner will engage a qualified independent testing agency to perform field quality-control testing indicated below.

1. Payment for these services will be made by Owner.
2. Retesting of materials failing to meet specified requirements shall be done at Contractor's expense.

B. Mortar properties will be tested per [ASTM C 780].

C. Grout will be sampled and tested for compressive strength per [ASTM C 1019].

3.15 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain on exposed surfaces.
4. Properly and legally dispose of all waste.

END OF SECTION 04200

SECTION 05120 - STRUCTURAL STEEL

PART 1 GENERAL

1.1 SUMMARY

A. This section includes the following:

1. Extent of structural steel work is shown on drawings, including schedules, notes and details to show size and location of members, typical connections, and type of steel required.
2. Structural steel is that work defined in American Institute of Steel Construction (AISC) "Code of Standard Practice" and as otherwise shown on drawings.
3. Miscellaneous Metal Fabrications are specified elsewhere in Division 5.
4. Refer to Division 3 for anchor bolt installation in concrete.
5. Source Quality Control: Materials and fabrication procedures are subject to inspection and tests in mill, shop, and field, conducted by a qualified inspection agency. Such inspections and tests will not relieve Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements.
   a. Promptly remove and replace materials or fabricated components which do not comply.
6. Design of Members and Connections: Details shown are typical; similar details apply to similar conditions, unless otherwise indicated. Verify dimensions at site whenever possible without causing delay in the work.
   a. Promptly notify Architect, prior to bid, whenever design of members and connections for any portion of structure are not clearly indicated.

1.2 SUBMITTALS

A. Product Data: Submit producer's or manufacturer's specifications and installation instructions for following products. Include laboratory test reports and other data to show compliance with specifications (including specified standards).

1. Structural steel (each type), including certified copies of mill reports covering chemical and physical properties.
2. High-strength bolts (each type), including nuts and washers.
3. Structural steel primer paint.
4. Shrinkage-resistant grout.

B. Shop Drawings: Submit shop drawings prepared under the supervision of a registered professional engineer, including complete details and schedules for fabrication and assembly of structural steel members, procedures and diagrams.

C. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS A2.1 and A2.4 symbols, and show size, length, and type of each weld.

1. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed as work of others sections.

D. Test Reports: Submit copies of reports of tests conducted on shop and field bolted and welded connections. Include data on type(s) of tests conducted and test results.

1.3 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of following, except as otherwise indicated:

1. AISC "Code of Standard Practice for Steel Buildings and Bridges".
2. AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings", including the "Commentary" and Supplements thereto as issued.

3. AISC "Specifications for Architecturally Exposed Structural Steel".
4. AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.
5. American Welding Society (AWS) D1.1 "Structural Welding Code - Steel".
6. "ASTM A 6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use".

B. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure".

C. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests.

1. If recertification of welders is required, retesting will be Contractor's responsibility.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site in such intervals to insure uninterrupted progress of work.

B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time to not delay work.

C. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration.

D. 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.

PART 2 PRODUCTS

2.1 MATERIALS

A. Metal Surfaces, General: For fabrication of work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, rust and scale seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating and application of surface finishes.

B. Structural Steel Shapes, Plates and Bars: ASTM A 572 - Grade 50 or ASTM A 992.

C. Cold-Formed Steel Tubing: ASTM A 500, Grade B.

D. Hot-Formed Steel Tubing: ASTM A 501.

E. Steel Pipe: ASTM A 53, Type E or S, Grade B; or ASTM A 501.

1. Finish: Black, except where indicated to be galvanized.

F. Steel Castings: ASTM A 27, Grade 65-35, medium-strength carbon steel.

G. Anchor Bolts: ASTM A 307, nonheaded type unless otherwise indicated.

H. Unfinished Threaded Fasteners: ASTM A 307, Grade A, regular low-carbon steel bolts and nuts.

1. Provide hexagonal heads and nuts for all connections.

I. Electrodes for Welding: Comply with AWS Code - use E70XX unless noted otherwise - minimum 1/4" fillet welds.

J. Structural Steel Primer Paint: Fabricators standard rust inhibiting primer. Primer shall be compatible with any specified sprayed-on fireproofing. (See Architect)

K. Metallic Shrinkage-Resistant Grout: Pre-mixed factory-packaged ferrous aggregate grouting compound.

1. Available Projects: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
   a. Firmix; Euclid Chemical Co.
   b. Embeco 153; Master Builders.
   c. Ferrolith G; Sonneborn/Contech.
   d. Irontox; Toch Brothers.
   e. Kemox C; Sika Chemical.
   f. Vibra-Foil; W. R. Grace.

L. Non-metallic Shrinkage-Resistant Grout: Pre-mixed, non-metallic, non-corrosive, non-staining product containing selected silica sands, portland cement, shrinkage compensating agents, plasticizing and water reducing agents, complying with CE-CRD-C621.

1. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:
   a. Euco N.S.; Euclid Chemical Co.
   b. Crystex; L&M Construction Chemicals.
   c. Masterflow 713; Master Builders.
   d. Five Star Grout; U.S. Grout Corp.
   e. Upcon; Upco Chem. Div., USM Corp.
   f. Propak; Protex Industries, Inc.
   g. Set Non-Shrink; Set Products, Inc.

M. Connection Bolts: 3/4" diameter A325-N bolts with twist-off tension indicators.

2.2 FABRICATION

A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.

B. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.

C. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.

D. Connections: Weld or bolt shop connections, as indicated.

E. Bolt field connections, except where welded connections or other connections are indicated.

1. Provide high-strength threaded fasteners for principal bolted connections - 3/4" diameter A325-N bolts with twist-off tension indicators.

F. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work.

G. Assemble and weld built-up sections by methods which will produce true alignment of axis without warp.

H. Holes for Other Work: Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members, as shown on final shop drawings.

I. Provide threaded nuts welded to framing, and other specialty items as indicated to receive other work.

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

2.3 SHOP PAINTING

A. General: Shop paint structural steel, except those members or portions of members to be embedded in concrete or mortar. Paint embedded steel which is partially exposed on exposed portions and initial 2" of embedded areas only.

1. Do not paint surfaces which are to be welded or high-strength bolted with friction-type connections.
2. Apply 2 coats of paint to surfaces which are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

B. Surface Preparation: After inspection and before shipping, clean steelwork to be painted. Remove loose rust, loose mill scale, and spatter, slag or flux deposits. Clean steel in accordance with Steel Structures Painting Council (SSPC) as follows:

1. SP-1 "Solvent Cleaning".
2. SP-2 "Hand Tool Cleaning".
3. SP-3 "Power Tool Cleaning".
4. SP-5 "White Metal Blast Cleaning".

C. Painting: Immediately after surface preparation, apply structural steel primer paint in accordance with manufacturer's instructions and at a rate to provide a uniform dry film thickness of not less than 1.5 mils. Use painting methods which result in full coverage of joints, corners, edges and exposed surfaces.

D. Painting: Provide a one-coat shop applied paint system complying with Steel Structures Painting Council (SSPC) - Paint System Guide 7.00.

PART 3 EXECUTION

3.1 ERECTION

A. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guy lines to achieve proper alignment of structures as erection proceeds.

B. Setting Bases and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of base and bearing plates.

C. Set loose and attached base plates and bearing plates for structural members on wedges or other adjusting devices.

D. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.

E. Pack grout solidly between bearing surfaces and bases of plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.

1. For proprietary grout materials, comply with manufacturer's instructions.

F. Field Assembly: Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming a part of a complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

G. Level and plumb individual members of structure within specified AISC tolerances.

H. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.

I. Splice members only where indicated and accepted on shop drawings.

J. Erection Bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds and grind smooth at exposed surfaces.

K. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

L. Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.

M. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members which are not under stress, as acceptable to Architect. Finish gas-cut sections equal to a sheared appearance when permitted.

N. Touch-Up Painting: Immediately after erection erector shall clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting.

O. Apply by brush or spray to provide a minimum dry film thickness of 1.5 mils.

3.2 FIELD QUALITY CONTROL

A. Engage an independent testing and inspection agency to inspect high-strength bolted connections and welded connections and to perform tests and prepare test reports. Testing shall be paid for by Owner. Inspector to visually inspect bolted and welded connections and check to see that all connection bolts are installed and tension indicators have been twisted off. Inspector shall also inspect and ping all shear studs prior to placing concrete.

B. Testing agency shall conduct and interpret tests and state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.

C. Provide access for testing agency to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.

D. Testing agency may inspect structural steel at plant before shipment; however, Architect reserves right, at any time before final acceptance, to reject material not complying with specified requirements.

E. Correct deficiencies in structural steel work which inspections and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense,

as may be necessary to reconfirm any non-compliance of original work, and as may be necessary to show compliance of corrected work.

F. Shop Bolted Connections: Inspect in accordance with AISC specifications.

G. Shop Welding: Inspect and test during fabrication of structural steel assemblies, as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
2. Perform visual inspection of all welds.
3. Perform tests of welds as follows. Inspection procedures listed are to be used at Contractor's option.
4. Liquid Penetrant Inspection: ASTM E 165.
5. Magnetic Particle Inspection: ASTM E 109; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration not acceptable.
6. Radiographic Inspection: ASTM E 94 and ASTM E 142; minimum quality level "2-2T".
7. Ultrasonic Inspection: ASTM E 164.

H. Field Bolted Connections: Inspect in accordance with AISC specifications.

I. Field Welding: Inspect and test during erection of structural steel as follows:

1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
2. Perform visual inspection of all welds.
3. Perform tests of welds as follows as required:
   a. Liquid Penetrant Inspection: ASTM E 165.
   b. Magnetic Particle Inspection: ASTM E 109; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration not acceptable.
   c. Radiographic Inspection: ASTM E 94 and ASTM E 142; minimum quality level "2-2T".
   d. Ultrasonic Inspection: ASTM E 164.

END OF SECTION 05120

SECTION 05210 - STEEL JOISTS

PART 1 - GENERAL

1.1_ RELATED DOCUMENTS

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

1.2 SUMMARY

A. Extent of steel joists is shown on drawings, including basic layout and type of joist required.

1.3 SUBMITTALS

A. Product Data: Submit detailed drawings, showing layout of joist units, special connections, joining and accessories. Include mark, number, type, location and spacing of joists and bridging.

1. Provide templates or location drawings for installation of anchor bolts and metal bearing plates.

1.4 QUALITY ASSURANCE

A. Provide joists fabricated in compliance with the following, and as herein specified.

1. Steel Joist Institute (SJI) AStandard Specifications, Load Tables and Weight Tables@ for:
   a. K-Series Open Web Steel Joists.
   b. LH-Series Steel Joists.

B. Qualification of Field Welding: Qualify welding processes and welding operators in accordance with American Welding Society Structural Welding Code, AAWS D1.1.

C. Inspection: Inspection joist in accordance with SJI specifications.

D. Performance Test: If required, conduct performance tests in accordance with procedures described in SJI ARecommended Code of Standard Practice@.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle steel joists as recommended in SJI ASpecifications@. Handle and store joists in a manner to avoid deforming members and to avoid excessive stresses.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel: Comply with SJI ASpecifications@.
B. Steel Prime Paint: Comply with SJI ASpecifications@.

2.2 FABRICATION

A. General: Fabricate steel joists in accordance with SJI ASpecification@.

B. Holes in Chord Members: Provide holes in chord members where shown for securing other work to steel joists; however, deduct area of holes from the area of chord when calculating strength of member.
C. Extended Ends: Provide extended ends on joist where shown, complying with manufacturer=s standards and requirements of applicable SJI ASpecifications@ and load tables.

D. Ceiling Extensions: Provide ceiling extensions in areas having ceilings attached directly to joist bottom chord. Provide either an extended bottom chord element or a separate unit, to suit manufacturer=s standards, of sufficient strength to support ceiling construction. Extend ends to within 2" of finished wall surface unless otherwise indicated.

E. Bridging: Provide horizontal or diagonal type bridging for joists, complying with SJI ASpecifications@.

F. Shop Painting: Remove loose scale, heavy rust, and other foreign materials form fabricated joists and accessories before application of shop paint.

G. Apply one shop coat of steel prime paint to joists and accessories, by spray, dipping, or other method to provide a continuous dry paint film thickness of not less than 1.0 mil.

PART 3 - EXECUTION

3.1 ERECTION

A. Place and secure steel joists, in accordance with SJI ASpecifications@, final shop drawings, and as herein specified.

B. Anchors: Furnish anchor bolts, bearing plates, and other devices to be built into concrete and masonry construction.

1. Refer to Division-3 sections for installation of anchors set in concrete.

C. Placing Joists: Do not start placement of steel joists until supporting work is in place and secured. Place joists on supporting work, adjust and align in accurate locations and spacing before permanently fastening.

D. Provide temporary bridging, connections and anchors to ensure lateral stability during

construction.

E. Bridging: Install bridging simultaneously with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords where terminating at walls or beams.

3.2 FASTENING JOISTS

A. Field weld joists to supporting steel framework in accordance with SJI ASpecifications@ for type of joists used. Coordinate welding sequence and procedure with placing of joists.

B. Touch-Up Painting: After joist installation, erector shall paint field boltheads and nuts, and welded areas, abraded or rusty surfaces on joists and steel supporting members. Wire brush surfaces and clean with solvent before painting. Use same type of paint as used for shop painting.

END OF SECTION 05210

SECTION 05300 - METAL DECKING

PART 1 GENERAL

1.1 SUMMARY

A. This section includes the following:

1. Extent of metal decking is indicated on the drawings, including basic layout and type of deck units required.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's specifications and installation instructions for each type of decking and accessories. Include manufacturer's certification as may be required to show compliance with these specifications.

B. Shop Drawings: Submit detailed drawings showing layout and types of deck panels, anchorage details, and conditions requiring supplementary framing, sump pans, cant strips, cut openings special jointing, and other accessories. Deck supplier shall provide girder fillers, column closures, pour stops and supplementary framing as required to produce a complete deck installation.

C. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance.

1.3 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following codes and standards, except as otherwise indicated:

1. AISI "Specification for the Design of Cold-Formed Steel Structural Members."
2. SDI "Design Manual for Floor Decks and Roof Decks."

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include but are not limited to the following:

1. Metal Floor Deck Units:
2. Consolidated Systems, Inc.
3. Mac-Fab Products, Inc.
4. Roll Form Products, Inc.
5. United Steel Deck, Inc.
6. Vulcraft Div., Nucor Corp.
7. Wheeling Corrugating Co.

2.2 MATERIALS

A. Steel for Galvanized Metal Deck Units: ASTM A 446, Grade A.

B. Miscellaneous Steel Shapes: ASTM A 36.

C. Sheet Metal Accessories: ASTM A 526, commercial quality, galvanized.

D. Galvanizing: ASTM A 525, G60.

E. Galvanizing Repair Paint: High zinc-dust content paint for repair of damaged galvanized surfaces complying with Military Specifications MIL-P-21035 (Ships).

2.3 FABRICATION

A. General: Form deck units in lengths to span three or more supports, with flush, laps at ends and interlocking side laps, unless otherwise indicated.

PART 3 EXECUTION

3.1 INSTALLATION

A. General: Install deck units and accessories in accordance with manufacturer's recommendations and final shop drawings, and as specified herein.

B. Place deck units on supporting steel framework and adjust to final position with ends accurately aligned and bearing on supporting members before being permanently fastened. Do not stretch or contract side lap interlocks.

C. Place deck units in straight alignment for entire length of run of cells and with close alignment between cells at ends of abutting units.

D. Place deck units flat and square, secured to adjacent framing without warp or excessive deflection.

E. Do not place deck units on concrete supporting structure until concrete has cured and is dry.

F. Coordinate and cooperate with structural steel erector in locating decking bundles to prevent overloading of structural members.

G. Do not use deck units for storage or working platforms until permanently secured.

H. Fastening Deck Units: Fasten deck units to steel supporting members in accordance with manufacturer's specifications and as specified on Structural Drawings.

I. Cutting and Fitting: Cut and neatly fit deck units and accessories around other work projecting through or adjacent to the decking, as shown.

J. Reinforcement at Openings: Provide, column closures, girder fillers, and, additional metal reinforcement and closure pieces, etc., as required for strength, continuity of decking and support of other work shown.

K. Closure Strips: Provide metal closure strips at open uncovered ends and edges of decking, and in voids between decking and other construction. Weld into position to provide a complete decking installation.

L. Touch-Up Painting: After decking installation, wire brush, clean, and paint scarred areas, welds, and rust spots on top and bottom surfaces of decking units and supporting steel members.

1. Touch-up galvanized surfaces with galvanizing repair paint applied in accordance with manufacturer's instructions.

M. In areas where shop-painted surfaces are to be exposed, apply touch-up paint to blend into adjacent surfaces.

END OF SECTION 05300

SECTION 05400 - COLD-FORMED METAL FRAMING

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. Exterior non-load-bearing curtain-wall framing.
2. Gypsum sheathing and air-infiltration barriers.

1.3 DEFINITIONS

A. Minimum Uncoated Steel Thickness: Minimum uncoated thickness of cold-formed framing delivered to the Project site shall be not less than 95 percent of the thickness used in the cold-formed framing design. Lesser thicknesses shall be permitted at bends due to cold forming.

B. Producer: Entity that produces steel sheet coil fabricated into cold-formed members.

1.4 SUBMITTALS

A. Product Data: For each type of cold-formed metal framing product and accessory indicated.

B. Welding Certificates: Copies of certificates for welding procedures and personnel.

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.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed cold-formed metal framing similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."

C. AISI Specifications: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members" for calculating structural characteristics of cold-formed metal framing[.][:]

1. CCFSS Technical Bulletin: "AISI Specification Provisions for Screw Connections."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Store cold-formed metal framing, protect with a waterproof covering, and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide cold-formed metal framing by one of the following:

1. Clark Steel Framing Industries.
2. Dale Industries, Inc.
3. Dietrich Industries, Inc.
4. MarinoWare; Div. of Ware Industries, Inc.
5. Unimast, Inc.

2.2 MATERIALS

A. Steel Sheet: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
1. Grade: 33 (230)
2. Coating: G90 (Z275).

2.3 NON-LOAD-BEARING CURTAIN-WALL FRAMING

A. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, complying with ASTM C 955, and as follows:

1. Minimum Uncoated-Steel Thickness: 0.0428 inch (1.09 mm)
2. Flange Width: 1-5/8 inches (35 mm)
3. Depth of Stud: As indicated on drawings.

B. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with unstiffened flanges, complying with ASTM C 955, and as follows:

1. Minimum Uncoated-Steel Thickness: Matching steel studs.
2. Flange Width: 1-1/4 inches (32 mm).

2.4 FRAMING ACCESSORIES

A. Fabricate steel-framing accessories of the same material and finish used for framing members, with a minimum yield strength of 33,000 psi (230 MPa).

B. Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:

1. Supplementary framing.
2. Bracing, bridging, and solid blocking.
3. Web stiffeners.
4. End clips.
5. Stud kickers, knee braces, and girts.

2.5 ANCHORS, CLIPS, AND FASTENERS

A. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123.

B. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel hex-headed and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.

C. Mechanical Fasteners: Corrosion-resistant-coated, self-drilling, self-threading steel drill screws.

1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

D. Welding Electrodes: Comply with AWS standards.

2.6 MISCELLANEOUS MATERIALS

A. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035.

2.7 GYPSUM SHEATHING

A. Glass-Mat Gypsum Sheathing Board: ASTM C 1177/C 1177M.

1. Type and Thickness: Regular, 5/8 inch (12.7 mm) thick.
2. Size: 48 by 96 inches (1219 by 2438 mm).
3. Product: Subject to compliance with requirements, provide "Dens-Glass Gold" by Georgia-Pacific Corp.

2.8 SHEATHING ACCESSORIES

A. Fasteners: Steel drill screws, ASTM C 954, in length recommended by sheathing manufacturer for thickness of sheathing board to be attached, with organic-polymer or other corrosion-protective coating having a salt-spray resistance of more than 800 hours according to ASTM B 117.

B. Silicone Emulsion Sealant for Glass-Mat Gypsum Sheathing: Product complying with ASTM C 834, compatible with sheathing tape and gypsum sheathing, recommended by sheathing and tape manufacturers for use with glass-fiber sheathing tape and for covering exposed fasteners.

1. Product: Subject to compliance with requirements, provide "Elmer's Siliconized Acrylic Latex Caulk" by Borden, Inc.

C. Glass-Fiber Sheathing Tape for Glass-Mat Gypsum Sheathing: Self-adhering glass-fiber tape, minimum 2 inches (50 mm) wide, 10 by 10 or 10 by 20 threads per inch (390 by 390 or 390 by 780 threads per meter), of type recommended by sheathing and tape manufacturers for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing board and with a history of successful in-service use.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Perma-Tite Tape--PGM 207A; PermaGlas-Mesh, Inc.
b. Quik-Tape; Quik-Tape, Inc.

2.9 FABRICATION

A. Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer's written recommendations and requirements in this Section.

1. Fabricate framing assemblies using jigs or templates.
2. Cut framing members by sawing or shearing; do not torch cut.
3. Fasten cold-formed metal framing members by welding. Wire tying of framing members is not permitted. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
4. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.

a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.

5. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.

B. Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.

C. Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:

1. Spacing: Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch (3 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting substrates and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.

B. After applying sprayed fire-resistive materials, remove only as much of these materials as needed to complete installation of cold-formed framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

3.3 INSTALLATION, GENERAL

A. Cold-formed metal framing may be shop or field fabricated for installation, or it may be field assembled.

B. Install cold-formed metal framing according to ASTM C 1007, unless more stringent requirements are indicated.

C. Install shop- or field-fabricated, cold-formed framing and securely anchor to supporting structure.

1. Bolt or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch (1.6 mm).

D. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer's written recommendations and requirements in this Section.

1. Cut framing members by sawing or shearing; do not torch cut.
2. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.

   a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
   b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.

E. Install framing members in one-piece lengths, unless splice connections are indicated for track or tension members.

F. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.

G. Do not bridge building expansion and control joints with cold-formed metal framing. Independently frame both sides of joints.

H. Install insulation in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.

I. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

J. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet (1:960) and as follows:

1. Space individual framing members no more than plus or minus 1/8 inch (3 mm) from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

3.4 NON-LOAD-BEARING CURTAIN-WALL INSTALLATION

A. Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure as indicated.

B. Fasten both flanges of studs to top and bottom track, unless otherwise indicated. Space studs as follows:

1. Stud Spacing: 12 inches (305 mm).

C. Set studs plumb, except as needed for diagonal bracing or required for nonplumb walls or warped surfaces and similar requirements.

D. Isolate non-load-bearing steel framing from building structure to prevent transfer of vertical loads while providing lateral support.

1. Install single deep-leg deflection tracks and anchor to building structure.

E. Install horizontal bridging in curtain-wall studs, spaced in rows indicated on Shop Drawings but not more than 54 inches (1370 mm) apart. Fasten at each stud intersection.

1. Bridging: Cold-rolled steel channel, welded or mechanically fastened to webs of punched studs.
2. Bridging: Combination of flat, taut, steel sheet straps of width and thickness indicated and stud-track solid blocking of width and thickness to match studs. Fasten flat straps to stud flanges and secure solid blocking to stud webs or flanges.

F. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable curtain-wall-framing system.

3.5 GYPSUM SHEATHING INSTALLATION

A. General: Install gypsum sheathing to comply with GA-253 and manufacturer's written instructions.

B. Cut boards at penetrations, edges, and other obstructions of the work; fit tightly against abutting construction, except provide a 3/8-inch (9-mm) setback where non-load-bearing construction abuts structural elements.

C. Coordinate sheathing installation with flashing and joint sealant installation so these materials are installed in the sequence and manner that prevent exterior moisture from passing through completed exterior wall assembly.

D. Apply fasteners so screw heads bear tightly against face of sheathing boards but do not cut into facing.

E. Do not bridge building expansion joints with sheathing; cut and space edges to match spacing of structural support elements.

F. Vertical Installation: Install 48-inch- (1219-mm-) wide gypsum sheathing boards vertically with vertical edges centered over flanges of steel studs. Abut ends and edges of each board with those of adjacent boards. Screw-attach boards at perimeter and within field of board to each steel stud at approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9 mm) from edges and ends of boards.

G. Sealing Sheathing Joints: Seal joints according to sheathing manufacturer's written recommendations and as follows:

1. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing board joints, and apply and trowel silicone emulsion sealant to embed sealant in entire face of tape. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

3.6 REPAIRS AND PROTECTION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

B. Protect cutouts, corners, and joints in sheathing by filling with a flexible sealant or by applying tape recommended by sheathing manufacturer at time sheathing is applied.

C. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure cold-formed metal framing is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05400

SECTION 05410 - PRE-FABRICATED LIGHT-GAUGE STEEL TRUSSES

PART 1 GENERAL

1.1_ SUMMARY

A. Section includes pre-engineered, prefabricated light gauge cold formed steel framing elements. Work includes:

1. Light Gauge cold formed steel roof trusses.
2. Anchorage, bracing and bridging.
3. Related work.

1.2 REFERENCES

A. Reference Standards: ADTM A653/A653M-94 “Sheet steel zinc-iron alloy-coated by the hot dip process” American Welding Society (AWS).

1. AWS D1.1 “Structural Welding Code - Steel.”
2. AWS D1.3”AStructural Welding Code - Sheet Steel.”

1.3 SYSTEM DESCRIPTION

A. AISI “Specifications”: Calculate structural characteristics of cold-formed steel truss members according to AISI’s “Specification for the Design of Cold-Formed Steel Structural Members, 1990.”

B. Structural Performance: Design, engineer, fabricate, and erect cold-formed steel trusses to withstand actual loads within limits and under conditions required.

1. Deflections: Live load deflection limited to L/500.
2. Total Load Deflection: limited to L/420.
3. Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum amblent temperature change (range) of 120 deg. F.
4. Design components for all live and dead and collateral loads and in addition for wind loads for 105mph wind in accordance with IBC - 2000.

1.4 SUBMITTALS

1. Submit manufacturer=s product data and installation instructions for each type of cold-formed steel framing and accessory required. Submit shop drawings showing member, type, location, spacing, size an gage of member method of attachment to support members and all necessary erection details, indicate supplemental bracing, strapping, splices, bridging, accessories, and details required for proper installation.

B. Submit truss drawings, sealed and signed by a qualified registered Louisiana Registered Professional Engineer, verifying truss ability to meet local code and design requirements for Baton Rouge, Louisiana.

C. Description of design criteria:

1. Engineering analysis depicting member stresses and truss deflection.
2. Truss members sizes and gauges and connections at truss joints.
2. Truss support reactions.
3. Top chord, bottom chord and wed bracing requirements.

1.5 ENGINEERING DRAWINGS

A. All truss designs shall bear the name and seal of a Licensed Professional Engineer registered as a Civil Engineer in the State of Louisiana.

B. Truss designs shall include the following information: Pitch, span, dimension, and spacing of truss. Truss bearing sizes and locations. Design loading of truss. Screw type and required quantity at each joint. Size and gauge of steel required in all truss members. Permanent lateral bracing as required by design to reduce buckling length of individual truss members and for stability of overall truss roof system. Handling and erection recommendations. A certified bracing plan shall be submitted for approval as part of the shop drawings. Bottom chords may or may not be braced by ceilings. See architectural drawings and provide bracing as required.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Fabrication shall be performed by a cold-formed steel truss fabricator with experience designing and fabricating cold-formed steel systems equal in material, design, and extent to the systems required for this project.

B. Cold formed steel truss system installation shall be performed by the steel truss system fabricator.

C. Welding Standards: Comply with applicable provisions of AWS D1.1 “Structural Welding Code-Steel” and AWS D1.3 “Structural welding Code-Sheet Steel.”

D. Qualify welding processes and welding operators in accordance with AWS “Standard Qualification Procedure.”

1.7 DELIVERY STORAGE AND HANDLING

A. Deliver materials in manufacturer=s unopened containers or bundles, fully identified by name brand, type and grade. Exercise care to avoid damage during unloading, storing and erection.

B. Store trusses on blocking, pallets, platforms or other supports off the ground and in an upright position sufficiently braced to avoid damage form excessive bending.

C. Protect trusses and accessories form corrosion, deformation, damage and deterioration when stored at job site. Keep trusses free of dirt and other foreign matter.

1.8 PROJECT/SITE CONDITIONS

A During construction, adequately distribute all loads applied to trusses so as not to exceed the carrying capacity of any one truss or other component.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. All trusses referred to in this specification shall be; Apline Truss Steel, Grand Prairie, TX, 1-800-755-6005; Steel Source, Inc., Tyler, Texas, 1-903-581-8107, Versa Truss System, Aegis Ultra-Span, or approved equal truss system.

2.2 MATERIALS

A Reference Section: The design and fabrication of all steel trusses shall meet with the specifications set by the American Iron and Steel Institute (AISI) as well as any applicable codes set forth by the local governing building authority, and the Southern Building Code Congress International (SBCCI).

B. Steel: All steel used for truss members shall be structural sections, meeting ASTM A446 Specifications. Steel is to have a minimum yield strength of 45 KSI, unless otherwise noted, and a minimum G60 galvanization.

C. Screws: All screws used in the manufacture of steel trusses shall be exterior rated zinc coated Self - Drilling screws. Minimum shear capacity (including a safety factor of 3) shall be as follows:

Screw Size	Steel Gauge	Shear Capacity
#10-16	22 ga	203 lbs
	20 ga	268 lbs.
	18 ga	403 lbs.
	16 ga	423 lbs.
#12-14	14 ga	713 lbs.
	12 ga	635 lbs.

D. When members of different gauges are joined, the smallest gauge should be used to determine the screw value at that point.

E. All component gauges: Fabricate components of structural quality steel sheet per ASTM A653 with a minimum yield strength for top cord sections of 55 KSI with web material of 45 KSI steel in 20 gauge minimum thickness.

F. Bracing, Bridging, and Blocking Members: Fabricate components of commercial quality steel sheet per ASTM A653 with a minimum yield strength of 33,000 psi.

G. Steel truss components: Provide sizes, shapes, and gauges indicated and as required by design.

H. Design Uncoated-Steel Thickness: 20 ga. (Minimum)

I. Finish: Provide components with protective zinc coating complying with ASTM A653, minimum G60.

J. Fastenings: manufacturer recommended self-drilling, self-tapping screws with exterior rated zinc plated finish. Fasteners shall be of sufficient size and number to ensure the strength of the connection.

K. Welding: Comply with AWS D1.1 when applicable and AWS D1.3 for welding base metals less than 1/8" thick.

L. Other fasteners as accepted by truss engineer.

2.3 FABRICATION

A. Factory fabricate cold-formed steel trusses plumb, square, true to line, and with connections securely fastened, according to manufacturer=s recommendations and the requirements of this Section.

B. Fabricate truss assemblies in jig templates.

C. Cut truss members by sawing or shearing or plasma cutting. Truss members shall be properly placed in special jigs, holding the members uniformly in place, until the joints have been completely connected with the required number of screw fasteners.

D. Fasten cold-formed steel truss members by welding or screw fastening, or other methods as standard with fabricator. Wire tying of framing members is not permitted.

E. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

F. Locate mechanical fasteners and install according to cold-formed steel truss component manufacturer=s instructions with screw penetrating joined members by not less than 3 exposed screw threads.

G. Care shall be taken during handling, delivery and erection. Brace, block, or reinforce truss as necessary to minimize member and connection stresses.

H. Fabricate units to maximize variance tolerance from level, true and plumb of 1/8" in ten feet.

I. Truss construction on job-site is strictly forbidden. They shall be manufactured by experienced workmen, using precision truss fabricating equipment, under the direct supervision of a qualified foreman. All trusses shall be fabricated under strict rules of inspection and quality control as the local codes may require.

PART 3 EXECUTION

3.1 HANDLING, ERECTION, AND BRACING

A. Engineering framing anchors and/or truss hangers shall be provided by the contractor in accordance with design requirements.

B. Field erection of the trusses, including items such as proper handling, safety precautions, temporary erection bracing to prevent toppling or dominoing of the trusses during erection, and any other safeguards or procedures consistent with good workmanship and good building erection practices, shall be the responsibility of the General Contractor and/or the Erection Contractor.

C. During the entire construction period, all contractors shall provide means for adequate distribution of concentrated loads so that carrying capacity of any one truss and/or other components is not exceeded.

D. Proper erection bracing shall be installed to hold the truss true and plumb and in safe condition until permanent truss bracing and bridging can be solidly fastened in place to form a structurally sound framing system. All erection and permanent bracing shall be installed and all components permanently fastened before the application of any loads.

E. The permanent structural cross-bracing to ensure the overall rigidity of the roof system, shall be the responsibility of the Truss Supplier and Contractor. Provide a certified bracing plan for approval as part of the shop drawing submittal.

3.2 INSTALLATION

A. Install metal framing systems in accordance with manufacturer=s printed or written instruction and recommendations.

B. Installation of truss: Secure to structures, weld symmetrically on both sides of truss, or provide symmetrical connection hardware as required.

C. Set trusses plumb where truss system abuts structural columns or walls, including masonry walls, anchor ends of stiffeners to supporting structure.

D. Install supplementary framing, blocking, and bracing in metal framing system wherever walls or partitions are indicated to support fixtures, equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to the wall or partition. Where type of supplementary support is not otherwise indicated, comply with manufacturer=s recommendations and industry standards in each case, considering weight or loading resulting from item supported.

E. It is the responsibility of the General Contractor and Sub-Contractor to insure that fabricated trusses shall be handled, stored, and installed in such a manner that they are not subjected to damage. If it is necessary to store trusses prior to installation, the trusses must be stored in a vertical position with adequate bearing points and bracing to prevent tripping or racking. Proper handling, safety precautions, and other procedures consistent with good installation practices must be observed by all sub-contractors and their employees. Installation bracing shall hold trusses straight and plumb and in safe condition until decking and permanent truss bracing has been fastened forming a structurally sound framing system. All sub-contractors shall employ proper construction procedures to insure adequate distribution of temporary construction loads so that the carrying capacity of any single truss, or group of trusses, is not exceeded. All temporary and permanent bracing shall be installed and all trusses permanently fastened before application of any loads. Permanent structural bracing shall be installed prior to subjecting the structure to additional loads.

F. Chord and web members SHALL NOT be removed, cut, punched, or altered without the prior approval of the truss design engineer. Damaged chords, webs, or complete trusses shall be repaired or replaced as directed and approved by a registered Professional Engineer. The repair or replacement detail(s) shall be approved by a registered Professional Engineer prior to installation or application of the repair or replacement.

G. Weld 12 gauge minimum connectors to attach trusses to structure. Provide structural brackets on both sides of each bearing point. Prime all field welds with zinc chromate liquid galvanizing coating.

8. Trusses shall be designed for all mechanical pipe loads and other suspended equipment loads as required.

END OF SECTION 05410

SECTION 05500 - METAL FABRICATIONS

PART 1 - GENERAL

RELATED DOCUMENTS

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

SUMMARY

This section includes the following metal fabrications:

Loose steel lintels.

DEFINITIONS

Definitions in ASTM E 985 for railing related terms apply to this section.

SYSTEM PERFORMANCE REQUIREMENTS

Structural Performance: Design, engineer, fabricate, and install the following metal fabrications to withstand the structural loads required per the Standard Building Code, 1991 Edition, without exceeding the allowable design working stress of the materials involved, including anchors and connections. Apply each load to produce the maximum stress in each respective component of each metal fabrication.

Top Rail of Guardrail Systems
Handrails Not Serving as Top Rails
Infill Area of Guardrail Systems
Treads and Platforms of Steel Stairs

SUBMITTALS

Product data for products used in miscellaneous metal fabrications, including paint products and grout.

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.

Where installed metal fabrications are indicated to comply with certain design loadings, include structural computations, material properties, and other information needed for structural analysis that has been signed and sealed by the qualified professional engineer who was responsible for their preparation.

QUALITY ASSURANCE

Fabricator Qualifications: Firm experienced in successfully producing metal fabrications similar to that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the Work.

Installer Qualifications: Arrange for installation of metal fabrications specified in this section by same firm that fabricated them.

Qualify welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel," D1.3 "Structural Welding Code - Sheet Steel", and D1.2 “Structural Welding Code Aluminum.”

Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

Engineer Qualifications: Professional engineer licensed to practice in jurisdiction where project is located and experienced in providing engineering services of the kind indicated that have resulted in the successful installation of metal fabrications similar in material, design, and extent to that indicated for this Project.

PROJECT CONDITIONS

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 delay of Work.

Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabrication of products without field measurements. Coordinate construction to ensure that actual opening dimensions correspond to guaranteed dimensions. Allow for trimming and fitting.

SEQUENCING AND SCHEDULING

Sequence and coordinate installation of wall handrails as follows:

Mount handrails only on completed walls. Do not support handrails temporarily by any means not satisfying structural performance requirements.

Mount handrails only on gypsum board assemblies reinforced to receive anchors, and where the location of concealed anchor plates has been clearly marked for benefit of Installer.

PART 2 - PRODUCTS

FERROUS METALS

Metal Surfaces, General: For metal fabrications exposed to view upon completion of the Work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and, for steel sheet, variations in flatness exceeding those permitted by reference standards for stretcher-leveled sheet.

Steel Plates, Shapes, and Bars: ASTM A 36.

Steel Tubing: Product type (manufacturing method) and as follows:

Cold-Formed Steel Tubing: ASTM A 500, Grade A, unless otherwise indicated or required for design loading.

Hot-Formed Steel Tubing: ASTM A 501. For exterior installations and where indicated, provide tubing with hot-dip galvanized coating per ASTM A 53.

Uncoated Structural Steel Sheet: Product type (manufacturing method), quality, and grade, as follows:

Hot-Rolled Structural Steel Sheet: ASTM A 570, Grade 30, unless otherwise indicated or required by design loading.

Uncoated Steel Sheet: Commercial quality, Hot-Rolled Steel Sheet, ASTM A 569

Galvanized Steel Sheet: Quality as follows:

Structural Quality: ASTM A 446; Grade A, unless another grade required for design loading, and G90 coating designation unless otherwise indicated.

Commercial Quality: ASTM A 526, G90 coating designation unless otherwise indicated.

Steel Pipe: ASTM A 53; finish, type, and weight class as follows:

Black finish, except provide galvanized finish for exterior installations and where indicated.

Standard weight (schedule 40), unless otherwise indicated, or another weight, type, and grade required by structural loads.

Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.

Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A 153.

Welding Rods and Bare Electrodes: Select in accordance with AWS specifications for the metal alloy to be welded.

GROUT AND ANCHORING CEMENT

Nonshrink Metallic Grout: Premixed, factory-packaged, ferrous aggregate grout complying with CE CRD-C 621, specifically recommended by manufacturer for heavy duty loading applications of type specified in this section.

Nonshrink Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with CE CRD- C 621. Provide grout specifically recommended by manufacturer for interior and exterior applications.

Products: Subject to compliance with requirements, provide one of the following:

Nonshrink Metallic Grouts:

"Metox RM"; Chem-Masters Corp.
"Hi Mod Grout"; Euclid Chemical Co.
"Embeco 885 and 636"; Master Builders.
"Ferrolith G Redi-Mix and G-NC"; Sonneborn Building Products Div., Rexnord Chemical Products, Inc.
"Stoncrete MG1"; Stonhard, Inc.

Nonshrink Nonmetallic Grouts:

"Euco N-S Grout"; Euclid Chemical Co.
"Kemset"; Chem-Masters Corp.
"Masterflow 713"; Master Builders.
"Sonogrout"; Sonneborn Building Products Div., Rexnord Chemical Products, Inc.
"Stoncrete NM1"; Stonhard, Inc.

FASTENERS

General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.

Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
Lag Bolts: Square head type, FS FF-B-561.
Machine Screws: Cadmium plated steel, FS FF-S-92.
Plain Washers: Round, carbon steel, FS FF-W-92.
Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class, and style as required.
Lock Washers: Helical spring type carbon steel, FS FF-W-84.

Drilled-In Expansion Anchors: Expansion anchors complying with FS FF-S-325, Group VIII (anchors, expansion, [nondrilling]), Type I (internally threaded tubular expansion anchor); and machine bolts complying with FS FF-B-575, Grade 5.

PAINT

Shop Primer for Ferrous Metal: Manufacturer's or fabricator's standard, fast-curing, lead-free, universal modified alkyd primer selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated, and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure complying with performance requirements of FS TT - P - 645.

Galvanizing Repair Paint: High zinc dust content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint-20.

Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12 except containing no asbestos fibers.

FABRICATION, GENERAL

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.

Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

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.

Temperature Change (Range): 100 deg F (55.5 deg C).

Shear and punch metals cleanly and accurately. Remove burrs.

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.

Remove sharp or rough areas on exposed traffic surfaces.

Weld corners and seams continuously to comply with AWS recommendations and the following:

Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

Obtain fusion without undercut or overlap.

Remove welding flux immediately.

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.

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.

Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.

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.

Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware, screws, and similar items.

Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

LOOSE STEEL LINTELS

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.

Weld adjoining members together to form a single unit where indicated.

Size loose lintels for equal bearing of one inch per foot of clear span but not less than 8 inches bearing at each side of openings, unless otherwise indicated.

Galvanize loose steel lintels located in exterior walls.

MISCELLANEOUS FRAMING AND SUPPORTS

General: Provide steel framing and supports for applications indicated or which are not a part of structural steel framework, as required to complete work.

Fabricate units to sizes, shapes, and profiles indicated and required to receive adjacent other 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.

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.

Except as otherwise indicated, space anchors 24 inches o.c. and provide minimum anchor units in the form of steel straps 1-1/4 inch wide x ¼ inch x 8 inches long.

Galvanize miscellaneous framing and supports at exterior locations.

MISCELLANEOUS STEEL TRIM

Provide shapes and sizes indicated for profiles shown. Unless otherwise indicated, fabricate units from structural steel shapes, plates, and steel bars, with continuously welded joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings, and anchorages as required for coordination of assembly and installation with other work.

Galvanize miscellaneous framing and supports at exterior locations.

SHELF AND RELIEVING ANGLES

Fabricate shelf and relieving angles from steel angles of sizes indicated and for attachment to concrete framing. Provide slotted holes to receive 3/4 inch bolts, spaced not more than 6 inches from ends and not

more than 24 inches o.c., unless otherwise indicated.

For cavity walls, provide vertical channel brackets to support shelf/relieving angles from back-up masonry and concrete. Align expansion joints in angles with indicated expansion joints in cavity wall exterior wythe.

Galvanize shelf angles to be installed on exterior concrete framing.

STEEL PIPE RAILINGS AND HANDRAILS

General: Fabricate pipe railings and handrails to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of pipe, post spacings, and anchorage, but not less than that required to support structural loads.

Interconnect railing and handrail members by butt-welding or welding with internal connectors, at fabricator's option, unless otherwise indicated.

At tee and cross intersections, notch ends of intersecting members to fit contour of pipe to which end is joined and weld all around.

Form changes in direction of railing members by any method indicated below, applicable to change of direction involved.

By insertion of prefabricated elbow fittings.
By radius bends of radius indicated.
By mitering at elbow bends.
By bending.
By any method indicated above, applicable to change of direction involved.

Form simple and compound curves by bending pipe in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross-section of pipe throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of pipe.

Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated.

Close exposed ends of pipe by welding 3/16 inch thick steel plate in place or by use of prefabricated fittings, except where clearance of end of pipe and adjoining wall surface is 1/4 inch or less.

Toe Boards: Where indicated, provide toe boards at railings around openings and at the edge of open-sided floors and platforms. Fabricate to dimensions and details indicated, or if not indicated, use 4 inches high x 1/8 inch steel plate welded to, and centered between, each railing post.

Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnections of pipe and attachment of railings and handrails to other work. Furnish inserts and other anchorage devices for connecting railings and handrails to concrete or masonry work.

For railing posts set in concrete fabricate sleeves from steel pipe not less than 6 inches long and with an inside diameter not less than 1/2 inch greater than the outside diameter of post, with steel plate closure welded to bottom of sleeve.

Provide friction fit, removable covers designed to keep sleeves clean and hold top edge of sleeve 1/2 inch below finished surface of concrete.

For removable railing posts, fabricate slip-fit sockets from steel pipe whose inside diameter is sized for a close fit with posts and to limit deflection of post without lateral load, measured at top, to not more than 1/12 of post height. Provide socket covers designed and fabricated to resist accidental dislodgement.

Fillers: Provide steel sheet or plate fillers of thickness and size indicated or required to support structural loads of handrails where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses. Size fillers to produce adequate bearing to prevent bracket rotation and overstressing of substrate.

For exterior steel railings and handrails formed from steel pipe with galvanized finish, galvanize fittings, brackets, fasteners, sleeves, and other ferrous components.

For interior steel railings formed from steel pipe with black finish, provide nongalvanized ferrous metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.

STEEL FRAMED STAIRS

General: Construct stairs to conform to sizes and arrangements indicated. Join pieces together by welding, unless otherwise indicated. Provide complete stair assemblies, including metal framing, hangers, columns, railings, newels, balusters, struts, clips, brackets, bearing plates, and other components necessary for the support of stairs and platforms, and as required to anchor and contain the stairs on the supporting structure.

NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM "Metal Stair Manual" for Architectural class of stair.

Fabricate treads and platforms of exterior stairs to accommodate slopes to drain in finished traffic surfaces.

Stair Framing: Fabricate stringers of structural steel channels, or plates, or a combination thereof, as indicated. Provide closures for exposed ends of stringers. Construct platforms of structural steel channel headers and miscellaneous framing members as indicated. Bolt or weld headers to strings, newels, and framing members to strings and headers; fabricate and join so that bolts, if used, do not appear on finish surfaces.

Where masonry walls support steel stairs, provide temporary supporting struts designed for erection of steel stair components before installation of masonry.

Metal Pan Risers, Subtreads, and Subplatforms: Shape metal pans for risers and subtreads to conform to configuration shown. Provide thicknesses of structural steel sheet for metal pans indicated, but not less than that required, to support total design loading.

Form metal pans of uncoated cold-rolled steel sheet, unless otherwise indicated.

Directly weld risers and subtreads to stringers; locate welds on side of metal pans to be concealed by concrete fill.

Provide subplatforms of configuration and construction indicated; if not indicated, of same metal as risers and subtreads, in thicknesses required to support design loading. Attach subplatform to platform framing members with welds.

Smooth Soffit Construction: Construct subplatforms with smooth soffits.

Attach cast abrasive nosings to pan risers. Make nosings full width of tread with noses flush with riser faces and tread surfaces.

Stair Railings and Handrails: Comply with applicable requirements specified elsewhere in this section for steel pipe railings and handrails, and as follows:

Fabricate newels of steel tubing and provide newel caps of gray iron casting, as shown.

Railings may be bent at corners, rail returns, and wall returns, instead of using prefabricated fittings.

Connect railing posts to stair framing by direct welding, unless otherwise indicated.

FINISHES, GENERAL

Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes.

Finish metal fabrications after assembly.

STEEL AND IRON FINISHES

Galvanizing: For those items indicated for galvanizing, apply zinc-coating by the hot-dip process compliance with the following requirements:

ASTM A 153 for galvanizing iron and steel hardware.

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 and heavier.

Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

Exteriors (SSPC Zone 1B): SSPC-SP6 "Commercial Blast Cleaning."
Interiors (SSPC Zone 1A): SSPC-SP3 "Power Tool Cleaning:

Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finish or to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with requirements of SSPC-PA1 "Paint Application Specification No. 1" for shop painting.

Stripe paint all edges, corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

PREPARATION

Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of 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.

Center nosings on tread widths with noses flush with riser faces and tread surfaces.

Set sleeves in concrete with tops flush with finish surface elevations; protect sleeves from water and concrete entry.

INSTALLATION, GENERAL

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.

Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installation of 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.

Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.

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 which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, methods used in correcting welding work, and the following:

Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

Obtain fusion without undercut or overlap.

Remove welding flux immediately.

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.

SETTING LOOSE PLATES

Clean concrete and masonry bearing surfaces of any bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.

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 grout.

Use metallic nonshrink grout in concealed locations where not exposed to moisture; use nonmetallic nonshrink grout in exposed locations, unless otherwise indicated.

Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

INSTALLATION OF STEEL PIPE RAILINGS AND HANDRAILS

Adjust railings prior to anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated, or if not indicated, as required by design loadings. Plumb posts in each direction. Secure posts and railing ends to building construction as follows:

Anchor posts in concrete by means of pipe sleeves preset and anchored into concrete. After posts have been inserted into sleeves, fill annular space between post and sleeve solid with nonshrink, nonmetallic grout anchoring material, mixed and placed to comply with anchoring material manufacturer's directions.

Cover anchorage joint with a round steel flange attached to post either by welding to post after placement of anchoring material or by set screws.

Leave anchorage joint exposed, wipe off surplus anchoring material, and leave 1/8 inch build-up, sloped away from post. For installations exposed on exterior, or to flow of water, seal anchoring material to comply with grout manufacturer's directions.

Anchor posts to steel with steel oval flanges, angle type or floor type as required by conditions, welded to posts and bolted to steel supporting members.

Anchor rail ends into concrete and masonry with steel round flanges welded to rail ends and anchored into wall construction with lead expansion shields and bolts.

Anchor rail ends to steel with steel oval or round flanges welded to rail ends and bolted to structural steel members, unless otherwise indicated.

Install removable railing sections where indicated in slip-fit metal sockets cast into concrete. Accurately locate sockets to match post spacing.

Secure handrails to wall with wall brackets and end fittings. Provide bracket with not less than 1-1/2 inch clearance from inside face of handrail and finished wall surface. Locate brackets as indicated, or if not indicated, at spacing required to support structural loads. Secure wall brackets and wall return fittings to building construction as follows:

Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.

For concrete and solid masonry anchorage, use drilled-in expansion shield and either concealed hanger bolt or exposed lag bolt, as applicable.

For hollow masonry anchorage, use toggle bolts having square heads.

For steel framed gypsum board assemblies, fasten brackets directly to steel framing or concealed anchors using self- tapping screws of size and type required to support structural loads.

Expansion Joints: Provide expansion joints at locations indicated, or if not indicated, at intervals not to exceed 40 feet. Provide slip joint with internal sleeve extending 2 inches beyond joint on either side; fasten internal sleeve securely to one side; locate joint within 6 inches of posts.

ADJUSTING AND CLEANING

Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA 1 requirements for touch-up of field painted surfaces. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.

For galvanized surfaces clean welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

END OF SECTION 05500

SECTION 05511 - METAL STAIRS

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. Preassembled steel stairs with concrete-filled treads.
2. Railings attached to metal stairs.
3. Handrails attached to walls adjacent to metal stairs.

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance of Stairs: Provide metal stairs capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Uniform Load: 100 lbf/sq. ft. (4.79 kN/sq. m).
2. Concentrated Load: 300 lbf (1.33 kN) applied on an area of 4 sq. in. (2580 sq. mm).
3. Uniform and concentrated loads need not be assumed to act concurrently.
4. Stair Framing: Capable of withstanding stresses resulting from railing loads in addition to loads specified above.
5. Limit deflection of treads, platforms, and framing members to **L/360** or 1/4 inch (6.4 mm), whichever is less.

B. Structural Performance of Railings: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails:

   a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
   b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
   c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Top Rails of Guards:

   a. Uniform load of 50 lbf/ ft. (0.73 kN/m) applied in any direction.
   b. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
   c. Uniform and concentrated loads need not be assumed to act concurrently.

3. Infill of Guards:

   a. Concentrated load of **50 lbf (0.22 kN)** applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
   b. Infill load and other loads need not be assumed to act concurrently.

1.4 SUBMITTALS

A. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Provide templates for anchors and bolts specified for installation under other Sections.
2. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. NAAMM Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP 510, "Metal Stairs Manual," for class of stair designated, unless more stringent requirements are indicated.

1. Preassembled Stairs: Commercial class.

C. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code--Steel."
2. AWS D1.3, "Structural Welding Code--Sheet Steel."

1.6 COORDINATION

A. Coordinate installation of anchorages for metal stairs. 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. Coordinate locations of hanger rods and struts with other work so that they will not encroach on required stair width and will be within the fire-resistance-rated stair enclosure.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 METALS, GENERAL

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.3 FERROUS METALS

A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

B. Steel Tubing: **ASTM A 513, Type 5 (mandrel drawn)**.

C. Rolled-Steel Floor Plate: ASTM A 786/A 786M, rolled from plate complying with ASTM A 36/A 36M or ASTM A 283/A 283M, Grade C or D.

D. Uncoated, Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M,[**either commercial steel, Type B, or**] structural steel, Grade 30 (Grade 205), unless another grade is required by design loads.

2.4 FASTENERS

A. General: Provide zinc-plated fasteners with coating complying with ASTM B 633, Class Fe/Zn 25 for exterior use, and Class Fe/Zn 5 where built into exterior walls. Select fasteners for type, grade, and class required.

B. Bolts and Nuts: Regular hexagon-head bolts, ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with hex nuts, ASTM A 563 (ASTM A 563M); and, where indicated, flat washers.

C. Anchor Bolts: ASTM F 1554, Grade 36.

1. Provide hot-dip or mechanically deposited, zinc-coated anchor bolts for [**exterior stairs**] [**stairs indicated to be galvanized**] [**stairs indicated to be shop primed with zinc-rich primer**].

D. Machine Screws: ASME B18.6.3 (ASME B18.6.7M).

E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).

F. Plain Washers: Round, ASME B18.22.1 (ASME B18.22M).

G. Lock Washers: Helical, spring type, ASME B18.21.1 (ASME B18.21.2M).

H. Expansion Anchors: Anchor bolt and sleeve assembly with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

1. Material for Anchors in Interior Locations: Carbon-steel components zinc-plated to comply with ASTM B 633, Class Fe/Zn 5.
2. Material for Anchors in Exterior Locations: Alloy Group 1 (A1) stainless-steel bolts complying with ASTM F 593 (ASTM F 738M) and nuts complying with ASTM F 594 (ASTM F 836M).

2.5 MISCELLANEOUS MATERIALS

A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

B. Shop Primers: Provide primers that comply with Division 9 painting Sections.

C. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

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. Concrete Materials and Properties: Comply with requirements in Division 3 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa), unless otherwise indicated.

F. Welded Wire Fabric: ASTM A 185, 6 by 6 inches (152 by 152 mm)--W1.4 by W1.4, unless otherwise indicated.

2.6 FABRICATION, GENERAL

A. Provide complete stair assemblies, including metal framing, hangers, struts, railings, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.

1. Join components by welding, unless otherwise indicated.
2. Use connections that maintain structural value of joined pieces.
3. Fabricate treads and platforms of exterior stairs so finished walking surfaces slope to drain.

B. Preassembled Stairs: Assemble stairs in shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

E. Form exposed work true to line and level with accurate angles and surfaces and straight edges.

F. Weld connections 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. Weld exposed corners and seams continuously, unless otherwise indicated.
5. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated. Locate joints where least conspicuous.

H. Fabricate joints that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

2.7 STEEL-FRAMED STAIRS

A. Stair Framing:

1. Fabricate stringers of steel channels.

   a. Provide closures for exposed ends of channel stringers.

2. Construct platforms of steel channel headers and miscellaneous framing members as needed to comply with performance requirements indicated.
3. Weld stringers to headers; weld framing members to stringers and headers.
4. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.

B. Metal-Pan Stairs: Form risers, subtread pans, and subplatforms to configurations shown from steel sheet of thickness needed to comply with performance requirements but not less than 0.0677 inch (1.7 mm).

1. Steel Sheet: Uncoated hot-rolled steel sheet, unless otherwise indicated.
2. Directly weld metal pans to stringers; locate welds on top of subtreads where they will be concealed by concrete fill. Do not weld risers to stringers.
3. Attach risers and subtreads to stringers with brackets made of steel angles or bars. Weld brackets to stringers and attach metal pans to brackets by welding, riveting, or bolting.
4. Shape metal pans to include nosing integral with riser.

2.8 STEEL TUBE RAILINGS

A. General: Fabricate railings to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of tube, post spacings, and anchorage, but not less than that needed to withstand indicated loads.

1. Configuration: **1-5/8-inch- (41-mm-) diameter** top and bottom rails, 1-1/2-inch- (38-mm-) square posts, and 1/2-inch- (13-mm-) square pickets spaced less than 4 inches (100 mm) clear.

B. Welded Connections: Fabricate railings with 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.

C. Form changes in direction of railings as follows:

1. As detailed.

D. 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.

E. Close exposed ends of railing members with prefabricated end fittings.

F. 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 (6 mm) or less.

G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.

1. Connect posts to stair framing by direct welding, unless otherwise indicated.
2. For nongalvanized railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.

H. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

2.9 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish metal stairs after assembly.

C. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed products:
1. Interior Stairs (SSPC Zone 1A): SSPC-SP 3, "Power Tool Cleaning."

D. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.

C. Install metal stairs by welding stair framing to steel structure or to weld plates embeded into cmu, unless otherwise indicated.

D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

E. 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 surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

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 no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

G. Place and finish concrete fill for treads and platforms to comply with Division 3 Section "Cast-in-Place Concrete."

3.2 INSTALLING METAL STAIRS WITH GROUTED BASEPLATES

A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of baseplates.

B. Set steel stair baseplates on wedges, shims, or leveling nuts. After stairs have been positioned and aligned, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with grout.

1. Use nonmetallic, nonshrink grout, unless otherwise indicated.
2. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.3 INSTALLING STEEL TUBE RAILINGS

A. Adjust railing systems before anchoring to ensure matching alignment at abutting joints. Space posts at spacing indicated or, if not indicated, as required by design loads. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:

1. Anchor posts to steel by welding directly to steel supporting members.
2. Anchor handrail ends to concrete and masonry with steel round flanges welded to rail ends and anchored with postinstalled anchors and bolts.

B. Attach handrails to wall with wall brackets. Provide bracket with 1-1/2-inch (38-mm) clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads. Secure wall brackets to building construction as follows:

1. Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
2. Use type of bracket with predrilled hole for exposed bolt anchorage.
3. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
4. For hollow masonry anchorage, use toggle bolts.

3.4 ADJUSTING AND CLEANING

A. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9 painting Sections.

END OF SECTION 05511

SECTION 06100 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Wood blocking and nailers.
2. Sheathing.

1.3 DEFINITIONS

A. Rough Carpentry: Carpentry work not specified in other Sections and not exposed, unless otherwise indicated.

B. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. SPIB - Southern Pine Inspection Bureau.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber, plywood, and other panels; place spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.
4. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.
5. Provide dry lumber with 15 percent maximum moisture content at time of dressing for 2-inch nominal (38-mm actual) thickness or less, unless otherwise indicated.

B. Wood Structural Panels:

1. Plywood: Either DOC PS 1 or DOC PS 2, unless otherwise indicated.
2. Thickness: As needed to comply with requirements specified but not less than thickness indicated.
3. Comply with "Code Plus" provisions in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial."
4. Factory mark panels according to indicated standard.

2.2 MISCELLANEOUS LUMBER

A. General: Provide lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.

B. For items of dimension lumber size, provide Construction, Stud, or No. 2 grade lumber with [**19**] percent maximum moisture content and the following species:

1. Mixed southern pine; SPIB.

C. For concealed boards, provide lumber with 19 percent maximum moisture content and the following species and grades:

1. Mixed southern pine, No. 2 grade; SPIB.

2.3 SHEATHING

A. Plywood Roof Sheathing: Exposure 1 sheathing.

1. Span Rating: Not less than 32/16.
2. Thickness: Not less than 3/4" nominal.

2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: CABO NER-272.

D. Wood Screws: ASME B18.6.1.

E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

F. Lag Bolts: ASME B18.2.1. (ASME B18.2.3.8M).

G. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

2.5 MISCELLANEOUS MATERIALS

A. Building Paper: Asphalt-saturated organic felt complying with ASTM D 226, Type I (No. 15 asphalt felt), unperforated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Do not use materials with defects that impair quality of rough carpentry or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

C. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. CABO NER-272 for power-driven fasteners.
2. Table 2306.1, "Fastening Schedule," in the Standard Building Code.

D. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.

E. Use finishing nails for exposed work, unless otherwise indicated. Countersink nail heads and fill holes with wood filler.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated. Build anchor bolts into masonry during installation of masonry work. Where possible, secure anchor bolts to formwork before concrete placement.

3.3 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial," for types of structural-use panels and applications indicated.

1. Comply with "Code Plus" provisions in above-referenced guide.

B. Fastening Methods: Fasten panels as indicated below:

1. Sheathing:

a. Screw to cold-formed metal framing and metal decking. Fastner spacing to be 6 inches on center at perimeter and 8” on center in the field.
b. Space panels 1/8 inch (3 mm) apart at edges and ends.

3.4 BUILDING PAPER APPLICATION

A. Apply building paper horizontally with 2-inch (50-mm) overlap and 6-inch (150-mm) end lap; fasten to sheathing with galvanized staples or roofing nails. Cover upstanding flashing with 4-inch (102-mm) overlap.

3.5 BUILDING WRAP APPLICATION

A. Cover wall sheathing with building wrap as indicated.

1. Comply with manufacturers written instructions.
2. Cover upstanding flashing with 4-inch (102-mm) overlap.
3. Seal seams, edges, and penetrations with tape.
4. Extend into jambs of openings and seal corners with tape.

END OF SECTION 06100

SECTION 06402 - INTERIOR ARCHITECTURAL WOODWORK

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. Interior standing and running trim.

1.3 DEFINITIONS

A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items, unless concealed within other construction before woodwork installation.

B. Rough carriages for stairs are a part of interior architectural woodwork. Platform framing, headers, partition framing, and other rough framing associated with stairwork are specified in Division 6 Section "Rough Carpentry."

1.4 SUBMITTALS

A. Product Data: For each type of product indicated, including cabinet hardware and accessories, handrail brackets, and finishing materials and processes.

1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.

B. Samples for Verification: For the following:

1. Lumber with or for transparent finish, 5 inches (125 mm) wide by 24 inches (600 mm) long, for each species and cut, finished on 1 side and 1 edge.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and will maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 43 and 70 percent during the remainder of the construction period.

1.7 COORDINATION

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide materials that comply with requirements of the AWI quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.

B. Wood Species and Cut for Transparent Finish: Oak, Quarter Cut or Rift Cut.

2.2 FABRICATION, GENERAL

A. Interior Woodwork Grade: Provide Custom grade interior woodwork complying with the referenced quality standard.

B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.

2.3 INTERIOR STANDING AND RUNNING TRIM FOR TRANSPARENT FINISH

A. Quality Standard: Comply with AWI Section 300.

B. For rails wider or thicker than available lumber, use veneered construction. Do not glue for width or thickness.

C. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.

D. Wood Species and Cut: Match species and cut indicated for other types of transparent-finished architectural woodwork located in same area of building, unless otherwise indicated.

1. Provide split species on trim that face areas with different wood species, matching each face of woodwork to species and cut of finish wood surfaces in areas finished.

PART 3 - EXECUTION

3.1 PREPARATION

A. Condition woodwork to average prevailing humidity conditions in installation areas before installation.

B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

A. Quality Standard: Install woodwork to comply with AWI Section 1700 for the same grade specified in Part 2 of this Section for type of woodwork involved.

B. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).

C. Scribe and cut woodwork to fit adjoining work, and refinish cut surfaces and repair damaged finish at cuts.

D. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.

E. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than **96 inches (2400 mm)** long, except where shorter single-length pieces are necessary.

1. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base, if finished.
2. Install wall railings on indicated metal brackets securely fastened to wall framing.
3. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches (3 mm in 2400 mm).

F. Complete the finishing work specified in this Section to extent not completed at shop or before installation of woodwork. Fill nail holes with matching filler where exposed. Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats were applied in shop.

G. Refer to Division 9 Sections for final finishing of installed architectural woodwork.

3.3 ADJUSTING AND CLEANING

A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

B. Clean, lubricate, and adjust hardware.

C. Clean woodwork on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 06402

SECTION 07120 - COLD FLUID-APPLIED WATERPROOFING

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. Single-component, modified polyurethane waterproofing applied to concrete masonry unit walls with brick veneer and as indicated on drawings.

1.3 PERFORMANCE REQUIREMENTS

A. Provide waterproofing membrane that prevents the passage of water.

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 waterproofing.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who is acceptable to waterproofing manufacturer to install manufacturer's products.

B. Source Limitations: Obtain waterproofing materials through one source from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver liquid materials to Project site in original containers with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, shelf life, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by waterproofing manufacturer.

C. Remove and replace liquid materials that cannot be applied within their stated shelf life.

D. Protect stored materials from direct sunlight.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate, when relative humidity exceeds 85 percent, or when temperatures are less than 5 deg F (3 deg C) above dew point.

1. Do not apply waterproofing in snow, rain, fog or mist, or when such weather conditions are imminent during application and curing period.

B. Maintain adequate ventilation during application and curing of waterproofing materials.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the following products:

1. Single-Component, Modified Polyurethane Waterproofing:

a. Karnak Corporation; One-Kote System.
b. Pecora Corporation; Duramem 500.
c. Sonneborne, Div. of ChemRex Inc.; HLM 5000.
d. Tremco; Tremproof 60.

2.2 WATERPROOFING MATERIALS

A. General: Provide waterproofing materials recommended by manufacturer to be compatible with one another and able to develop bond to substrate under conditions of service and application, as demonstrated by waterproofing manufacturer based on testing and field experience.

1. Produce waterproofing materials suitable for application to vertical, horizontal, and sloped substrates, as applicable.
2. Provide waterproofing materials with not less than 90 percent solids.

B. Cold Fluid-Applied Waterproofing: Comply with ASTM C 836, with manufacturer's written physical requirements, and as follows:

1. Single-component, modified polyurethane waterproofing.

2.3 AUXILIARY MATERIALS

A. Primer: Manufacturer's standard, factory-formulated polyurethane or epoxy primer.

B. Reinforcing Strip: Manufacturer's recommended fiberglass mesh or polyester fabric.

C. Joint Sealant: Multicomponent polyurethane sealant, compatible with waterproofing, complying with ASTM C 920 Type M, Class 25; Grade NS for sloping and vertical applications or Grade P for deck applications; Use NT exposure; and as recommended by manufacturer for substrate and joint conditions.

1. Backer Rod: Closed-cell polyethylene foam.

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 concrete has cured and aged for minimum time period recommended by waterproofing manufacturer.
2. Verify that substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Clean and prepare substrate according to manufacturer's written recommendations. Provide clean, dust-free, and dry substrate for waterproofing application.

B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage or 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.

1. Abrasive blast clean concrete surfaces uniformly to expose top surface of fine aggregate according to ASTM D 4259 with a self-contained, recirculating, blast-cleaning apparatus. Remove material to provide a sound surface free of laitance, glaze, efflorescence, curing compounds, concrete hardeners, or form-release agents. Remove remaining loose material and clean surfaces according to ASTM D 4258.

D. Remove fins, ridges, and other projections and fill honeycomb, aggregate pockets, and other voids.

3.3 PREPARATION AT TERMINATIONS AND PENETRATIONS

A. Prepare vertical and horizontal surfaces at terminations and penetrations through waterproofing and at expansion joints, drains, and sleeves according to ASTM C 898 and manufacturer's written instructions.

B. Prime substrate, unless otherwise instructed by waterproofing manufacturer.

C. Apply a double thickness of waterproofing and embed a joint reinforcing strip in preparation coat when recommended by waterproofing manufacturer.

3.4 JOINT AND CRACK TREATMENT

A. Prepare, treat, rout, and fill joints and cracks in substrate according to ASTM C 898 and waterproofing manufacturer's written instructions. Remove dust and dirt from joints and cracks complying with ASTM D 4258 before coating surfaces.

1. Comply with ASTM C 1193 for joint-sealant installation.
2. Apply bond breaker between sealant and preparation strip.
3. Prime substrate and apply a single thickness of preparation strip extending a minimum of 3 inches (75 mm) along each side of joint. Apply a double thickness of waterproofing and embed a joint reinforcing strip in preparation coat.

3.5 WATERPROOFING APPLICATION

A. Apply waterproofing according to ASTM C 898 and manufacturer's written instructions.

B. Start installing waterproofing in presence of manufacturer's technical representative.

C. Apply primer over prepared substrate.

D. Mix materials and apply waterproofing by spray, roller, notched squeegee, trowel, or other application method suitable to slope of substrate.

1. Apply one or more coats of waterproofing to obtain a seamless membrane free of entrapped gases, with an average dry film thickness of 60 mils (1.5 mm) and a minimum dry film thickness of 50 mils (1.3 mm) at any point.
2. Apply waterproofing to prepared wall terminations and vertical surfaces.
3. Verify wet film thickness of waterproofing every 100 sq. ft. (9.3 sq. m).

3.6 CURING, PROTECTING, AND CLEANING

A. Cure waterproofing according to manufacturer's written recommendations, taking care to prevent contamination and damage during application stages and curing.

B. Protect waterproofing from damage and wear during remainder of construction period.

C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07120

SECTION 07139 -BENTONITE WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

The general provision of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this section.

1.2 DESCRIPTION OF WORK

The extent of Geotextile/Bentonite Clay waterproofing membrane is shown on the drawing and/or as specified herein.

1.3 RELATED WORK

A. Concrete
B. Masonry
C. Backfill
D. Expansion Joints

1.4 QUALITY ASSURANCE

A. Manufacturer: Provide Geotextile/Bentonite Clay waterproofing membrane produced by a manufacturer with a minimum of 5 years experience in the waterproofing industry.
B. Installer: A firm with a minimum of 2 years experience in installing bentonite clay or other related waterproofing products.

1.5 SUBMITTALS

A. Manufacturer: Submit six copies of product data sheets, specifications, installation instructions and general recommendations for each type of product specified.
B. Installer: Submit detail drawings for installation of product specified.
C. Warranty: Submit specimen of manufacturers' standard warranty.

1.6 WARRANTY

A. Upon completion and acceptance of the work required by this section, the manufacturer will issue a warranty agreeing to promptly replace defective materials for a period of 5 years.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original manufacturer's packaging and store materials in strict accordance with manufacturer's instructions.
B. Remove and replace products that have been prematurely exposed to moisture.

1.8 PROJECT CONDITIONS

A. Install materials in accordance with all safety and weather conditions required by the manufacturer.
B. Install materials only after work on the applicable substrate is complete.

PART 2 - PRODUCTS

2.1 WATERPROOFING SYSTEM

A. The Geotextile/Bentonite clay waterproofing membrane shall be CCW MiraCLAY supplied by Carlisle Coatings & Waterproofing Incorporated, 900 Hensley Lane, Wylie,

Texas 75098, Phone (800) 527-7092 Fax: (972) 442-0076 OR EQUAL PRODUCT BY VOLCLAY.

B. Physical Properties for Geotextile/Bentonite Clay Waterproofing Membrane:

CCW MiraCLAY Physical Properties:

Property	Test Method	Value
Bentonite Content	—	1.0 lb./ft^2 (.488 kg/m^2)*
Nominal Dry Thickness	—	0.25 in. (6.4 mm)
Weight	—	75 lb./ft^2 (34.05 kg/m^2)
Permeability	ASTM D 5084	5 x 10^{-9} cm/sec
Grab Tensile Strength	ASTM D 4632	95 lb. (422 N)
Grab Elongation	ASTM D 4632	150%
Puncture Resistance	ASTM D 4833	120 psi (828 kPa)
Hydrated Internal Shear	ASTM D 5321	500 psf (24 kPa)
Swell Index	ASTM D 5890	2g (24 ml) min.
Fluid Loss	ASTM D 5891	18 ml max

*@ 12% moisture content

C. Waterproofing system accessories supplied by waterproofing membrane manufacturer:
Mastic: CCW MiraCLAY Mastic is used for detailing at terminations and penetrations. Also used to fill minor voids in concrete and as a fillet in angle changes.
Granules: CCW MiraCLAY Granules used for horizontal to vertical transitions and for detailing at seams and slab penetrations.
Waterstop: CCW MiraSTOP used as a waterstop at cold concrete pours and between pre-cast concrete panels.

D. Membrane to Substrate Fasteners: Fasteners, of the type and length suitable for the substrate, shall be used in conjunction with washers, of at least 1” diameter, to attach the geotextile/bentonite clay waterproofing membrane to the substrate.

E. Membrane to Membrane Fasteners: Mechanically fasten membrane sheets together with a box-stapler or similar device for horizontal applications.

F. The Geotextile/Bentonite membrane shall consist of geotextile panels of sodium bentonite clay sandwiched between two layers of needle-punched woven and non-woven polypropylene fabrics.

G. Drainage Composite: Shall be CCW MiraDRAIN® as recommended by the manufacturer for each condition.

H. Perimeter Drainage System: Where required shall be CCW QuickDRAIN™.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine substrate and condition under which waterproofing will be installed. Do not proceed with the work until unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

A. Lagging, Concrete Cassions, Shotcrete or Gunite Applications:
1. Fill all spaces that are over 1" (25mm) in width with grout or concrete to a smooth and uniform surface. Cover large gaps with 1/2" (12mm) plywood or CCW MiraDRAIN 6000 or 6000XL.
2. Trowel CCW MiraCLAY Mastic around all tieback plates and soldier beams a minimum of 1 1/2" (39mm) thick and extend a minimum of 4" (10cm) beyond the flange.
3. Remove projections from the wall surface in excess of 3/4" (20mm).

B. Grade Substrates: Shall be level and uniform that is compacted to a minimum of 85% modified proctor.

C. Concrete Application:
   1. Apply CCW MiraCLAY Mastic to all construction joints at a minimum of 1/4" (7mm) thickness and a 3" (8cm) minimum width.
   2. Remove projections from the wall surface in excess of 3/4" (20mm).

3.3 INSTALLATION

A. Prevent geotextile/bentonite clay waterproofing membrane from hydrating before being covered with overburden. When threat of rain is imminent or backfill is not immediate, geotextile/bentonite clay waterproofing membrane should be covered with polyethylene sheeting.

B. Lagging Application
   1. Install a stripping piece of CCW MiraCLAY over each soldier beam that extends a minimum of 8" (20cm) beyond either side of the beam. Each soldier beam shall have a double layer of CCW MiraCLAY Membrane.
   2. Install CCW MiraCLAY with the stenciled side out.
   3. Starting at the bottom of the wall, unroll CCW MiraCLAY and nail across top of panel one nail per 12” (31cm) on center. Allow sheet to hang down nailing only as required to stabilize.
   4. Install adjacent membrane by overlapping edges a minimum of 4” (10cm).
   5. Fasten membrane once every 18” (45cm) on seams or as required to prevent blousing.
   6. Extend waterproofing membrane to or above grade and fasten membrane once every 12" to 15" (31cm to 39cm).
   7. Install CCW MiraSTOP at all pour joints and exterior perimeter of tie-back box outs.

C. Underslab Application: (Concrete slab shall have a minimum thickness of 4" if reinforced or 5” if not reinforced).
   1. Install CCW MiraCLAY with the stenciled side up.
   2. Overlap edges a minimum of 4” (10cm).
   3. Protect CCW MiraCLAY from damage caused by chairs with sharp edges or points by placing a patch of CCW MiraCLAY under the chair.
   4. Staple joints often enough to prevent excessive movement.
   5. Pour CCW MiraCLAY Granules or trowel CCW MiraCLAY Mastic around all penetrations and press in “cut to fit” collars of CCW MiraCLAY.
   6. Extend the installation of CCW MiraCLAY 12" (31cm) up or beyond the perimeter slab forms.
   7. Inspect and repair any damaged material before concrete pour.

D. Concrete Wall Application:
   1. Install CCW MiraCLAY with the stenciled side out.
   2. Starting at the bottom of the wall, unroll CCW MiraCLAY and nail across top of panel one nail per 12" (31cm) on center. Allow sheet to hang down nailing only as required to stabilize.
   3. Install adjacent membrane by overlapping edges a minimum of 4” (10cm).
   4. Fasten membrane once every 18” (45cm) on seams or as required to prevent blousing with 3/4” (20mm) to 1” (25mm) concrete nails with washers.
   5. Extend waterproofing membrane to or above grade and fasten membrane once every 12” (31cm) or use termination bar. Trowel a 1/2” (12mm) thick and 2’ (5cm) wide bead of CCW MiraCLAY Mastic at top edge of membrane.
   6. Create a cant at any vertical to horizontal transition by applying a 1.5” to 2” (4cm to 5cm) cant of CCW MiraCLAY Granules or CCW MiraCLAY Mastic.
   7. Strip in all corners and transitions with a 12" to 15" (31cm to 39cm) piece of CCW MiraCLAY membrane to double cover these areas.

E. Concrete Caissons, Shotcrete or Gunite Application
   1. Conform CCW MiraCLAY to the change in planes.
   2. Install CCW MiraCLAY with the stenciled side up.

3. Starting at the bottom of the wall, unroll CCW MiraCLAY and nail across top of panel one nail per 12” (31cm) on center. Allow sheet to hang down nailing only as required to stabilize.
4. Install adjacent membrane by overlapping edges a minimum of 4” (10cm).
5. Fasten membrane once every 2' to 3' (60cm to 90cm) on seams or as required to prevent blousing with 3/4” (19mm) to 1” (25mm) concrete nails with washers.

3.4 PROTECTION AND DRAINAGE

1. Protect the geotextile/bentonite clay waterproofing membrane with CCW MiraDRAIN Drainage Composite.
2. Install the CCW MiraDRAIN Drainage Composite according to the detailed drawings for the specific installation requirements of the project.

END OF SECTION

SECTION 07210 - BUILDING INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

A. Concealed building insulation.
B. Exposed building insulation.
C. Loose-fill building insulation.

1.3 SUBMITTALS

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

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.

A. Surface-Burning Characteristics: ASTM E 84.
B. Fire-Resistance Ratings: ASTM E 119.
C. Combustion Characteristics: ASTM E 136.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

A. Glass-Fiber Insulation:

a. CertainTeed Corporation.
b. Johns Manville Corporation.
c. Knauf Fiber Glass.
d. Owens Corning.

2.2 INSULATING MATERIALS

A. General: Provide insulating materials that comply with requirements and with referenced standards.

A. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thicknesses, widths, and lengths. Thickness as required to fill completely fill the cavity.

B. Unfaced, Flexible Glass-Fiber Board Insulation: ASTM C 612, Type IA; ASTM C 553, Types I, II, and III; or ASTM C 665, Type I; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; and of the following properties:

A. Nominal density of not less than 1.5 lb/cu. ft. (24 kg/cu. m) nor more than 1.7 lb/cu. ft. (26 kg/cu. m), thermal resistivity of 4 deg F x h x sq. ft./Btu x in. at 75 deg F (27.7 K x m/W at 24 deg C).
B. Combustion Characteristics: Passes ASTM E 136.
C. Thickness: Minimum 1”.

C. Unfaced Mineral-Fiber Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers manufactured from glass; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively; passing ASTM E 136 for combustion characteristics.

1. Thickness: Refer to drawings.

2.3 INSULATION FASTENERS

A. Products: Subject to compliance with requirements, provide one of the following:

A. Adhesively Attached, Spindle-Type Anchors:

a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
b. Eckel Industries of Canada Limited; Stic-Klip Type N Fasteners.
c. Gemco; Spindle Type.

B. Insulation-Retaining Washers:

a. AGM Industries, Inc.; RC150.
b. AGM Industries, Inc.; SC150.
c. Gemco; Dome-Cap.
d. Gemco; R-150.
e. Gemco; S-150.

C. Anchor Adhesives:

a. AGM Industries, Inc.; TACTOO Adhesive.

b. Eckel Industries of Canada Limited; Stic-Klip Type S Adhesive.
c. Gemco; Tuff Bond Hanger Adhesive.

B. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of thickness indicated securely in position indicated with self-locking washer in place; and complying with the following requirements:

A. Plate: Perforated galvanized carbon-steel sheet, 0.030 inch (0.762 mm) thick by 2 inches (50 mm) square.
B. Spindle: Copper-coated, low carbon steel, fully annealed, 0.105 inch (2.67 mm) in diameter, length to suit depth of insulation indicated.

C. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- (0.41-mm-) thick galvanized steel sheet, with beveled edge for increased stiffness, sized as required to hold insulation securely in place, but not less than 1-1/2 inches (38 mm) square or in diameter.

A. Protect ends with capped self-locking washers incorporating a spring steel insert to ensure permanent retention of cap in the following locations:

a. Mechanical rooms and as noted on drawings.

D. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.

2.4 LOOSE-FILL INSULATION – Provide one of the following loose fill insulation products:

A. Cellulosic-Fiber Loose-Fill Insulation: ASTM C 739, chemically treated for flame-resistance, processing, and handling characteristics. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. International Cellulose Inc.

B. Glass-Fiber Loose-Fill Insulation: ASTM C 764, Type I for pneumatic application with maximum flame-spread and smoke-developed indexes of 5. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. CertainTeed Corporation.
b. Johns Manville Corporation.
c. Owens Corning.

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 or vapor retarders, including removing projections capable of puncturing vapor retarders or of interfering with insulation attachment.

3.3 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice and snow.

C. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Water-Piping Coordination: If water piping is located on inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.

E. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

3.4 INSTALLATION OF GENERAL BUILDING INSULATION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Install mineral-fiber blankets in cavities formed by framing members according to the following requirements:

   A. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
   B. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
   C. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.

C. Install board insulation on concrete substrates by adhesively attached, spindle-type insulation anchors as follows:

   A. Fasten insulation anchors to concrete substrates with insulation anchor adhesive according to anchor manufacturer's written instructions. Space anchors according to insulation manufacturer's written instructions for insulation type, thickness, and application indicated.
   B. After adhesive has dried, install board insulation by pressing insulation into position over spindles and securing it tightly in place with insulation-retaining washers, taking care not to compress insulation below indicated thickness.
   C. Where insulation will not be covered by other building materials, apply capped washers to tips of spindles.

D. Place loose-fill insulation into spaces indicated, by machine blowing, to comply with ASTM C 1015. Level horizontal applications to uniform thickness as indicated, lightly settle to uniform density, but do not compact excessively.

A. For cellulosic-fiber loose-fill insulation, comply with the Cellulose Insulation Manufacturers Association's Special Report #3, "Standard Practice for Installing Cellulose Insulation."

B. The contractor shall not fill eaves and prevent the proper operation of the soffit vents. The contractor may provide Eave Ventilation Troughs in order to maintain required clearances.

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 07210

SECTION 07311 - ASPHALT SHINGLES

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. Asphalt shingles.
2. Felt underlayment.
3. Self-adhering sheet underlayment.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 SUBMITTALS

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

B. Samples for Initial Selection: For each type of asphalt shingle, ridge and hip cap shingles indicated.

1. Include similar Samples of trim and accessories involving color selection.

C. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain ridge and hip cap shingles felt underlayment and self-adhering sheet underlayment through one source from a single asphalt shingle manufacturer.

B. Fire-Test-Response Characteristics: Provide asphalt shingle and related roofing materials with the fire-test-response characteristics indicated, as determined by testing identical products per test method 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. Exterior Fire-Test Exposure: Class A; ASTM E 108 or UL 790, for application and roof slopes indicated.

C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions. Store underlayment rolls on end on pallets or other raised surfaces. Do not double-stack rolls.

1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.

B. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit asphalt shingle roofing to be performed according to manufacturer's written instructions and warranty requirements.

1. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

1.8 WARRANTY

A. Installer’s Project Warranty: Roofing Installer's warranty, on warranty form at end of this Section, signed by roofing Installer, covering Work of this Section, in which roofing Installer agrees to repair or replace components of asphalt shingle roofing that fail in materials or workmanship within the following warranty period:

1. Warranty Period: Two years from date of Substantial Completion.

B. Manufacturer’s Special Project Warranty: Roofing Manufacturer’s warranty, signed by roofing Manufacturer, covering Work of this Section, in which roofing manufacturer agrees to repair or replace components of asphalt shingle roofing that fail in materials or workmanship within the following warranty period. This warranty specifically covers materials, labor, tear-off, disposal and workmanship for the entire warranty period.

1. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Products: Subject to compliance with requirements, provide one of the products specified.

2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

A. Laminated-Strip Asphalt Shingles: ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.

1. Products:

a. CertainTeed Corporation, Landmark TL;
b. GAF Materials Corporation; Timberline Select 40.

2. Strip Size: Manufacturer's standard.
3. Algae Resistance: Granules treated to resist algae discoloration.
4. Color and Blends: As selected by Architect from manufacturer's full range.

B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.

2.3 UNDERLAYMENT MATERIALS

A. Felts: ASTM D 226 or ASTM D 4869, Type II, asphalt-saturated organic felts, nonperforated.

B. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 40-mil-(1.0- mm-) thick, slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release paper backing; cold applied. Provide primer for adjoining concrete or masonry surfaces to receive underlayment.

1. Products:

a. Grace, W. R. & Co.; Grace Ice and Water Shield.
b. Johns Manville International, Inc.; Roof Defender.
c. Note: Paragraph 1.5A requires that all products be from a single source. The installer may install a self-adhering sheet underlayment by one of the manufacturers listed above if a notarized letter is received from the manufacturer of the shingle indicating that this deviation will not void the warranty provisions listed in this specification section.
d. Or equal product by Certainteed or GAF.

2.4 ACCESSORIES

A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.

B. Roofing Nails: ASTM F 1667; stainless-steel, or hot-dip galvanized steel wire shingle nails, minimum 0.120-inch- (3-mm-) diameter, **ring shank**, sharp-pointed, with a minimum 3/8-inch-(9.5-mm-) diameter flat head and of sufficient length to penetrate 3/4 inch (19 mm) into plywood decking. Nails shall not touch or penetrate the metal deck

1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.

C. Felt Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized steel wire with low profile capped heads or disc caps, 1-inch (25-mm) minimum diameter.

2.5 METAL FLASHING AND TRIM

A. Sheet Metal Flashing and Trim: Comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

1. Sheet Metal: Prepainted, metallic-coated steel.

B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item.

1. Apron Flashings: Fabricate with lower flange a minimum of 5 inches (125 mm) over and 4 inches (100 mm) beyond each side of downslope asphalt shingles and 6 inches (150 mm) up the vertical surface.
2. Step Flashings: Fabricate with a headlap of 2 inches (50 mm) and a minimum extension of 5 inches (125 mm) over the underlying asphalt shingle and up the vertical surface.
3. Cricket Flashings: Fabricate with concealed flange extending a minimum of 24 inches (600 mm) beneath upslope asphalt shingles and 6 inches (150 mm) beyond each side of roof curb and 6 inches (150 mm) above the roof plane.
4. Open Valley Flashings: Fabricate in lengths not exceeding 10 feet (3 m) with 1-inch- (25-mm-) high inverted-V profile at center of valley and equal flange widths of 12 inches (300 mm).
5. Drip Edges: Fabricate in lengths not exceeding 10 feet (3 m) with 2-inch (50-mm) roof deck flange and 2-inch fascia flange with 3/8-inch (9.6-mm) drip at lower edge.

C. Vent Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch (1.6 mm) thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof and extending at least 4 inches (100 mm) from pipe onto roof.

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 work.

1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.
3. 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 UNDERLAYMENT INSTALLATION

A. Single-Layer Felt Underlayment: Install single layer of felt underlayment on roof deck perpendicular to roof slope in parallel courses. Lap sides a minimum of 2 inches (50 mm) over

underlying course. Lap ends a minimum of 4 inches (100 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm). Fasten with felt underlayment roofing nails.

1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches (75 mm) in direction to shed water. Lap ends of felt not less than 6 inches (150 mm) over self-adhering sheet underlayment.

B. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated below lapped in direction to shed water. Lap sides not less than 3-1/2 inches (89 mm). Lap ends not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Roll laps with roller. Cover underlayment within seven days.
1. Eaves: Extend from edges of eaves 24 inches (600 mm) beyond interior face of exterior wall.
2. Rakes: Extend from edges of rake 24 inches (600 mm) beyond interior face of exterior wall.
3. Valleys: Extend from lowest to highest point 18 inches (450 mm) on each side.
4. Hips: Extend 18 inches (450 mm) on each side.
5. Ridges: Extend 36 inches (914 mm) on each side.
6. Sidewalls: Extend beyond sidewall 18 inches (450 mm) and return vertically against sidewall not less than 4 inches (100 mm).
7. Dormers, Chimneys, Skylights, and other Roof-Penetrating Elements: Extend beyond penetrating element 18 inches (450 mm) and return vertically against penetrating element not less than 4 inches (100 mm).

C. Metal-Flashed Open Valley Underlayment: Install two layers of 36-inch- (914-mm-) wide felt underlayment centered in valley. Stagger end laps between layers at least 72 inches (1830 mm). Lap ends of each layer at least 12 inches (300 mm) in direction to shed water, and seal with asphalt roofing cement. Fasten each layer to roof deck with nails.

1. Lap roof deck felt underlayment over first layer of valley felt underlayment at least 6 inches (150 mm).

3.3 METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.

C. Step Flashings: Install with a headlap of 2 inches (50 mm) and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.

D. Cricket Flashings: Install against the roof-penetrating element extending concealed flange beneath upslope asphalt shingles and beyond each side.

E. Open Valley Flashings: Install centrally in valleys, lapping ends at least 8 inches (200 mm) in direction to shed water. Fasten upper end of each length to roof deck beneath overlap.

1. Secure hemmed flange edges into metal cleats spaced **12 inches (300 mm)** apart and fastened to roof deck.

F. Rake Drip Edges: Install rake drip edge flashings over underlayment and fasten to roof deck.

G. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof sheathing.

H. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

3.4 ASPHALT SHINGLE INSTALLATION

A. Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip with self-sealing strip face up at roof edge.

1. Extend asphalt shingles 1/2 inch (13 mm) over fascia at eaves and rakes.
2. Install starter strip along rake edge.

C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

D. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full length first course followed by cut second course, repeating alternating pattern in succeeding courses.

E. Fasten asphalt shingle strips with a minimum of four roofing nails located according to manufacturer's written instructions.

F. Open Valleys: Cut and fit asphalt shingles at open valleys, trimming upper concealed corners of shingle strips. Maintain uniform width of exposed open valley highest to lowest point.

1. Set valley edge of asphalt shingles in a 3-inch- (75-mm-) wide bed of asphalt roofing cement.
2. Do not nail asphalt shingles to metal open valley flashings.

G. Ridge and Hip Cap Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

3.5 ROOFING INSTALLER'S WARRANTY

A. WHEREAS <**Insert name**> of <**Insert address**>, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: <**Insert name of Owner.**>
2. Address: <**Insert address.**>
3. Building Name/Type: <**Insert information.**>
4. Address: <**Insert address.**>
5. Area of Work: <**Insert information.**>

6. Acceptance Date: <**Insert date.**>
7. Warranty Period: <**Insert time.**>
8. Expiration Date: <**Insert date.**>

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

   a. lightning;
   b. peak gust wind speed exceeding 80 mph (m/sec);
   c. fire;
   d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
   e. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this <**Insert day**> day of <**Insert month**>, <**Insert year**>.

1. Authorized Signature: <**Insert signature.**>
2. Name: <**Insert name.**>
3. Title: <**Insert title.**>

END OF SECTION 07311

SECTION 07527 - SBS-MODIFIED BITUMINOUS MEMBRANE ROOFING

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. SBS-modified bituminous membrane roofing.
2. Roof insulation.

1.3 DEFINITIONS

A. Roofing Terminology: Refer to ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.

B. Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoise for mop-applied roofing asphalt and 75 centipoise for mechanical spreader-applied roofing asphalt, within a range of plus or minus 25 deg F (14 deg C), measured at the mop cart or mechanical spreader immediately before application.

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide installed roofing membrane and base flashings that remain watertight; do not permit the passage of water; and resist specified uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.

C. FMG Listing: Provide roofing membrane, base flashings, and component materials that comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in FMG's "Approval Guide" for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.

1. Fire/Windstorm Classification: Class 1A-105.
2. Hail Resistance: MH.

1.5 SUBMITTALS

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

B. Shop Drawings: For roofing system. Include plans, elevations, sections, details, and attachments to other Work.

1. Base flashings, cants, and membrane terminations.
2. Tapered insulation, including slopes.
3. Crickets, saddles, and tapered edge strips, including slopes.
4. Insulation fastening patterns.

C. Samples for Verification: For the following products:

1. 12-by-12-inch (300-by-300-mm) square of smooth-surfaced roofing membrane sheet.
2. 12-by-12-inch (300-by-300-mm) square of mineral-granule-surfaced roofing membrane cap sheet, of color specified.
3. Six insulation fasteners of each type, length, and finish.

D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

E. Manufacturer Certificates: Signed by roofing manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

1. Submit evidence of meeting performance requirements.

F. Warranties: Special warranties specified in this Section.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's warranty.

B. Manufacturer Qualifications: A qualified manufacturer that has FMG approval for roofing system identical to that used for this Project.

C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

D. Source Limitations: Obtain components for roofing system from or approved by roofing system manufacturer.

E. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure: Class A ASTM E 108, for application and roof slopes indicated.

F. Preinstallation Conference: Conduct conference at Project site. Comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.8 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.9 WARRANTY

A. Special Warranty: Manufacturer's warranty, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period. Failure includes roof leaks. Special warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, walkway products and other components of roofing system. The Roofing Manufacturer's Guarantee shall

guarantee at the manufacturer's own cost and expense, to made or cause to be made such repairs to or replacement of, to correct any and all faulty installations or materials of the roofing system, to keep the roofing system in a watertight condition throughout the 10 year guarantee period. The guarantee shall not be prorated. The executed guarantee shall be delivered to the Architect in three original counterparts prior to acceptance of the Work. Any interior wall and ceiling finishes damaged by failure to correct any problems in a timely fashion shall be paid by the roofing contractor and/or roofing manufacturer.

1. The definition of the roofing system is the materials and methods used from the deck up. Excluded are the metal counter flashing, edging, caps, and copings, vent covers (pre-manufactured) and roof drain assemblies. The manufacturer is to include a list of all component parts of the roofing system that shall be guaranteed.

2. The manufacturer's letter shall also state acceptance of the installer of the roofing system.

3. Warranty Period: 10 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. SBS-Modified Bituminous Membrane Roofing:

   a. Johns Manville International, Inc.
   b. Siplast, Inc.
   c. Soprema Roofing and Waterproofing Inc.
   d. TAMKO Roofing Products, Inc.

   Note: All approved roofing manufacturers, listed above, shall provide a two-ply roofing system equal to Siplast's Paradiene 20/30FR.

B. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 SBS-MODIFIED ASPHALT-SHEET MATERIALS

A. Roofing Membrane Sheet: ASTM D 6163, Grade S, Type I or II, glass-fiber-reinforced SBS-modified asphalt sheet; smooth surfaced; suitable for application method specified.

B. Roofing Membrane Cap Sheet: ASTM D 6163, Grade G, Type I or II, glass-fiber-reinforced, SBS-modified asphalt sheet; granular surfaced; suitable for application method specified, and as follows:

1. Granule Color: White.

2.3 BASE FLASHING SHEET MATERIALS

A. Flashing Sheet: ASTM D 6163, Grade G, Type I or II, glass-fiber-reinforced SBS-modified asphalt sheet; granular surfaced; suitable for application method specified, and as follows:

1. Granule Color: White.

2.4 AUXILIARY ROOFING MEMBRANE MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing membrane.

B. Roofing Asphalt: ASTM D 312, Type III or IV as recommended by roofing system manufacturer for application.

C. Roofing Asphalt: ASTM D 6152, SEBS modified.

D. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.

E. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.

F. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing membrane components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

G. Metal Flashing Sheet: Metal flashing sheet is specified in Division 7 Section "Sheet Metal Flashing and Trim."

H. Roofing Granules: Ceramic-coated roofing granules, No. 11 screen size with 100 percent passing No. 8 (2.36-mm) sieve and 98 percent of mass retained on No. 40 (0.425-mm) sieve, color to match roofing membrane.

I. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

2.5 ROOF INSULATION

A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, felt or glass-fiber mat facer on both major surfaces.

1. Manufacturers:

a. Apache Products Company.

b. Atlas Roofing Corporation.
c. Celotex Corporation.
d. Firestone Building Products Company.
e. GAF Materials Corporation.
f. Honeywell Commercial Roofing Systems.
g. Hunter Panels, LLC.
h. Johns Manville International, Inc.
i. Koppers Industries.

C. Composite Polyisocyanurate Board Insulation: ASTM C 1289, faced with insulation board on one major surface, as indicated below by type, and felt or glass-fiber mat facer on the other.

1. Manufacturers:

a. Apache Products Company.
b. Atlas Roofing Corporation.
c. Celotex Corporation.
d. Firestone Building Products Company.
e. GAF Materials Corporation.
f. Honeywell Commercial Roofing Systems.
g. Hunter Panels, LLC.
h. Johns Manville International, Inc.
i. Koppers Industries.
j. RMAX.

2. Type III (perlite-insulation-board facer), 1/2 inch (13 mm) thick.

D. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches unless otherwise indicated.

E. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.6 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.

C. Insulation Cant Strips: ASTM C 728, perlite insulation board.

D. Insulation Cant Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.

E. Substrate Joint Tape: 6- or 8-inch- (150- or 200-mm-) wide, coated, glass-fiber joint tape.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:

1. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
2. Verify that cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Division 5 Section "Steel Deck."
4. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.
5. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 INSULATION INSTALLATION

A. Comply with roofing system manufacturer's written instructions for installing roof insulation.

B. Install one lapped base sheet course and mechanically fasten to substrate according to roofing system manufacturer's written instructions.

C. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes greater than 45 degrees.

D. Install tapered insulation under area of roofing to conform to slopes indicated.

E. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.

1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.

F. Install one or more layers of insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2 inches (50 mm) or greater, install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.

G. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

H. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

1. Fasten insulation according to requirements in FMG's "Approval Guide" for specified Windstorm Resistance Classification.

3.4 ROOFING MEMBRANE INSTALLATION, GENERAL

A. Install roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."

B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

C. Where roof slope exceeds 1/2 inch per 12 inches (1:24) install roofing membrane sheets parallel with slope.

1. Backnail roofing membrane sheets to nailer strips or substrate according to roofing system manufacturer's written instructions.

D. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.
2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

E. Asphalt Heating: Do not raise roofing asphalt temperature above equiviscous temperature range more than one hour before time of application. Do not exceed roofing asphalt manufacturer's recommended temperature limits during roofing asphalt heating. Do not heat roofing asphalt within 25 deg F (14 deg C) of flash point. Discard roofing asphalt maintained at a temperature exceeding finished blowing temperature for more than 4 hours.

F. Asphalt Heating: Heat and apply SEBS-modified roofing asphalt according to roofing system manufacturer's written instructions.

G. Substrate-Joint Penetrations: Prevent roofing asphalt from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.5 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install modified bituminous roofing membrane sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:

1. Adhere to substrate in a solid mopping of hot roofing asphalt applied at not less than 425 deg F (218 deg C).

2. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.

B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.

1. Repair tears and voids in laps and lapped seams not completely sealed.
2. Apply roofing granules to cover exuded bead at laps while bead is hot.

C. Install roofing membrane sheets so side and end laps shed water.

3.6 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
1. Flashing Sheet Application: Adhere flashing sheet to substrate in a solid mopping of hot roofing asphalt applied at not less than 425 deg F (218 deg C). Apply hot roofing asphalt to back of flashing sheet if recommended by roofing system manufacturer.

B. Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing membrane and 4 inches (100 mm) onto field of roofing membrane.

C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.

1. Seal top termination of base flashing.

D. Install roofing membrane cap-sheet stripping where metal flanges and edgings are set on membrane roofing according to roofing system manufacturer's written instructions.

3.7 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

END OF SECTION 07552

SECTION 07620 - SHEET METAL FLASHING AND TRIM

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 sheet metal flashing and trim:

1. Formed roof drainage system.
2. Formed low-slope roof flashing and trim.
3. Formed wall flashing and trim.

1.3 PERFORMANCE REQUIREMENTS

A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing, rattling, leaking, and fastener disengagement.

B. Thermal Movements: Provide sheet metal flashing and trim that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of sheet metal and trim thermal movements. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

C. Water Infiltration: Provide sheet metal flashing and trim that do not allow water infiltration to building interior.

1.4 SUBMITTALS

A. Shop Drawings: Show layouts of sheet metal flashing and trim, including plans and elevations. Distinguish between shop- and field-assembled work. Include the following:

1. Identify material, thickness, weight, and finish for each item and location in Project.
2. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
3. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.
4. Details of expansion-joint covers, including showing direction of expansion and contraction.

B. Samples for Initial Selection: For each type of sheet metal flashing and trim indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

1.5 QUALITY ASSURANCE

A. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

B. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1. Meet with Owner, Architect, Owner's insurer if applicable, Installer, and installers whose work interfaces with or affects sheet metal flashing and trim including installers of roofing materials, roof accessories, unit skylights, and roof-mounted equipment.
2. Review methods and procedures related to sheet metal flashing and trim.
3. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
4. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver sheet metal flashing materials and fabrications undamaged. Protect sheet metal flashing and trim materials and fabrications during transportation and handling.

B. Unload, store, and install sheet metal flashing materials and fabrications in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack materials on platforms or pallets, covered with suitable weathertight and ventilated covering. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

1.7 COORDINATION

A. Coordinate installation of sheet metal flashing and trim with interfacing and adjoining construction to provide a leakproof, secure, and noncorrosive installation.

PART 2 - PRODUCTS

2.1 SHEET METALS

A. Prepainted, Metallic-Coated Steel Sheet: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.
2. Exposed Finishes: Apply the following coil coating:

a. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1) Fluoropolymer 3-Coat System: Manufacturer's standard 3-coat, thermocured system consisting of specially formulated inhibitive primer, fluoropolymer color coat, and clear fluoropolymer topcoat, with both color coat and clear topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight, with a minimum total dry film thickness of 1.5 mil (0.038 mm); complying with physical properties and coating performance requirements of AAMA 2605, except as modified below:

a) Humidity Resistance: 2000 hours.
b) Salt-Spray Resistance: 2000 hours.

2) Color: As selected by Architect from manufacturer's full range.

2.2 UNDERLAYMENT MATERIALS

A. Felts: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, nonperforated.

B. Slip Sheet: Rosin-sized paper, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m).

2.3 MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads.

1. Exposed Fasteners: Heads matching color of sheet metal by means of plastic caps or factory-applied coating.
2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws, gasketed, with hex washer head.
3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
4. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

C. Sealing Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealing tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape.

D. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

E. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

F. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.4 FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of item indicated. Shop fabricate items where practicable. Obtain field measurements for accurate fit before shop fabrication.

B. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.

C. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.

1. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.

D. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.

E. Expansion Provisions: Where lapped or bayonet-type expansion provisions in the Work cannot be used, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with elastomeric sealant concealed within joints.

F. Conceal fasteners and expansion provisions where possible on exposed-to-view sheet metal flashing and trim, unless otherwise indicated.

G. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

1. Thickness: As recommended by SMACNA's "Architectural Sheet Metal Manual" and FMG Loss Prevention Data Sheet 1-49 for application but not less than thickness of metal being secured.

2.5 ROOF DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section indicated, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Furnish flat-stock gutter spacers and gutter brackets fabricated from same metal as gutters, of size recommended by SMACNA but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters.

1. Gutter Style: A.
2. Expansion Joints: Lap type.
3. Accessories: Valley baffles.
4. Gutters with Girth up to 15 Inches (380 mm): Fabricate from the following material:

a. Prepainted, Metallic-Coated Steel: 0.0217 inch (0.55 mm) thick.

B. Downspouts: Fabricate rectangular downspouts complete with mitered elbows. Furnish with metal hangers, from same material as downspouts, and anchors.

1. Manufactured Hanger Style: Hanger Design Figure 1-35A in Fifth edition of SMACNA.
2. Fabricate downspouts from the following material:

a. Prepainted, Metallic-Coated Steel: 0.0217 inch (0.55 mm) thick.

C. Parapet Scuppers: Fabricate scuppers of dimensions required with closure flange trim to exterior, 4-inch- (100-mm-) wide wall flanges to interior, and base extending 4 inches (100 mm) beyond cant or tapered strip into field of roof. Fasten gravel guard angles to base of scupper.

1. Fabricate parapet scuppers from the following material:

a. Prepainted, Metallic-Coated Steel: 0.0276 inch (0.7 mm) thick.

D. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape indicated complete with outlet tubes, exterior flange trim, and built-in overflows.

1. Fabricate conductor heads from the following material:

a. Prepainted, Metallic-Coated Steel: 0.0276 inch (0.7 mm) thick.

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Copings: Fabricate in minimum 96-inch- (2400-mm-) long, but not exceeding 10-foot- (3-m-) long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, seal, and solder or weld watertight.

1. Joint Style: Butt, with 6-inch- (150-mm-) wide exposed cover plates.
2. Fabricate copings from the following material:

a. Prepainted, Metallic-Coated Steel: 0.0396 inch (1.0 mm) thick.

B. Expansion-Joint Cover: Fabricate from the following material:

1. Prepainted, Metallic-Coated Steel: 0.0336 inch (0.85 mm) thick.

C. Base Flashing: Fabricate from the following material:

1. Prepainted, Metallic-Coated Steel: 0.0276 inch (0.7 mm) thick.

D. Counterflashing: Fabricate from the following material:

1. Prepainted, Metallic-Coated Steel: 0.0276 inch (0.7 mm) thick.

E. Flashing Receivers: Fabricate from the following material:

1. Prepainted, Metallic-Coated Steel: 0.0276 inch (0.7 mm) thick.

2.7 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical and painted 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.

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.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, welding rods, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Torch cutting of sheet metal flashing and trim is not permitted.

B. 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 fabricator or manufacturers of dissimilar metals.

1. Coat side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing metal flashing 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 for waterproof performance.

C. Install exposed sheet metal flashing and trim without excessive oil canning, buckling, and tool marks.

D. Install sheet metal flashing and trim true to line and levels indicated. Provide uniform, neat seams with minimum exposure of solder, welds, and elastomeric sealant.

E. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

1. Space cleats not more than 12 inches (300 mm) apart. Anchor each cleat with two fasteners. Bend tabs over fasteners.

F. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet (3 m) with no joints allowed within 24 inches (600

mm) of corner or intersection. Where lapped or bayonet-type expansion provisions cannot be used or would not be sufficiently watertight, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with elastomeric sealant concealed within joints.

G. Fasteners: Use fasteners of sizes that will penetrate substrate not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.

1. Galvanized or Prepainted, Metallic-Coated Steel: Use stainless-steel fasteners.
2. Stainless Steel: Use stainless-steel fasteners.

H. Seal joints with elastomeric sealant as required for watertight construction.

1. Where sealant-filled joints are used, embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is moderate, between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement either way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).
2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

I. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pretin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm) except where pretinned surface would show in finished Work.

1. Do not solder prepainted, metallic-coated steel sheet.
2. Stainless-Steel Soldering: Pretin edges of uncoated sheets to be soldered using solder recommended for stainless steel and phosphoric acid flux. Promptly wash off acid flux residue from metal after soldering.
3. Do not use open-flame torches for soldering. Heat surfaces to receive solder and flow solder into joints. Fill joints completely. Completely remove flux and spatter from exposed surfaces.

3.3 ROOF DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof drainage items to produce complete roof drainage system according to SMACNA recommendations and as indicated. Coordinate installation of roof perimeter flashing with installation of roof drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints or with lapped joints sealed with elastomeric sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchored straps spaced not more than 30 inches apart. Provide end closures and seal watertight with sealant. Slope to downspouts.

1. Fasten gutter spacers to front and back of gutter.
2. Loosely lock straps to front gutter bead and anchor to roof deck.
3. Anchor and loosely lock back edge of gutter to continuous cleat.
4. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches (600 mm) apart.
5. Install gutter with expansion joints at locations indicated but not exceeding 30 feet apart. Install expansion joint caps.

C. Downspouts: Join sections with 1-1/2-inch (38-mm) telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1500 mm) o.c. in between.
   1. Connect downspouts to underground drainage system indicated.

D. Parapet Scuppers: Install scuppers where indicated through parapet. Continuously support scupper, set to correct elevation, and seal flanges to interior wall face, over cants or tapered edge strips, and under roofing membrane.

   1. Anchor scupper closure trim flange to exterior wall and seal or solder to scupper.
   2. Loosely lock front edge of scupper with conductor head.
   3. Seal or solder exterior wall scupper flanges into back of conductor head.

E. Conductor Heads: Anchor securely to wall with elevation of conductor head rim 1 inch (25 mm) below scupper discharge.

F. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints a minimum of 4 inches (100 mm) in direction of water flow.

3.4 ROOF FLASHING INSTALLATION

A. General: Install sheet metal roof flashing and trim to comply with performance requirementsand SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners where possible, set units true to line, and level as indicated. Install work with laps, joints, and seams that will be permanently watertight.

B. Copings: Anchor to resist uplift and outward forces according to recommendations in FMG Loss Prevention Data Sheet 1-49 for specified wind zone and as indicated.

   1. Interlock exterior bottom edge of coping with continuous cleats anchored to substrate at 16-inch (400-mm) centers.
   2. Anchor interior leg of coping with screw fasteners and washers at 16 inch centers.

3.5 CLEANING AND PROTECTION

A. Clean and neutralize flux materials. Clean off excess solder and sealants.

B. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain in a clean condition during construction.

C. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07620

SECTION 07710 - ROOF ACCESSORIES

PART 1 - GENERAL

1.01 Summary

A. Section includes: Metal Gable Roof Vents

B. All sheet metal Louver Dormer products shall be manufactured in sizes, styles, materials, and designated airflows as indicated below and shown on drawings.

1. Louvers to be shop fabricated brake formed with watertight frame construction and to include a insect screen of compatible material.

2. Dormer Louver to have a minimum free area of 40% to provide adequate ventilation of attic area.

3. Dormer to include full 12” wide roof flange at sides and back of dormer to allow watertight installation.

4. Dormer to include sub-frame of welded aluminum tube, plywood cladding, and flexible self-adhering rubberized membrane waterproofing as dictated by size)

C. SUBMITTALS

1. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

2. Shop Drawings: Show layouts of sheet metal flashing and trim, including plans and elevations. Distinguish between shop- and field-assembled work. Include the following:

   a. Identify material, thickness, weight, and finish for each item and location in Project.
   b. Details for forming sheet metal flashing and trim, including profiles, shapes, seams, and dimensions.
   c. Details for fastening, joining, supporting, and anchoring sheet metal flashing and trim, including fasteners, clips, cleats, and attachments to adjoining work.

3. Samples for Initial Selection: For each type of gable vent indicated with factory-applied color finishes.

   a. Include Samples indicating color selection.

4. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below:

   a. 12 inches by 12 inches sample

D. QUALITY ASSURANCE

1. Sheet Metal Flashing and Trim Standard: Comply with SMACNA's "Architectural Sheet Metal Manual." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

E. Special Warranty for Weathertightness: Written warranty, signed by manufacturer agreeing to repair or replace assemblies that fail to remain weathertight within specified warranty period.

1. Warranty Period: 2 years from date of Substantial Completion.

PART 2 – PRODUCTS

2.01 Manufacturer

A. Subject to requirements, provide products by one of the following:

1. CopperCraft, Inc.
2. Or approved equal

2.02 Materials

A. Prefinished Aluminum: Sheet aluminum to be (.032, .040, .050) aluminum alloy 3003-H14 lock forming quality (LFQ) ASTM Specification B209. Finish to be Kynar 500 formulization in a standard color as selected by the Architect.

PART 3 – EXECUTION

3.01 Inspection

A. All surfaces or openings to which Dormer is to be applied shall be smooth, sound, clean, plumb, dry, and free from defects that might affect the application.

3.02 Installation

A. All sheet metal work shall conform to standards set forth in the following publications:

1. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) Architectural Sheet Metal Manual.

2. CDA Copper Design Manual, published by the Copper Development Association.

3. Copper and Common Sense – Sheet Copper Design Principles and Construction Techniques Manual, Published by Revere Copper Products

B. Fasten dormer to roof structure as designated on shop drawings and approved by the Architect.

END OF SECTION 07710

SECTION 07719 - METAL SOFFIT PANELS

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 DEFINITION

A. Metal Wall Panel Assembly: Metal wall panels, attachment system components, miscellaneous metal framing, thermal insulation, and accessories necessary for a complete weathertight system.

1.3 PERFORMANCE REQUIREMENTS

A. General: Provide metal wall panel assemblies that comply with performance requirements specified as determined by testing manufacturers' standard assemblies similar to those indicated for this Project, by a qualified testing and inspecting agency.

B. Structural Performance: Provide metal wall panel assemblies capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated, based on testing according to ASTM E 1592:

1. Wind Loads: Determine loads based on the following minimum design wind pressures:
   a. Uniform pressure as indicated on Drawings.

2. Deflection Limits: Engineer metal wall panel assemblies to withstand test pressures with deflection no greater than 1/180 of the span and no evidence of material failure, structural distress, or permanent deformation exceeding 0.2 percent of the clear span.

   a. Test Pressures: 150 percent of inward and outward wind-load design pressures.

C. Thermal Movements: Provide metal wall panel assemblies 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 joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), 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 wall panel and accessory.

B. Shop Drawings: Show fabrication and installation layouts of metal wall panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, flashings, closures, and accessories; and special details. Distinguish between factory- and field-assembled work.

1. Accessories: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches (1:10):

   a. Flashing and trim.

2. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Initial Selection: For each type of metal wall panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.
2. Include manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each sealant exposed to view.

D. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of metal-faced composite wall panels.

1. Installer's responsibilities include fabricating and installing metal wall panel assemblies and providing professional engineering services needed to assume engineering responsibility.
2. Engineering Responsibility: Preparation of data for metal wall panels, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Fabricator Qualifications: Certified by metal-faced composite wall panel manufacturer to fabricate and install manufacturer's wall panel system.

C. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing indicated, as documented according to ASTM E 548.

D. Source Limitations: Obtain each type of metal wall panel through one source from a single manufacturer.

E. Product Options: Drawings indicate size, profiles, and dimensional requirements of metal wall panels and are based on the specific system indicated. Refer to Division 1 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.

F. Fire-Resistance Ratings: Where indicated, provide metal wall panels identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

1. Combustion Characteristics: ASTM E 136.
2. Metal wall panels shall be identified with appropriate markings of applicable testing and inspecting agency.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, sheets, metal wall panels, and other manufactured items so as not to be damaged or deformed. Package metal wall panels for protection during transportation and handling.

B. Unload, store, and erect metal wall panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Protect strippable protective covering on metal wall panels from exposure to sunlight and high humidity, except to extent necessary for period of metal wall panel installation.

1.7 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit assembly of metal wall panels to be performed according to manufacturers' written instructions and warranty requirements.

B. Field Measurements: Verify locations of structural members and wall opening dimensions by field measurements before metal wall panel fabrication and indicate measurements on Shop Drawings.

1.8 COORDINATION

A. Coordinate metal wall panel assemblies with rain drainage work, flashing, trim, and construction of soffits, and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal wall panel assemblies that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures, including rupturing, cracking, or puncturing.
b. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal wall panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 PANEL MATERIALS

A. 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.

1. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation; structural quality.
2. Exposed Finishes: Apply the following coil coating, as specified or indicated on Drawings.

a. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

1) Fluoropolymer Two-Coat System: Manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with physical properties and coating performance requirements of AAMA 2605, except as modified below:

a) Humidity Resistance: 2000 hours.
b) Salt-Spray Resistance: 2000 hours.

3. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil (0.013 mm).

B. Panel Sealants:

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
2. Joint Sealant: ASTM C 920; elastomeric polyurethane, polysulfide, or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal wall panels and remain weathertight; and as recommended in writing by metal wall panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C 1311.

2.3 MISCELLANEOUS METAL FRAMING

A. Steel Sheet Components, General: Complying with ASTM C 645 requirements for metal and with manufacturer's standard corrosion-resistant zinc coating.

B. Subgirts: C- or Z-shaped sections fabricated from 0.0598-inch (1.5-mm) bare steel thickness, shop-painted, cold-formed, metallic-coated steel sheet.

C. Zee Clips: 0.079-inch (2.0-mm) bare steel thickness, cold-formed, galvanized steel sheet.

D. Hat-Shaped, Rigid Furring Channels: ASTM C 645.

1. Minimum Base Metal Thickness: 0.0312 inch (0.79 mm).
2. Depth: As indicated.

E. Cold-Rolled Furring Channels: 0.0538-inch (1.37-mm) bare steel thickness, with minimum 1/2-inch- (13-mm-) wide flange.

1. Depth: As indicated.
2. Furring Brackets: Adjustable, corrugated-edge type of steel sheet with minimum bare steel thickness of 0.0312 inch (0.79 mm).
3. Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch- (1.59-mm-) diameter wire, or double strand of 0.0475-inch- (1.21-mm-) diameter wire.

F. Z-Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (32 mm), wall attachment flange of 7/8 inch (22 mm), minimum bare metal thickness of 0.0179 inch (0.45 mm), and depth required to fit insulation thickness indicated.

G. Fasteners for Metal Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

2.4 MISCELLANEOUS MATERIALS

A. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide exposed fasteners with heads matching color of metal wall panels by means of plastic caps or factory-applied coating.
1. Fasteners for Wall Panels: Self-drilling or self-tapping 410 stainless or zinc-alloy steel hex washer head, with EPDM or PVC washer under heads of fasteners bearing on weather side of metal wall panels.
2. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
3. Blind Fasteners: High-strength aluminum or stainless-steel rivets.

B. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.5 METAL SOFFIT PANELS

A. General: Provide factory-formed metal soffit panels designed to be field assembled by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.

B. V-Groove-Profile Metal Soffit Panels. Perforated panels formed with vertical panel edges and intermediate stiffening ribs symmetrically spaced between panel edges; with V-groove joint between panels.

1. Manufacturers:
   a. Berridge Manufacturing Company, Vee-Panel.
   b. Fabral, Inc.
   c. Petersen Aluminum Corporation.
   d. AEP

2. Material: Same material, finish, and color as Fascia panel.

3. Material: Zinc-coated (galvanized) steel sheet, 24 ga. thick.

   a. Exterior Finish: Fluoropolymer.
   b. Color: As selected by Architect from manufacturer's full range.

4. Panel Coverage: 12 inches (305 mm).
5. Panel Height: 0.375 inch (10 mm).

2.6 ACCESSORIES

A. Flashing and Trim: Formed from 0.0179-inch- (0.45-mm-) thick, zinc-coated (galvanized) steel sheet or aluminum-zinc alloy-coated steel sheet prepainted with coil coating. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, bases, drips, sills, jambs, corners, endwalls, framed openings, rakes, fasciae, parapet caps, soffits, reveals, and fillers. Finish flashing and trim with same finish system as adjacent metal wall panels.

2.7 FABRICATION

A. General: Fabricate and finish metal wall panels and accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

   1. Fabricate wall panels with panel stiffeners as required to maintain fabrication tolerances and to withstand design loads.

B. Fabricate metal wall panels in a manner that eliminates condensation on interior side of panel and with joints between panels designed to form weathertight seals.

C. Sheet Metal Accessories: Fabricate flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of item indicated.

   1. Form exposed sheet metal accessories that are without excessive oil canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
   2. Seams for Other Than Aluminum: Fabricate nonmoving seams in accessories with flat-lock seams. Tin edges to be seamed, form seams, and solder.
   3. Sealed Joints: Form nonexpansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.
   4. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of accessories exposed to view.
   5. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal recommended by metal wall panel manufacturer.

      a. Size: As recommended by SMACNA's "Architectural Sheet Metal Manual" or metal wall panel manufacturer for application but not less than thickness of metal being secured.

2.8 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 and painted 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.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal wall panel supports, and other conditions affecting performance of work.

1. Examine primary and secondary wall framing to verify that girts, angles, channels, studs, and other structural panel support members and anchorage have been installed within alignment tolerances required by metal wall panel manufacturer.
2. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.

B. Examine roughing-in for components and systems penetrating metal wall panels to verify actual locations of penetrations relative to seam locations of metal wall panels before metal wall panel installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of substances harmful to insulation, including removing projections capable of interfering with insulation attachment.

B. Install flashings and other sheet metal to comply with requirements specified in Division 7 Section "Sheet Metal Flashing and Trim."

C. Install fasciae and copings to comply with requirements specified in Division 7 Section "Sheet Metal Flashing and Trim."

D. Miscellaneous Framing: Install subgirts, base angles, sills, furring, and other miscellaneous wall panel support members and anchorage according to ASTM C 754 and metal wall panel manufacturer's written recommendations.

1. Soffit Framing: Wire-tie or clip furring channels to supports, as required to comply with requirements for assemblies indicated.

3.3 METAL SOFFIT PANEL INSTALLATION, GENERAL

A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts and subgirts, unless otherwise indicated. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.

1. Field cutting of metal wall panels by torch is not permitted.

2. Shim or otherwise plumb substrates receiving metal soffit panels.
3. Flash and seal metal panels with weather closures at eaves, rakes, and at perimeter of all openings. Fasten with self-tapping screws. Do not begin installation until weather barrier and flashings that will be concealed by metal panels are installed.
4. Install screw fasteners in predrilled holes.
5. Locate and space fastenings in uniform vertical and horizontal alignment.
6. Install flashing and trim as metal panel work proceeds.
7. Locate panel splices over, but not attached to, structural supports. Stagger panel splices and end laps to avoid a four-panel lap splice condition.
8. Apply elastomeric sealant continuously between metal base channel (sill angle) and concrete, and elsewhere as indicated or, if not indicated, as necessary for waterproofing.
9. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-tapping screws. Fasten flashings and trim around openings and similar elements with self-tapping screws.
10. Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

B. Fasteners:

1. Steel Soffit Panels: Use stainless-steel fasteners for surfaces exposed to the exterior and galvanized steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating, by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal wall panel manufacturer.

D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated or, if not indicated, types recommended by metal panel manufacturer.

1. Seal metal panel end laps with double beads of tape or sealant, full width of panel. Seal side joints where recommended by metal wall panel manufacturer.
2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

3.4 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. Install components required for a complete metal wall panel assembly including trim, copings, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.

3.5 ERECTION TOLERANCES

A. Installation Tolerances: Shim and align metal wall panel units within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m), nonaccumulative, on level, plumb, and location lines as indicated and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.6 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal wall panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On

completion of metal wall panel installation, clean finished surfaces as recommended by metal wall panel manufacturer. Maintain in a clean condition during construction.

B. After metal wall panel installation, clear weep holes and drainage channels of obstructions, dirt, and sealant.

C. Replace metal wall panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07719

SECTION 07841 - THROUGH-PENETRATION FIRESTOP SYSTEMS

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 through-penetration firestop systems for penetrations through the following fire-resistance-rated assemblies, including both empty openings and openings containing penetrating items:

1. Walls and partitions.
2. Smoke barriers.

B. Related Sections include the following:

1. Division 15 Sections specifying duct and piping penetrations.
2. Division 16 Sections specifying cable and conduit penetrations.

1.3 PERFORMANCE REQUIREMENTS

A. General: For the following constructions, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assembly penetrated.

1. Fire-resistance-rated load-bearing walls, including partitions, with fire-protection-rated openings.
2. Fire-resistance-rated non-load-bearing walls, including partitions, with fire-protection-rated openings.

B. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, as determined per ASTM E 814, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.

C. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, as determined per ASTM E 814, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:

1. Penetrations located outside wall cavities.
2. Penetrations located outside fire-resistive shaft enclosures.
3. Penetrations located in construction containing fire-protection-rated openings.
4. Penetrating items larger than 4-inch- (100-mm-) diameter nominal pipe or 16 sq. in. (100 sq. cm) in overall cross-sectional area.

D. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.

1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
2. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

E. For through-penetration firestop systems exposed to view, provide products with flame-spread ratings of less than 25 and smoke-developed ratings of less than 450, as determined per ASTM E 84.

1.4 SUBMITTALS

A. Product Data: For each type of through-penetration firestop system product indicated.

B. Shop Drawings: For each through-penetration firestop system, show each kind of construction condition penetrated, relationships to adjoining construction, and kind of penetrating item. Include firestop design designation of testing and inspecting agency acceptable to authorities having jurisdiction that evidences compliance with requirements for each condition indicated.

1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each through-penetration firestop system configuration for construction and penetrating items.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed through-penetration firestop systems similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in "Performance Requirements" Article:

1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, Warnock Hershey, or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
2. Through-penetration firestop systems are identical to those tested per ASTM E 814. Provide rated systems complying with the following requirements:.

a. Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.
b. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by the following:

1) UL in "Fire Resistance Directory."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer; date of manufacture; lot number; shelf life, if applicable; qualified testing and inspecting agency's classification marking applicable to Project; curing time; and mixing instructions for multicomponent materials.

B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.8 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.

C. Notify Architect at least seven days in advance of through-penetration firestop system installations; confirm dates and times on days preceding each series of installations.

D. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until Architect and authorities having jurisdiction, if required, have examined each installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Firestop Systems Inc.
2. Hilti Construction Chemicals, Inc.
3. Specified Technologies Inc.
4. 3M Fire Protection Products.
5. Tremco.

2.2 FIRESTOPPING, GENERAL

A. Compatibility: Provide through-penetration firestop systems that are compatible with one another, with the substrates forming openings, and with the items, if any, penetrating through-

penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.

B. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by the qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:

1. Permanent forming/damming/backing materials, including the following:

   a. Slag-/rock-wool-fiber insulation.
   b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
   c. Fire-rated form board.
   d. Fillers for sealants.

2. Temporary forming materials.
3. Substrate primers.
4. Collars.
5. Steel sleeves.

2.3 FILL MATERIALS

A. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.

B. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

C. Mortars: Prepackaged, dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

D. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

E. Silicone Sealants: Moisture-curing, single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:

1. Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

2.4 MIXING

A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with written recommendations of firestop system manufacturer and the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.3 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

A. General: Install through-penetration firestop systems to comply with "Performance Requirements" Article and firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce through-penetration firestop systems complying with specified requirements.

END OF SECTION 07841

SECTION 07900 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes sealants for the following applications, including those specified by reference to this Section:

B. This Section includes sealants for the following applications:

1. Exterior joints in the following vertical surfaces and nontraffic horizontal surfaces:

   a. Control and expansion joints in unit masonry.
   b. Joints between different materials listed above.
   c. Perimeter joints between materials listed above and frames of doors and windows.
   d. Other joints as indicated.

2. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:

   a. Control and expansion joints on exposed interior surfaces of exterior walls.
   b. Perimeter joints of exterior openings where indicated.
   c. Tile control and expansion joints.
   d. Vertical control joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
   e. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
   f. Joints between plumbing fixtures and adjoining walls, floors, and counters.
   g. Other joints as indicated.

1.3 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each type and color of joint sealant required. Install joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials in compliance with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: 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.
2. When joint substrates are wet.

B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products specified in the sealant schedule at the end of Part 3.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range for this characteristic.

2.3 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealant Standard: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant in the Elastomeric Joint-Sealant Schedule at the end of Part 3, including those referencing ASTM C 920 classifications for type, grade, class, and uses.

2.4 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

1. Type C: Closed-cell material with a surface skin.

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.

D. 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 where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants with joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces include the following:

    a. Concrete.
    b. Masonry.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

    a. Metal.
    b. Glass.
    c. Porcelain enamel.
    d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended in writing by joint sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and back of joints.

E. Install sealants by proven techniques to 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 provided for 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 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 sealants from surfaces adjacent to joint.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint configuration, per Figure 5B in ASTM C 1193, where indicated.
5. Provide recessed joint configuration, per Figure 5C in ASTM C 1193, of recess depth and at locations indicated.

a. Use masking tape to protect adjacent surfaces of recessed tooled joints.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

3.6 ELASTOMERIC JOINT-SEALANT SCHEDULE

A. Medium-Modulus Neutral-Curing Silicone Sealant: Where joint sealants of this type are indicated, provide products complying with the following:

1. Products: Provide one of the following:

a. 795; Dow Corning.
b. Spectrem 2; Tremco.

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

a. Use O Joint Substrates: color anodic aluminum, aluminum coated with a high-performance coating, galvanized steel, brick, granite, limestone, marble, ceramic tile, and wood.

6. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.

B. Single Component Urethane Sealant: Where joint sealants of this type are indicated, provide products complying with the following:

a. NP-1, Sonneborn
b. Vulkem, Tremco

Provide urethane sealant at all interior masonry control joints and all joints in precast walls, both inside the cavity and exposed on inside of building.

END OF SECTION 07900

SECTION 08111 - STANDARD STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following products manufactured in accordance with SDI Recommended Standards:

1. Doors: Flush, hollow or composite construction standard steel doors for interior and exterior locations.

2. Frames: Pressed steel frames for doors, transoms, sidelights, mullions, interior glazed panels, and other interior and exterior openings of following type:

a. Welded unit type.

3. Assemblies: Provide standard steel door and frame assemblies as required for the following:

a. Labeled and fire rated.

4. Provide factory primed doors and frames to be field painted.

B. Painting primed doors and frames is specified in Division 9 Section "Painting."

C. Door hardware is specified in another Division 8 Section.

D. Glass and Glazing are specified in another Division 8 Section.

1.3 SUBMITTALS

A. Product data for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.

B. Shop drawings showing fabrication and installation of standard steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.

1. Provide schedule of doors and frames using same reference numbers for details and openings as those on contract drawings.

2. Indicate coordinate of glazing frames and stops with glass and glazing requirements.

C. Label Construction Certification: For door assemblies required to be fire-rated and exceeding limitations of labeled assemblies, submit manufacturer's certification that each door and frame assembly has been constructed to conform to design, materials and construction equivalent to requirements for labeled construction.

1.4 QUALITY ASSURANCE

A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications Standard Steel Doors and Frames" ANSI/SDI-100 and as herein specified.

B. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies whose fire resistance characteristics have been determined per ASTM E 152 and which are labeled and listed by UL, Factory Mutual, Warnock Hersey, or other testing and inspecting organization acceptable to authorities having jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage. Provide additional protection to prevent damage to finish of factory-finished doors and frames.

B. Inspect doors and frames upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work and acceptable to Architect; otherwise, remove and replace damaged items as directed.

C. Store doors and frames at building site under cover. Place units on minimum 4-inches high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inches spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, manufacturers offering standard steel doors and frames which may be incorporated in the work include the following:

1. Standard Steel Doors and Frames:
   a. Amweld Building Products, Inc.
   b. Ceco Corp.
   c. Curries
   d. Kewanee Corp.
   e. Pioneer Industries.
   f. Republic Builders Products.
   g. Steelcraft Manufacturing Co.

2.2 MATERIALS

A. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A 366 and ASTM A 568.

B. Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 526, or drawing quality, ASTM A 642, hot dipped galvanized in accordance with ASTM A 525, with A60 or G60 coating designation, mill phosphatized.

C. Supports and Anchors: Fabricate of not less than 18-gage sheet steel; galvanized where used with galvanized frames.

D. Inserts, Bolts, and Fasteners: Manufacturer's standard units. Where items are to be built into exterior walls, hot-dip galvanize in compliance with ASTM A 153, Class C or D as applicable.

E. Shop Applied Paint: Apply after fabrication.

1. Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints complying with ANSI A224.1, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames."

2.3 DOORS

A. Provide metal doors of SDI grades and models specified below or as indicated on drawings:

1. Interior Doors: ANSI/SDI-100, 18-gage cold-rolled sheet steel faces.

2. Exterior Doors: ANSI/SDI-100, 16-gage cold-rolled sheet steel faces (galvanized).

B. Door Louvers: Provide sightproof stationary louvers for interior doors where indicated, constructed of inverted V-shaped or Y-shaped blades formed of 24-gage cold-rolled steel set into minimum 20-gage steel frame.

2.4 FRAMES

A. Provide metal frames for doors, transoms, sidelights, borrowed lights, and other openings, of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated. Fabricate frames of minimum 16-gage cold-rolled steel (14-gage cold rolled steel – galvanized- for exterior openings).

1. Fabricate frames with mitered, welded corners.

B. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single-door frames and 2 silencers on heads of double-door frames.

C. Plaster Guards: Provide minimum 26-gage steel plaster guards or mortar boxes at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

2.5 FABRICATION

A. Fabricate steel door and frame units to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory- assembled before shipment, to assure proper assembly at project site. Comply with ANSI/SDI-100 requirements.

1. Internal Construction: Manufacturer's standard honeycomb, polyurethane, polystyrene, unitized steel grid, vertical steel stiffeners, or rigid mineral fiber core with internal sound deadener on inside of face sheets where appropriate in accordance with SDI standards.

2. Clearances: Not more than 1/8 inch at jambs and heads except between non-fire-rated pairs of doors not more than 1/4 inch. Not more than 3/4 inch at bottom.

B. Fabricate exposed faces of doors and panels, including stiles and rails of nonflush units, from only cold-rolled steel.

C. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames."

D. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel.

E. Fabricate exterior doors, panels, and frames from galvanized sheet steel in accordance with SDI-112. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16-gage inverted steel channels.

F. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

G. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware in accordance with final Door Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 Series Specifications for door and frame preparation for hardware.

1. For concealed overhead door closers, provide space, cutouts, reinforcing and provisions for fastening in top rail of doors or head of frames, as applicable.

H. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied hardware may be done at project site.

I. Locate hardware as indicated on final shop drawings or, if not indicated, in accordance with "Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames," published by Door and Hardware Institute.

J. Shop Painting: Clean, treat, and paint exposed surfaces of steel door and frame units, including galvanized surfaces.

1. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.

2. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint.

K. Glazing Stops: Minimum 20 gage steel .

1. Provide non-removable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other panels in doors.

2. Provide screw applied removable glazing beads on inside of glass, louvers, and other panels in doors.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install standard steel doors, frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.

B. Placing Frames: Comply with provisions of SDI-105 "Recommended Erection Instructions For Steel Frames," unless otherwise indicated.

1. Place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.

2. In masonry construction, locate 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry

wire anchors and masonry Tee anchors.

3. Install fire-rated frames in accordance with NFPA Standard No. 80.

4. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In closed steel stud partitions, attach wall anchors to studs with screws.

C. Door Installation: Fit hollow metal doors accurately in frames, within clearances specified in ANSI/SDI-100.

1. Install fire-rated doors with clearances as specified in NFPA Standard No. 80.

3.2 ADJUST AND CLEAN

A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

B. Protection Removal: Immediately prior to final inspection, remove protective plastic wrappings from prefinished doors.

C. Final Adjustments: Check and readjust operating hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

END OF SECTION 08111

SECTION 08211 - FLUSH WOOD DOORS

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. Solid-core doors with wood-veneer faces.

1.3 SUBMITTALS

A. Product Data: For each type of door. Include details of core and edge construction and trim for openings.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1. Indicate dimensions and locations of mortises and holes for hardware.
2. Indicate dimensions and locations of cutouts.
3. Indicate requirements for veneer matching.
4. Indicate fire ratings for fire doors.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer.

B. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated."

1. Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.

C. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.

1. Test Pressure: Test at atmospheric pressure.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Package doors individually in plastic bags or cardboard cartons.

C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, have warped (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section, or show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 75-mm) span.

1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
2. Warranty shall be in effect during the following period of time from date of Substantial Completion:

a. Solid-Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Flush Wood Doors:

a. Algoma Hardwoods Inc.
b. Eggers Industries; Architectural Door Division.
c. IPIK Door Company.
d. Mohawk Flush Doors, Inc.
e. Weyerhaeuser Company.
f. Buell Door Company.

2.2 DOOR CONSTRUCTION, GENERAL

A. Doors for Transparent Finish:

1. Grade: Premium, with Grade A faces.
2. Species and Cut: Red oak, plain sliced.
3. Match between Veneer Leaves: Slip match.
4. Assembly of Veneer Leaves on Door Faces: Balance match.

5. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
6. Stiles: Same species as faces or a compatible species.

2.3 SOLID-CORE DOORS

A. Particleboard Cores: Comply with the following requirements:

1. Particleboard: ANSI A208.1, Grade LD-2.
2. Provide doors with glued-block cores instead of particleboard cores at locations where exit devices are indicated.

B. Interior Veneer-Faced Doors:

1. Core: Particleboard.
2. Construction: Five or seven plies with stiles and rails bonded to core, then entire unit abrasive planed before veneering.

C. Fire-Rated Doors:

1. Construction: Construction and core specified above for type of face indicated or manufacturer's standard mineral-core construction as needed to provide fire rating indicated.
2. Blocking: For mineral-core doors, provide composite blocking with improved screw-holding capability approved for use in doors of fire ratings indicated as follows:

   a. 5-inch (125-mm) top-rail blocking.
   b. 5-inch (125-mm) bottom-rail blocking, in doors indicated to have protection plates.
   c. 5-inch (125-mm) midrail blocking, in doors indicated to have armor plates.
   d. 5-inch (125-mm) midrail blocking, in doors indicated to have exit devices.

3. Edge Construction: At hinge stiles, provide manufacturer's standard laminated-edge construction with improved screw-holding capability and split resistance and with outer stile matching face veneer.

4. Pairs: Provide fire-rated pairs with fire-retardant stiles matching face veneer that are labeled and listed for kinds of applications indicated without formed-steel edges and astragals. .

2.4 LOUVERS AND LIGHT FRAMES

A. Metal Frames for Light Openings in Fire Doors: Manufacturer's standard frame formed of 0.0478-inch- (1.2-mm-) thick, cold-rolled steel sheet; factory primed and approved for use in doors of fire rating indicated.

2.5 FABRICATION

A. Fabricate doors in sizes indicated for Project-site fitting.

B. Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of door(s) required.

1. Light Openings: Trim openings with moldings of material and profile indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and installed door frames before hanging doors.

1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
2. Reject doors with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Division 8 Section "Door Hardware."

B. Manufacturer's Written Instructions: Install doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.

1. Install fire-rated doors in corresponding fire-rated frames according to NFPA 80.

C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.

1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold.

   a. Comply with NFPA 80 for fire-rated doors.

2. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
3. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock edge; trim stiles and rails only to extent permitted by labeling agency.

D. Field-Finished Doors: Refer to the following for finishing requirements:

1. Division 9 Section "Painting."

3.3 ADJUSTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08211

SECTION 08331 - 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 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following types of overhead coiling doors:
   1. Counter doors.

   Note: Refer to door schedule and partition types for a list of counter doors located in smoke partitions and provide an automatic closing device connected to smoke detection / fire alarm system as outlined below.

1.3 DEFINITIONS

A. Operation Cycle: One complete cycle of a door begins with the door in the closed position. The door is then moved to the open position and back to the closed position.

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide overhead coiling doors capable of withstanding the effects of gravity loads and the following loads and stresses without evidencing permanent deformation of door components:

   1. Wind Load: Uniform pressure (velocity pressure) of 20 lbf/sq. ft. (960 Pa), acting inward and outward.

B. Operation-Cycle Requirements: Design overhead coiling door components and operator to operate for not less than 20,000 cycles and for 10 cycles per day.

   1. Include tamperproof cycle counter.

1.5 SUBMITTALS

A. Product Data: For each type and size of overhead coiling door and accessory. Include details of construction relative to materials, dimensions of individual components, profiles, and finishes. Provide roughing-in diagrams, operating instructions, and maintenance information. Include the following:

   1. Setting drawings, templates, and installation instructions for built-in or embedded anchor devices.
   2. Summary of forces and loads on walls and jambs.

B. Shop Drawings: For special components and installations not dimensioned or detailed in manufacturer's data sheets.

C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for units with factory-applied finishes.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who is an authorized representative of the overhead coiling door manufacturer for both installation and maintenance of units required for this Project.

B. Source Limitations: Obtain overhead coiling doors through one source from a single manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products by one of the following:

1. Atlas Door Corp.; Div. of Clopay Building Products Co.
2. Cornell Iron Works Inc.
3. McKeon Rolling Steel Door Company, Inc.
4. Raynor Garage Doors.
5. Wayne-Dalton Corp.

2.2 DOOR CURTAIN MATERIALS AND CONSTRUCTION

A. Door Curtain: Fabricate overhead coiling door curtain of interlocking slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of material thickness recommended by door manufacturer for performance, size, and type of door indicated, and as follows:

1. Steel Door Curtain Slats: Structural-quality, cold-rolled galvanized steel sheets complying with ASTM A 653, with G90 (ASTM A 653M, with Z275) zinc coating.
2. Stainless-Steel Door Curtain Slats (at dishwashing room only): Type 300 series, ASTM A 240 (ASTM A 240M) or ASTM A 666.

   a. Provide manufacturer's standard flat-profile slats.
3. Inside Curtain Slat Face: To match material of outside metal curtain slat and as follows:

   a. Stainless-Steel Sheet Thickness: Not less than 0.025 inch (0.65 mm).

B. Service Door Endlocks: Malleable-iron castings 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. Counter Door Endlocks: Manufacturer's standard locks on not less than alternate curtain slats for curtain alignment and resistance against lateral movement.

D. Bottom Bar at Counter Doors: Manufacturer's standard continuous channel or tubular shape, either stainless-steel or aluminum extrusions to suit type of curtain slats.

1. Astragal: Provide a replaceable, adjustable, continuous, compressible gasket of flexible vinyl, rubber, or neoprene, between angles or fitted to shape, as a cushion bumper for interior door.

E. Curtain Jamb Guides at Counter Doors: Fabricate curtain jamb guides of angles, or channels and angles of material and finish to match curtain slats, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Provide continuous integral wear strips to prevent metal-to-metal contact and minimize noise of travel and removable stops on guides to prevent overtravel of curtain.

2.3 HOODS AND ACCESSORIES

A. Hood: Form to entirely enclose coiled curtain and operating mechanism at opening head and act as weatherseal. Contour to suit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Provide closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting projecting beyond wall face. Provide intermediate support brackets as required to prevent sag.

1. Fabricate steel hoods, for steel doors, of not less than 0.028-inch (0.7-mm) thick, hot-dip galvanized steel sheet with G90 (Z275) zinc coating, complying with ASTM A 653 (ASTM A 653M).
2. Fabricate hoods of stainless-steel sheet, Type 300 series, complying with ASTM A 240 (ASTM A 240M) or ASTM A 666, and not less than 0.025-inch (0.65-mm) thick, for stainless-steel doors.
3. Include automatic drop baffle to guard against passage of smoke or flame.
4. Shape: Round.

B. Integral Frame, Hood, and Fascia: Provide welded assemblies of the following sheet metal:
1. Fabricate of not less than 0.0625-inch- (1.6-mm-) thick, stainless-steel sheet, Type 300 series, complying with ASTM A 240 (ASTM A 240M) or ASTM A 666.

C. Integral Sills: Fabricate sills as integral part of frame assembly of same sheet metal, but not less than 0.078 inch (2.0 mm) thick.

D. Smoke Seals: Provide UL-listed and -tested smoke-seal perimeter gaskets.

E. Push/Pull Handles: For push-up-operated or emergency-operated doors, provide galvanized steel lifting handles on each side of door.

1. Provide pull-down straps or pole hooks for doors more than 84 inches (2130 mm) high.

F. Slide Bolt: Fabricate with side locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.

G. Provide automatic-closing device inoperative during normal door operations, with governor unit complying with requirements of NFPA 80, with easily tested and reset release mechanism, and designed to be activated by the following:

1. Governor: Oscillating type.

2. Manufacturer's standard UL-labeled smoke detector and door-holder-release devices.

3. Building fire alarm and detection system and door-holder-release devices.

2.4 COUNTERBALANCING MECHANISM

A. General: Counterbalance doors by means of adjustable-tension steel helical torsion spring, mounted around a steel shaft and contained in a spring barrel connected to door curtain with required barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

B. Counterbalance Barrel: Fabricate spring barrel of 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. (2.5 mm/m) of span under full load.

C. Provide spring balance of 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. Provide cast-steel barrel plugs to secure ends of springs to barrel and shaft.

D. Fabricate torsion rod for counterbalance shaft of cold-rolled steel, sized to hold fixed spring ends and carry torsional load.

E. Brackets: Provide mounting brackets of manufacturer's standard design, either cast-iron or cold-rolled steel plate with bell-mouth guide groove for curtain.

2.5 FINISHES, GENERAL

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.6 STEEL AND GALVANIZED STEEL FINISHES

A. Powder-Coat-Applied Finish: Apply manufacturer's standard powder-coat-applied finish consisting of primer and topcoat(s) according to coating manufacturer's written instructions for cleaning, pretreatment, application, thermosetting, and minimum dry film thickness.

1. Color and Gloss: As selected by Architect from manufacturer's full range of colors and glosses.

2.7 STAINLESS-STEEL FINISHES (for Dishwashing Room Door)

A. General: Remove or blend tool and die marks and stretch lines into finish.

B. Bright, Cold-Rolled, Unpolished Finish: No. 2B finish.

C. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

2.8 MANUAL DOOR OPERATORS

A. Provide manual operators, unless electric door operators are indicated. When not shown, provide chain-hoist operator unit.

B. Push-up Operation: Design counterbalance mechanism so required lift or pull for door operation does not exceed 25 lbf (111 N).

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install door and operating equipment complete with necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment supports according to Shop Drawings, manufacturer's written instructions, and as specified.

1. Install fire-rated doors to comply with NFPA 80.

3.2 ADJUSTING

A. Lubricate bearings and sliding parts; adjust doors to operate easily, free from warp, twist, or distortion for entire perimeter.

3.3 DEMONSTRATION

A. Startup Services: Engage a factory-authorized service representative to perform startup services and to train Owner's maintenance personnel as specified below:

1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

   a. Test door closing when activated by detector or alarm connected fire-release system. Reset door-closing mechanism after successful test.

2. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, preventive maintenance, and procedures for testing and resetting release devices.
3. Review data in the maintenance manuals. Refer to Division 1 Section "Contract Closeout."
4. Review data in the maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."
5. Schedule training with Owner with at least 7 days' advance notice.

END OF SECTION 08331

SECTION 08410 - ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Exterior entrance systems.
2. Interior entrance systems.
3. Exterior storefront systems.
4. Interior storefront systems.

1.3 SYSTEM DESCRIPTION

A. General: Provide aluminum entrance and storefront systems capable of withstanding loads and thermal and structural movement requirements indicated without failure, based on testing manufacturer's standard units in assemblies similar to those indicated for this Project. Failure includes the following:

1. Air infiltration and water penetration exceeding specified limits.
2. Framing members transferring stresses, including those caused by thermal and structural movement, to glazing units.

B. Glazing: Physically and thermally isolate glazing from framing members.

C. Wind Loads: Provide entrance and storefront systems, including anchorage, capable of withstanding wind-load design pressures calculated according to requirements of authorities having jurisdiction or the American Society of Civil Engineers' ASCE 7, "Minimum Design Loads for Buildings and Other Structures," 6.4.2, "Analytical Procedure," whichever are more stringent.

1. Deflection of framing members in a direction normal to wall plane is limited to 1/175 of clear span or 3/4 inch (19 mm), whichever is smaller, unless otherwise indicated.

D. Dead Loads: Provide entrance- and storefront-system members that do not deflect an amount which will reduce glazing bite below 75 percent of design dimension when carrying full dead load.

1. Provide a minimum 1/8-inch (3.18-mm) clearance between members and top of glazing or other fixed part immediately below.
2. Provide a minimum 1/16-inch (1.59-mm) clearance between members and operable windows and doors.

E. Live Loads: Provide entrance and storefront systems, including anchorage, that accommodate the supporting structures' deflection from uniformly distributed and concentrated live loads indicated without failure of materials or permanent deformation.

F. Air Infiltration: Provide entrance and storefront systems with permanent resistance to air leakage through fixed glazing and frame areas of not more than 0.06 cfm/sq. ft. (0.3 L/s/sq. m) of fixed wall area when tested according to ASTM E 283 at a static-air-pressure difference of 1.57 lbf/sq. ft. (75.2 Pa).

G. Water Penetration: Provide entrance and storefront systems that do not evidence water leakage through fixed glazing and frame areas when tested according to ASTM E 331 at minimum differential pressure of 20 percent of inward-acting wind-load design pressure as defined by ASCE 7, "Minimum Design Loads for Buildings and Other Structures," but not less than 6.24 lbf/sq. ft. (299 Pa). Water leakage is defined as follows:

1. Uncontrolled water infiltrating systems or appearing on systems' normally exposed interior surfaces from sources other than condensation. Water controlled by flashing and gutters that is drained back to the exterior and cannot damage adjacent materials or finishes is not water leakage.

H. Thermal Movements: Provide entrance and storefront systems, including anchorage, that accommodate thermal movements of systems and supporting elements resulting from the following maximum change (range) in ambient and surface temperatures without buckling, damaging stresses on glazing, failure of joint sealants, damaging loads on fasteners, failure of doors or other operating units to function properly, and other detrimental effects.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

I. Structural-Support Movement: Provide entrance and storefront systems that accommodate structural movements including, but not limited to, sway and deflection.

J. Average Thermal Conductance: Provide storefront systems with average U-values of not more than 0.63 Btu/sq. ft. x h x deg F (3.57 W/sq. m x K) when tested according to AAMA 1503.1.

K. Dimensional Tolerances: Provide entrance and storefront systems that accommodate dimensional tolerances of building frame and other adjacent construction.

1.4 SUBMITTALS

A. Product Data: For each product specified. Include details of construction relative to materials, dimensions of individual components, profiles, and finishes.

B. Shop Drawings: For entrance and storefront systems. Show details of fabrication and installation, including plans, elevations, sections, details of components, provisions for expansion and contraction, and attachments to other work.

1. For entrance systems, include hardware schedule and indicate operating hardware types, quantities, and locations.

C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for units with factory-applied color finishes.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer to assume engineering responsibility and perform work of this Section who has specialized in installing entrance and storefront systems similar to those required for this Project and who is acceptable to manufacturer.

1. Engineering Responsibility: Prepare data for entrance and storefront systems, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Source Limitations: Obtain each type of entrance and storefront system through one source from a single manufacturer.

C. Product Options: Drawings indicate size, profiles, and dimensional requirements of entrance and storefront systems and are based on the specific systems indicated. Other manufacturers'

systems with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."

1. Do not modify intended aesthetic effect, as judged solely by Architect, except with Architect's approval and only to the extent needed to comply with performance requirements. Where modifications are proposed, submit comprehensive explanatory data to Architect for review.

D. Welding Standards: Comply with applicable provisions of AWS D1.2, "Structural Welding Code--Aluminum."

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.7 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: Submit a written warranty executed by the manufacturer agreeing to repair or replace components of entrance and storefront systems that fail in materials or workmanship within the specified warranty period. Failures include, but are not limited to, the following:

1. Structural failures including, but not limited to, excessive deflection.
2. Failure of system to meet performance requirements.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Failure of operating components to function normally.
5. Water leakage through fixed glazing and frame areas.

C. Warranty Period: 2 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. Exterior Storefront Framing System: Provide storefront and entrance framing systems fabricated from extruded aluminum members of profile indicated on drawings. Storefront and entrance framing members shall be 1-3/4" x 4 1/2" x .080" (minimum extrusion thickness). 4 1/2" depth is typical for all perimeter members of frame; size of intermediate framing members (both horizontal and vertical mullions) shall be the same as the perimeter framing unless noted on the drawings. Include subframes and other reinforcing members of the type indicated. Provide for flush glazing storefront on all sides without projecting stops. Shop-fabricate and preassemble frame components where possible. Provide storefront frame sections without exposed seams.

   a. Kawneer Company, Inc., TriFab VG 450
   b. VistaWall, FG 2000 Series.

2. Interior Storefront Framing System: Provide storefront and entrance framing systems fabricated from extruded aluminum members of profile indicated on drawings. Storefront and entrance framing members shall be 1 3/4" x 4-1/2" x .080" (minimum extrusion thickness). Include subframes and other reinforcing members of the type indicated. Provide for flush glazing storefront on all sides without projecting stops. Shop-fabricate

and preassemble frame components where possible. Provide storefront frame sections without exposed seams.

a. Kawneer Company, Inc., TriFab VG 450
b. VistaWall, FG Series 2000.

2.2 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated, complying with the requirements of standards indicated below.

1. Sheet and Plate: ASTM B 209 (ASTM B 209M).
2. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221 (ASTM B 221M).
3. Extruded Structural Pipe and Tubes: ASTM B 429.
4. Bars, Rods, and Wire: ASTM B 211 (ASTM B 211M).
5. Welding Rods and Bare Electrodes: AWS A5.10.

B. Steel Reinforcement: Complying with ASTM A 36 (ASTM A 36M) for structural shapes, plates, and bars; ASTM A 611 for cold-rolled sheet and strip; or ASTM A 570 (ASTM A 570M) for hot-rolled sheet and strip.

C. Glazing as specified in Division 8 Section "Glazing."

D. Glazing Gaskets: Manufacturer's standard pressure-glazing system of black, resilient glazing gaskets, setting blocks, and shims or spacers, fabricated from an elastomer of type and in hardness recommended by system and gasket manufacturer to comply with system performance requirements. Provide gasket assemblies that have corners sealed with sealant recommended by gasket manufacturer.

E. Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.

F. Sealants and joint fillers for joints at perimeter of entrance and storefront systems as specified in Division 7 Section "Joint Sealants."

G. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements, except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.3 COMPONENTS

A. Doors: Provide manufacturer's <u>heavy wall entrance framing and entrances</u> (Kawneer's 500 Tuffline or equal by Vistawall) with 1-3/4-inch- (44.5-mm-) thick glazed doors, extruded tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deep penetration and fillet welded or that incorporate concealed tie-rods.

1. Glazing Stops and Gaskets: Provide manufacturer's standard snap-on extruded-aluminum glazing stops and preformed gaskets.
2. Stile Design: Wide stile; 5 inches (101.6 mm) wide.

B. Brackets and Reinforcements: Provide manufacturer's standard brackets and reinforcements that are compatible with adjacent materials. Provide nonstaining, nonferrous shims for aligning system components.

C. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Reinforce members as required to retain fastener threads.
2. Do not use exposed fasteners, except for hardware application. For hardware application, use countersunk Phillips flat-head machine screws finished to match framing members or hardware being fastened, unless otherwise indicated.

D. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123 or ASTM A 153 requirements.

E. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing, compatible with adjacent materials, and of type recommended by manufacturer.

F. Weather Stripping: Manufacturer's standard replaceable weather stripping as follows:

1. Compression Weather Stripping: Molded neoprene complying with ASTM D 2000 requirements or molded PVC complying with ASTM D 2287 requirements.
2. Sliding Weather Stripping: Wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing complying with AAMA 701 requirements.

2.4 HARDWARE

A. General: Provide heavy-duty hardware units indicated in sizes, number, and type recommended by manufacturer for entrances indicated. Finish exposed parts to match door finish, unless otherwise indicated.

B. Offset Pivots: Provide manufacturer’s recommended continuous hinge for use with heavy wall entrances and doors.

C. Closers, General: Comply with manufacturer's recommendations for closer size, depending on door size, exposure to weather, and anticipated frequency of use.

1. Closing Cycle: Comply with requirements of authorities having jurisdiction or the Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," whichever are more stringent.
2. Opening Force: Comply with the following maximum opening-force requirements for locations indicated:

a. Exterior Doors: 15 lbf (67 N).
b. Interior Doors: 5 lbf (22.2 N).

D. Surface-Mounted Overhead Closers: ANSI/BHMA A156.4, Grade 1. Provide cover and the following:

1. Mounting: Hinge side.
2. Hold Open: None.
3. Back Check: Adjustable.

E. Door-Mounted Holders: ANSI/BHMA A156.16, Grade 1, flip-up type for mounting on door bottom rail and with rubber shoe.

F. Door Stops: ANSI/BHMA A156.16, Grade 1, floor- or wall-mounted door stop, as appropriate for door location indicated, with integral rubber bumper.

G. Cylinders: As specified in Division 8 Section "Door Hardware."

H. Rim Cylinders: Manufacturer's standard rim cylinders for installation in exit devices complying with ANSI/BHMA A156.5, Grade 1 requirements.

I. Cylinder Guard: Manufacturer's standard hardened-steel security ring with retainer plate for inside stile wall that protects lock cylinder from removal by wrenches, prying, or sawing.

J. Deadlock: Manufacturer's standard mortise deadlock with minimum 1-inch- (25.4-mm-) long throw bolt and complying with ANSI/BHMA A156.5, Grade 1 requirements.

1. Three-Point Locking: Provide top and bottom bolts and mechanism that automatically throws inactive-leaf top bolt into frame head and active-leaf bottom bolt into threshold when deadlock engages inactive leaf and provides one-stage unlocking.

K. Hook-Bolt Locks: Manufacturer's standard mortise hook bolt with 5-ply laminated steel, hook-shaped throw bolt, and complying with ANSI/BHMA A156.5, Grade 1 requirements.

L. Lockset Faceplates: Manufacturer's standard extruded-aluminum faceplate for lock type indicated that lays flush with door stile.

1. Provide radiused faceplate with weather sweep extending full length of lock at meeting stiles of pairs of doors.

M. Flat Face Strikes: Manufacturer's standard stainless-steel, flat face strike with steel mounting plate and black-plastic dustbox.

N. Vertical-Rod Exit Devices: Concealed, vertical-rod exit device complying with UL 305 requirements, with 2-point top and bottom latching that is released by a full-width crash bar or when locked down (dogged) by lock cylinder or retracting screws beneath housing.

O. Rim-Mounted Exit Devices: Rim-type exit device complying with UL 305 requirements and with one-point latching at door-lock stile that is released by a full-width crash bar or when locked down (dogged) by lock cylinder or retracting screws beneath housing.

P. Pull Handles: As selected by Architect from manufacturer's full range of pull handles and plates.

Q. Thresholds: At exterior doors, provide manufacturer's standard threshold with cutouts coordinated for operating hardware, with anchors and jamb clips, and not more than 1/2-inch-(12.7-mm-) high, with beveled edges providing a floor level change with a slope of not more than 1:2, and in the following material:

1. Material: Aluminum, mill finish.

R. Weather Sweeps: Manufacturer's standard weather sweep for application to exterior door bottoms and with concealed fasteners on mounting strips.

2.5 FABRICATION

A. General: Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

1. Fabricate components for screw-spline frame construction.

B. Forming: Form shapes with sharp profiles, straight and free of defects or deformations, before finishing.

C. Prepare components to receive concealed fasteners and anchor and connection devices.

D. Fabricate components to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.

E. Welding: Weld components to comply with referenced AWS standard. Weld before finishing components to greatest extent possible. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

F. Glazing Channels: Provide minimum clearances for thickness and type of glass indicated according to FGMA's "Glazing Manual."

G. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

H. Storefront: Fabricate framing in profiles indicated for flush glazing (without projecting stops). Provide subframes and reinforcing of types indicated or, if not indicated, as required for a complete system. Factory assemble components to greatest extent possible. Disassemble components only as necessary for shipment and installation.

I. Entrances: Fabricate door framing in profiles indicated. Reinforce as required to support imposed loads. Factory assemble door and frame units and factory install hardware to greatest extent possible. Reinforce door and frame units as required for installing hardware indicated. Cut, drill, and tap for factory-installed hardware before finishing components.

1. Exterior Doors: Provide compression weather stripping at fixed stops. At other locations, provide sliding weather stripping retained in adjustable strip mortised into door edge.
2. Interior Doors: Provide ANSI/BHMA A156.16 silencers at stops to prevent metal to metal contact. Provide 3 silencers on strike jamb of single-door frames and 2 silencers on head of double-door frames.

2.6 ALUMINUM FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

D. Class I, Color Anodic Finish: AA-M12C22A42/A44 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 606.1 or AAMA 608.1.

1. Color: As selected by Architect from the full range of industry colors and color densities.

2.7 STEEL PRIMING

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying primer.

B. Surface Preparation: Perform manufacturer's standard cleaning operations to remove dirt, oil, grease, or other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel.

C. Priming: Apply manufacturer's standard corrosion-resistant primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of entrance and storefront systems. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Comply with manufacturer's written instructions for protecting, handling, and installing entrance and storefront systems. Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure nonmovement joints. Seal joints watertight.

B. Metal Protection: Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape recommended by manufacturer for this purpose. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints and condensation and moisture occurring or migrating within the system to the exterior.

D. Set continuous sill members and flashing in a full sealant bed to provide weathertight construction, unless otherwise indicated. Comply with requirements of Division 7 Section "Joint Sealants."

E. Install framing components plumb and true in alignment with established lines and grades without warp or rack of framing members.

F. Install entrances plumb and true in alignment with established lines and grades without warp or rack. Lubricate operating hardware and other moving parts according to hardware manufacturers' written instructions.

1. Install surface-mounted hardware according to manufacturer's written instructions using concealed fasteners to greatest extent possible.

G. Install glazing to comply with requirements of Division 8 Section "Glazing," unless otherwise indicated.

H. Install perimeter sealant to comply with requirements of Division 7 Section "Joint Sealants," unless otherwise indicated.

I. Erection Tolerances: Install entrance and storefront systems to comply with the following maximum tolerances:

1. Variation from Plane: Limit variation from plane or location shown to 1/8 inch in 12 feet (3 mm in 3.7 m); 1/4 inch (6 mm) over total length.
2. Alignment: Where surfaces abut in line, limit offset from true alignment to 1/16 inch (1.5 mm). Where surfaces meet at corners, limit offset from true alignment to 1/32 inch (0.8 mm).
3. Diagonal Measurements: Limit difference between diagonal measurements to 1/8 inch (3 mm).

3.3 ADJUSTING AND CLEANING

A. Adjust doors and hardware to provide tight fit at contact points and weather stripping, smooth operation, and weathertight closure.

B. Remove excess sealant and glazing compounds, and dirt from surfaces.

3.4 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure entrance and storefront systems are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 08410

SECTION 08710 – FINISH HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. Definition: "Finish Hardware" includes items known commercially as finish hardware which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame.

B. Extent of finish hardware required is indicated on drawings and in schedules.

C. Types of finish hardware required include the following:

Hinges
Continuous hinges
Key control system
Lock cylinders and keys
Lock and latch sets
Bolts
Exit devices
Push/pull units
Closers
Overhead holders
Electronic door control devices
Door trim units
Protection plates
Weather-stripping
Astragals
Thresholds

1.3 RELATED SECTIONS

A. Standard Steel Doors and Frames: Section 08110
B. Flush Wood Doors: Section 08211
C. Aluminum Entrances and Storefronts: Section 08410

1.4 QUALITY ASSURANCE

A. Manufacturer: Obtain each type of hardware (i.e. lock sets) from a single manufacturer.

B. Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who has been furnishing hardware in the project's vicinity for a period of not less than 2 years, and who is, or who employs an experienced architectural hardware consultant who is available, at reasonable times during the course of the work, for consultation about project's hardware requirements, to Owner, Architect and Contractor. Supplier is responsible for proper coordination of all finish hardware with related sections to insure compatibility of products.

C. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80 and local building code requirements. Provide only hardware that has been tested and listed

by UL or FM for types and sizes of doors required and complies with requirements of door and doorframe labels.

D. Where emergency exit devices are required on fire-rated doors (with supplementary marking on doors' UL or FM labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide UL or FM label on exit devices indicating "Fire Exit Hardware".

E. Thru Bolts for all Door Closers and Exit Devices installed on wood doors.

1.5 SUBMITTALS

A. Product Data: Submit manufacturers technical product data for each item of hardware in accordance with Division-1 section "Submittals". Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finish.

B. Hardware Schedule: Submit final hardware schedule in manner indicated below. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware.

1. Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
   a. Type, style, function, size and finish of each hardware item.
   b. Name and manufacturer of each item.
   c. Fastenings and other pertinent information.
   d. Location of hardware set cross-referenced to indications on
   e. Drawings both on floor plans and in door and frame schedule.
   f. Explanation of all abbreviations, symbols, codes, etc., contained in schedule.
   g. Mounting locations for hardware.
   h. Door and frame sizes and materials.
   i. Keying information.

C. Submittal Sequence: Submit schedule at earliest possible date particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames), which is critical in the project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.

D. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

E. Samples if Requested: Prior to submittal of the final hardware schedule and prior to final ordering of finish hardware, submit one sample of each type of exposed hardware unit, finished as required, and tagged with full description for coordination with schedule.

F. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of such other work, to confirm that adequate provisions are made for proper location and installation of hardware.

1.6 PRODUCT 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. Inventory hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.

C. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.

D. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.

PART 2 PRODUCTS

2.1 SCHEDULED HARDWARE

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware is indicated in the Finish Hardware Data Sheet and Hardware Schedule at the end of this section. Products are identified by using hardware designation numbers of the following.

B. Manufacturer's Product Designations:

Hinges:	Stanley	(Sta)
Continuous Hinges:	Select Products	(Sel)
Locksets:	Schlage	(Sch)
Silencers:	Glynn-Johnson	(G-J)
Floor/Wall Stops:	Ives	(Ive)
Overhead Stops:	Glynn-Johnson	(G-J)
Overhead Holders:	LCN	(LCN)
Kickplates:	Ives	(Ive)
Closers:	LCN	(LCN)
Thresholds:	Reese Enterprises	(Rse)
Weather-stripping:	Reese Enterprises	(Rse)
Push Bars:	Von Duprin	(Von)
Pulls:	Von Duprin,	(Von)
Push/Pull Plates	Ives	(Ive)
Exit Devices:	Von Duprin	(Von)
Flush Bolts:	Glynn-Johnson	(G-J)
Mag Locks/Key Switch	Locknetics	(Loc)
Power Supply	Locknetics	(Loc)
Miscellaneous Hardware:	Glynn-Johnson, Ives, Stanley	
Key Cabinet:	Telkee	

2.2 MATERIALS AND FABRICATION

A. General:

1. Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
2. Manufacturer's Name Plate: Do not use manufacturer's products which have manufacturer's name or trade name displayed in a visible location (omit removable nameplates), except in conjunction with required UL labels and as otherwise acceptable to Architect.
3. Manufacturer's identification will be permitted on rim of lock cylinders only.
4. Finish: Hardware finish shall match US26D unless otherwise indicated. Closer bodies, covers and arms shall be powder coated finish to match AL.
5. Lockset Design: Lever handle design shall be similar to 93 as manufactured by SCHLAGE.
6. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
7. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match

hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.

8. Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex screw fasteners.
9. Tools and Maintenance Instructions for Maintenance: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware.

2.3 HINGES, BUTTS AND PIVOTS

A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

B. Screws: Furnish Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.

C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
1. Steel Hinges: Steel pins.
2. Non-ferrous Hinges: Stainless steel pins.
3. Exterior Doors: Non-removable pins.
4. Out-swing Corridor Doors: Non-removable pins.
5. Interior Doors: Non-rising pins.
6. Tips: Flat button and matching plug, finished to match leaves.
7. Number of hinges: Provide number of hinges indicated but not less than 3 hinges for door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.
8. Hinge Size: Minimum Pin height for 1-3/8” thick doors shall be 4”; for 1-3/4” doors up to 36” wide height shall be 4-1/2”; doors 37” to 48” wide shall be 5” high. The width of the hinges shall be determined by trim condition.

D. Acceptable Manufacturers:
1. Stanley
2. McKinney
3. Hager

2.4 CONTINUOUS HINGES

A. Hinge shall be a pinless assembly of three interlocking extrusions applied to the full height of the door and frame without mortising. The door leaf and jamb leaf shall be geared together for the entire length of the hinge and joined by a channel. Hinge knuckle shall be monolithic in appearance. Continuous hinge with visible knuckle separations are not acceptable. Vertical door loads shall be carried on minimum 3/4" acetal bearings through a full 180 degrees. The door leaf and jamb leaf shall have templated screw hole locations for future replacement needs. All heavy-duty hinges (HD) shall have a minimum of 32 (½”) tall bearings for a 7' length.

B. Acceptable Manufacturers:
1. Select
2. Roton

2.5 LOCK CYLINDERS AND KEYING

A. General: Supplier will meet with Owner to finalize keying requirements and obtain final instructions in writing.

B. Review the keying system with the Owner and provide the type required (master, grandmaster or great-grandmaster), either new or integrated with Owner's existing system.

C. All Locks to be Interchangeable – core pin tumbler inserts keyed to the Existing Schlage Everest D Key System for East Baton Rouge Parish.

D. Furnish only temporary inserts for the construction period, and remove these when directed.

E. Manufacturer: Subject to compliance with requirements, provide lockset of products of the following.

1. Schlage L9000 x 93N Trim x Everest D Interchangeable Core
2. Sargent 8200 x LW1J Trim x Schlage Everest D Interchangeable Core

F. Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.

G. Comply with Owner's instructions for masterkeying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.

H. Permanently inscribe each key with number or lock that identifies cylinder manufacturer key symbol, and notation "DO NOT DUPLICATE".

I. Key Material: Provide keys of nickel silver only.

J. Key Quantity: Furnish 3 change keys for each lock; 5 master keys for each master system; and 5 grandmaster keys for each grandmaster system, 3 Control Keys for System. Furnish 10 Construction Keys and 2 Construction Control Keys.

K. Furnish one extra blank for each lock.

L. Deliver keys to Owner's representative.

M. Lock Functions as follows:
Locks are to be keyed to the existing Schlage Everest D Key System.

Schlage	Sargent
L9050R Everest	8205
L9040	8265
L9080R Everest	8204
L9010	8215
L9071R Everest	8238
L9070R Everest	8237
L9453R Everest	8243
L463R Everest	4877
Cylinder 26-091	
Cylinder 20-057	

2.6 LOCKS, LATCHES AND BOLTS

A. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set.

B. Provide dust-proof strikes for foot bolts, except where special threshold construction provides non-recessed strike for bolt.

C. Provide roller type strikes where recommended by manufacturer of the latch and lock units.

D. Lock Throw: Provide 5/8" minimum throw of latch and deadbolt used on pairs of doors. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.

E. Provide 1/2" minimum throw on other latch and deadlock bolts.

F. Locks shall meet these certifications: ANSI A156.13 1987 Grade 1 Operational, Grade 3 Security, ANSI/ASTM F476-76 Grade 20.

G. Flush Bolt Heads: Minimum of 1/2" diameter rods of brass, bronze or stainless steel, with minimum 12" long rod for doors up to 7'-0" in height. Provide longer rods as necessary for doors exceeding 7'-0" in height.

H. Exit Device Dogging: Except on fire-rated doors, wherever closers are provided on doors equipped with exit devices, equip the units with keyed dogging device to hold the push bar down and the latch bolt in the open position.

2.7 CLOSERS AND DOOR CONTROL DEVICES

A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.

B. Closers: All door closers shall be of one manufacturer to provide for proper installation and servicing after installation. All closers shall be inspected after installation by a factory representative to ensure proper adjustment and operation. A report shall be filed with the architect after said visit has been made. Closer shall carry a manufacturer's TEN YEAR WARRANTY for hydraulic units and a TWO YEAR WARRANTY for Electrical and/or power assist units against manufacturing defects and workmanship.

C. All door closers shall be tested to ANSI/BHMA A156.4 test requirements by a BHMA certified testing facility. ALL EXTERIOR DOOR CLOSERS TO HAVE A WRITTEN CERTIFICATION SHOWING SUCCESSFUL COMPLETION OF A MINIMUM OF 10,000,000 CYCLES.

D. All closer cylinders shall be fully hydraulic rack and pinion action with high strength cast iron bodies and one piece forged steel pistons. Closer shall incorporate tamper-proof non-critical screw valves. Closers shall have separate adjustments for latch speed, general speed and hydraulic backcheck. Pressure Relief valves (PRV) are not acceptable.

E. All door closers shall pass the UL10C positive pressure fire test.

F. All closers to have a powder coat finish on closer body, arm, cover and adapter plates. Powder coat finish shall have passed a 100 hour salt spray test.

G. Door closers to have hydraulic fluid that is capable of withstanding temperatures from 120 degrees F – to– 30 degrees F without seasonal adjustment of closer speed.

H. Combination Door Closers and Holders: Provide units designed to hold door in open position under Normal usage and to release and automatically close door under fire conditions. Closers shall have two separately adjustable non-critical closing speed valves plus adjustable back check and adjustable spring power as standard equipment. Single pint hold-open shall take place between 85 and 130 degrees as required.

I. Furnish stick-on templates for all door closers.

J. Provide all drop plates, shoe supports, templates, etc. to properly install closers according to manufacturers recommendations.

K. Subject to compliance with above requirements, provide products of the following:

LCN	SARGENT
4041	351-0
4041-Cush	351-PS
1371/1371-PA	1431/1431PA

2.8 EXIT DEVICES

A. General: All devices and mullions shall be of one manufacturer to provide for proper installation and servicing. Devices shall be furnished non-handed and capable of direct field conversion for all available trim functions. All devices shall carry a three year warranty against manufacturing defects and workmanship.

B. STOREFRONT EXIT DEVICES: Shall be tested to ANSI 156.3 Grade 1.

1. Exit device shall be for narrow stile doors with extruded aluminum mechanism cases with push through type touch pad design with straight or horizontal motion to eliminate pinch points.
2. All internal components to be zinc dichromate coated to prevent rusting.
3. Latch Bolt to be self-Lubricating (Moly-coated) to allow free sliding of latch bolt over strike.
4. Quiet Feature: Device shall have a fluid dampener that decelerates the push pad on its return stroke to reduce noise.
5. Outside Trim: Offset pulls to be thru-bolted to Device.
6. Exit devices to have cylinder dogging.
7. Acceptable Products as Follows:

VON DUPRIN	SARGENT
CD35NL-OP x 392-6	16-19-8504 x 802

C. EXIT DEVICES FOR ALL OTHER OPENINGS: Shall be push through type touch pad design with straight or horizontal motion to eliminate pinch points.

1. Outside Trim: Shall be heavy duty type and fastened by means of concealed welded lugs and thru-bolts from the inside. Lever trim shall be forged brass with a minimum average thickness on the escutcheon of (.130). Offset pulls to be thru-bolted to device.

2. All devices shall be tested to ANSI/BHMA A156.3 test requirements by a BHMA certified testing laboratory. A written certification showing successful completion of a minimum of 1,000,000 cycles is to be provided.

3. All devices that are not fire labeled are to be equipped with cylinder dogging.

4. All exit devices to have zinc dichromate coated internal parts to prevent rusting. All latch bolts to be self-lubricating (Moly-coated) to allow for free sliding of latch bolt over strike. Plated latch bolts are not accepted.

5. Furnish Roller strikes with all devices.

6. Furnish strike similar to 385A by Von Duprin for all interior vertical rod devices having floor strikes.

7. Furnish deadlocking latch bolts with all exit devices.

8. Furnish cylinder with all key removable mullions, lockable exit devices and cylinder dogging.

9. Quite Feature: All devices shall have a fluid dampener that decelerates the push pad on its return stroke and reduces noise.

10. Touch Pad: Shall be Architectural metal. Plastic is not acceptable.

11. Furnish Metal End Caps

12. Furnish required filler plates and shim kits for flush mounting of exit devices on all doors.

13. Furnish the owner a complete maintenance kit, similar to Von Duprin #050046, containing extra springs, link pins, retaining clips, etc.

14. Acceptable products as follows:

VON DUPRIN	SARGENT
98L-F x 03 Lever	12-19-8813 x ETJ
9827L-F x 03 Lever x LBR	12-19-PP8713 x 713-8 ETJ x 12-19-PR8713 x 713-8 ETJ
CD98NL-OP x 392-7	16-19-8804 x 822
9827L-F x 03 Lever	12-19-8713 x ETJ

2.9 FLOOR AND WALL STOPS

A. All floor stops to be field verified for locations.

B. Acceptable Manufacturer
   1. Ives
   2. Glynn Johnson
   3. Rockwood

2.10 DOOR TRIM UNITS

A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units); either machine screws or self-tapping screws.

B. Fabricate edge trim of stainless steel, not more than 1/2" nor less than 1/16" smaller in length than door dimension.

C. Fabricate protection plates (armor, kick or mop) not more than 1-1/2" less than door width on stop side and not more than 1/2" less than door width on pull side, x the height indicated.

D. Metal Plates: Stainless steel, .050" (U.S. 18 ga.).

E. Acceptable Manufacturers

   1. Ives
   2. Rockwood

2.11 WEATHERSTRIPPING

A. General: Except as otherwise indicated, provide continuous weatherstripping at each edge of every exterior door leaf. Provide type, sizes and profiles shown or scheduled. Provide stainless steel sheet metal screw fasteners, color to match the retainer of the gasketing material.

B. Acceptable Manufacturers:
   1. Reese
   2. National Guard

2.12 THRESHOLDS

A. General: Except as otherwise indicated provide standard aluminum threshold unit of type, size and profile as shown or scheduled.

B. Acceptable Manufacturers:
   1. Reese
   2. National Guard

2.13 DOOR SILENCERS

A. All hollow metal frames shall have gray resilient type silencers. Quantity (3) on single doors and quantity (4) on pair of doors.

2.14 KEY CABINET

A. Telkee WC Series with key load record system, preindexed by Hardware Supplier or cylinder manufacturer representative who shall instruct Owner in usage and maintenance of key records. Accommodate all keys under this Contract, plus 100% future expansion.

B. Acceptable Manufacturers:
   1. Telkee
   2. Lund

2.15 HARDWARE SCHEDULE

HW 1

Each to Have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Classroom Lock L9070R x 93N	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
1 ea.	Floor Stop 436B	US26D	(Ive)
3 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 2

Each to Have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Security Classroom Lock L9071R x 93N	US26D	(Sch)
2 ea.	Core 23-030 x Everest D	US26D	(Sch)
1 ea.	Wall Stop 407-1/2S	US32D	(Ive)
1 ea.	Door Closer 1371-REG/1371-PA x TB	Alum	(LCN)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
3 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 3

Each to Have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Storeroom Lock L9080R x 93N	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
1 ea.	Floor Stop 436B	US26D	(Ive)
1 ea.	Door Closer 1371-REG/1371-PA x TB	Alum	(LCN)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
3 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 4

Each to Have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Entrance Lock L9453R x 93N	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
1 ea.	Door Stop 436B	US26D	(Ive)
1 ea.	Door Closer 1371-REG/1371-PA x TB	Alum	(LCN)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
3 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 5

Each to Have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Privacy L9040 x 93N	US26D	(Sch)
1 ea.	Door Stop 436B	US26D	(Ive)
1 ea.	Door Closer 1371-REG/1371-PA x TB	Alum	(LCN)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
3 ea.	Door Mute GJ-64	Gray	(G-J)

HW 6

Each to Have

2 ea.	Continuous Hinge SL11-HD	Clear Alum	(Sel)
2 ea.	Exit Device CD98NL-OP x 392-7	US26D	(Von)
2 ea.	Rim Cylinder 20-057 x ICX	US26D	(Sch)
2 ea.	Mortise Cylinder 26-091 x ICX	US26D	(Sch)
5 ea.	Core 23-030 x Everest D	US26D	(Sch)
2 ea.	Door Closer 4041H-Cush	Alum	(LCN)
1 ea.	Kick Plates 10” x 2” LDW	US32D	(Ive)
1 ea.	Keyed Removable Mullion KR4954	SP28	(Von)
1 ea.	Threshold S483AV	Alum	(Rse)
1 set	Weatherstripping 183C	Alum	(Rse)

HW 7

Each to Have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Office Lock L9050R x 93N	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
1 ea.	Wall Stop 407-1/2S	US32D	(Ive)
3 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 8

Each to Have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Privacy L9040 x 93N	US26D	(Sch)
1 ea.	Wall Stop 407-1/2S	US32D	(Ive)
3 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 9

Each to Have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Office Lock L9050R x 93N	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
1 ea.	Wall Stop 407-1/2S	US32D	(Ive)
1 ea.	Door Closer 1371 x TB	Alum	(LCN)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
3 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 10

Each to Have

3 ea.	Hinges FBB191	US32D	(Sta)
1 ea.	Floor Stop 436B	US26D	(Ive)
1 ea.	Door Closer 4041-REG/4041-EDA x TB	Alum	(LCN)
1 ea.	Push Plate 8200 4 x 16	US32D	(Ive)
1 ea.	Pull Plate 8302-0 4 x 16	US32D	(Ive)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
3 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 11

Each to Have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Passage L9010 x 93N	US26D	(Sch)
1 ea.	Floor Stop 436B	US26D	(Ive)
3 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 12

Each to Have

6 ea.	Hinges FBB179	US26D	(Sta)
2 ea.	Exit Device CD9827L x 03 Lever x LBR	US26D	(Von)
2 ea.	Rim Cylinder 20-057 x ICX	US26D	(Sch)
2 ea.	Mortise Cylinder 26-091 x ICX	US26D	(Sch)
2 ea.	Core 23-030 x Everest D	US26D	(Sch)
2 ea.	Door Stop FS441	US26D	(Ive)
2 ea.	Door Closer 4041-HEDA x TB	Alum	(LCN)
2 ea.	Kick Plate 10” x 1” LDW	US32D	(Ive)
4 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 13

Each to Have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Deadlock L460R	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
1 ea.	Door Stop 436B	US26D	(Ive)
1 ea.	Door Closer 4041-EDA	Alum	(LCN)
1 ea.	Push Plate 8200 4 x 16	US32D	(Ive)
1 ea.	Pull Plate 8302-0 4 x 16	US32D	(Ive)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
3 ea.	Door Mutes GJ-64	Gray	(G-J)

NOTE: PUSH AND PULL PLATES CUT FOR CYLINDER/THUMBTURN AS NEEDED.

HW 14

Each to Have

2 ea.	Continuous Hinges SL11-HD	Clear Alum	(Sel)
2 ea.	Exit Device 9827L-F x 03 Lever	US26D	(Von)
2 ea.	Rim Cylinder 20-057 x ICX	US26D	(Sch)
2 ea.	Core 23-030 x Everest D	US26D	(Sch)
2 ea.	Door Closers 4041-Cush	Alum	(LCN)
2 ea.	Kick Plates 10” x 1” LDW	US32D	(Ive)
4 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 15

Each to Have

6 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Storeroom Lock L9070R x 93N	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
2 ea.	Flush Bolts 458B	US26D	(Ive)
1 ea.	Dust Proof Strike 487B x 489B	US26D	(Ive)
2 ea.	Floor Stops 436B	US26D	(Ive)
1 set	Gasketing DS69C	Alum	(Rse)
1 ea.	Astragal 93C	Alum	(Rse)

HW 16

Each to Have

1ea.	Cylinder as required	US26D	(Sch)
1ea.	Core 23-030 x Everest D	US26D	(Sch)

BALANCE OF HARDWARE BY DOOR SUPPLIER

HW 17

Each to Have

2 ea.	Continuous Hinge SL11-HD	Clear Alum	(Sel)
1 ea.	Entrance Lock L9453R x 93N	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
2 ea.	Flush Bolts 458B	US26D	(Ive)
1 ea.	Overhead Holder PAH60	Alum	(LCN)
1 ea.	Door Closer 4041H-Cush (Active Leaf)	Alum	(LCN)
2 ea.	Kick Plates 16” x 1” LDW	US32D	(Ive)
1 ea.	Threshold S483AV	Alum	(Rse)
1 set	Weatherstripping 807C	Alum	(Rse)
1 ea.	Astragal 183C	Alum	(Rse)

HW 18

Each to Have

6 ea.	Hinges FBB191 NRP	US32D	(Sta)
1 ea.	Storeroom Lock L9080R x 93N	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
2 ea.	Flush Bolts 458B	US26D	(Ive)
1 ea.	Overhead Holder PAH60	Alum	(LCN)
1 ea.	Door Closer 4041H-Cush (Active Leaf)	Alum	(LCN)
2 ea.	Kick Plates 10” x 1” LDW	US32D	(Ive)
1 ea.	Threshold S483AV	Alum	(Rse)
1 set	Weatherstripping 807C	Alum	(Rse)
1 ea.	Astragal 183C	Alum	(Rse)

HW 19

Each to Have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Classroom Lock L9070R x 93N	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
1 ea.	Floor Stop 436B	US26D	(Ive)
1 set	Gasketing DS69C	Alum	(Rse)

HW 20
Each to Have

3 ea.	Hinges FBB191 NRP	US32D	(Sta)
1 ea.	Classroom Lock L9071R x 93N	US26D	(Sch)
2 ea.	Cores 23-030 x Everest D	US26D	(Sch)
1 ea.	Door Closer 4041H-Cush	Alum	(LCN)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
1 ea.	Threshold S483AV	Alum	(Rse)
1 set	Weatherstripping 807C	Alum	(Rse)

HW 21

Each to Have

1 ea.	Continuous Hinge SL11-HD	Alum	(Sel)
1 ea.	Exit Device CD98NL-OP x 392-&	US26D	(Von)
1 ea.	Rim Cylinder 20-057 x ICX	US26D	(Sch)
1 ea.	Mortise Cylinder 26-091 x ICX	US26D	(Sch)
2 ea.	Cores 23-030 - Everest D	US26D	(Sch)
1 ea.	Door Closer 4041-Cush	Alum	(LCN)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
1 ea.	Threshold S483AV	Alum	(Rse)
1 set	Weatherstripping 807C	Alum	(Rse)

HW 22

Each to Have

1 ea.	Exit Device CD35NL-OP x 392-6	US26D	(Von)
1 ea.	Exit Device CD35DT x 392-6	US26D	(Von)
1 ea.	Rim Cylinder 20-057 x ICX	US26D	(Sch)
2 ea.	Mortise Cylinder 26-091 x ICX	US26D	(Sch)
3 ea.	Core 23-030 x Everest D	US26D	(Sch)
2 ea.	Door Closer 4041-Cush x Bkts. Required	Alum	(LCN)
1 ea.	Removable Mullion 5754	SP28	(Von)

HINGES BY DOOR SUPPLIER

HW 23

Each to Have

1 ea.	Dummy Push Bar 350 x Pull 392-6	US26D	(Von)
1 ea.	Door Closer 4041-Cush x Bkts. Required	Alum	(LCN)

HINGES BY DOOR SUPPLIER

HW 24

Each to Have

2 ea.	Dummy Push Bar 350 x Pull 392-6	US26D	(Von)
2 ea.	Door Closer 4041-Cush x Bkts. Required	Alum	(LCN)

HINGES BY DOOR SUPPLIER

HW 25

Each to Have

6 ea.	Hinges FBB179	US26D	(Sta)
2 ea.	Exit Devices 9827EO-F x LBR	US26D	(Von)
2 ea.	Door Closer 4041-T (Push Side) x TB	Alum	(LCN)
2 ea.	Wall Magnets SEM7840	Alum	(LCN)
2 ea.	Kick Plates 10” x 1” LDW	US32D	(Ive)
4 ea.	Door Mutes GJ-64	Gray	(G-J)

NOTE: ELECTRICAL CONNECTION REQUIRED

HW 25A

Each to Have

6 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Classroom Lock L9070R x 93N	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
2 ea.	Flush Bolts 458B	US26D	(Ive)
1 ea.	Dust Proof Strike 487B x 489B	US26D	(Ive)
2 ea.	Floor Stops 436B	US26D	(Ive)
1 ea.	Door Closer 4041 x TB	Alum	(LCN)
2 ea.	Kick Plates 10” x 1” LDW	US32D	(Ive)
4 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 26

Each to Have

6 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Storeroom Lock L9080R x 93N	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
2 ea.	Flush Bolts 458B	US26D	(Ive)
1 ea.	Dust Proof Strike 487B x 489B	US26D	(Ive)
2 ea.	Door Stops 407-1/2 or 436B as required	US26D	(Ive)
4 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 27

Each to Have

3 ea.	Hinges FBB191	US32D	(Sta)
1 ea.	Classroom Deadlock L463R	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
1 ea.	Door Stop 436B	US26D	(Ive)
1 ea.	Door Closer 4041-EDA	Alum	(LCN)
1 ea.	Push Plate 8200 4 x 16	US32D	(Ive)
1 ea.	Pull Plate 8302-0 4 x 16	US32D	(Ive)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
3 ea.	Door Mutes GJ-64	Gray	(G-J)

NOTE: PUSH AND PULL PLATES CUT FOR CYLINDER/THUMBTURN AS NEEDED.

HW 28

Each to Have

1 ea.	Continuous Hinge SL11-HD	Clear Alum	(Sel)
1 ea.	Exit Device 98L-F x 03 Lever	US26D	(Von)
1 ea.	Rim Cylinder 20-057 x ICX	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
1 ea.	Door Stop 436B	US26D	(Ive)
1 ea.	Door Closer 4041-EDA	Alum	(LCN)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
3 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 29

Each to Have

2 ea.	Continuous Hinges SL11-HD	Clear Alum	(Sel)
2 ea.	Exit Devices 9827L-F x 03 Lever	US26D	(Von)
2 ea.	Rim Cylinders 20-057 x ICX	US26D	(Sch)
2 ea.	Cores 23-030 x Everest D	US26D	(Sch)
2 ea.	Door Closer 4041-EDA	Alum	(LCN)
2 ea.	Wall Magnets SEM7850	Alum	(LCN)
2 ea.	Kick Plate 10” x 1” LDW	US32D	(Ive)
4 ea.	Door Mutes GJ-64	Gray	(G-J)

NOTE: ELECTRICAL CONNECTION REQUIRED

HW 30

Each to Have

6 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Classroom Lock L9070R x 93N	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
1 set	Automatic Flush Bolts FB31P	US26D	(Ive)
1 ea.	Dust Proof Strike 487B x 489B	US26D	(Ive)
2 ea.	Door Closer 4041-REG	Alum	(LCN)
1 ea.	Coordinator COR x FL	US26D	(Ive)
2 ea.	Kick Plates 10” x 1” LDW	US32D	(Ive)
4 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 31

Each to have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Entrance Lock L9453 x 93N	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
1 ea.	Wall Stop 407-1/2S	US32D	(Ive)
1 ea.	Door Closer 1371-REG	Alum	(LCN)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
1 set	Gasketing DS69C	Alum	(Rse)
1 ea.	Automatic Door Bottom 320C	Alum	(Rse)

HW 32

Each to Have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Passage L9010 x 93N	US26D	(Sch)
1 ea.	Wall Stop 407-1/2S	US32D	(Ive)
1 set	Gasketing DS69C	Alum	(Rse)
1 ea.	Automatic Door Bottom 320C	Alum	(Rse)

HW 33

Each to Have

1 ea.	Exit Device CD35NL-OP x 392-6	US26D	(Von)
2 ea.	Exit Device CD35DT x 392-6	US26D	(Von)
1 ea.	Rim Cylinder 20-057 x ICX	US26D	(Sch)
2 ea.	Mortise Cylinders 26-091 x ICX	US26D	(Sch)
3 ea.	Cores 23-030 x Everest D	US26D	(Sch)
2 ea.	Door Closer 4041-Cush x Bkts Required	Alum	(LCN)
1 ea.	Removable Mullion 5754	SP28	(Von)

HINGES, THRESHOLDS AND WEATHERSTRIPPING BY DOOR SUPPLIER

HW 34

Each to Have

1 ea.	Continuous Hinge SL11-HD	Clear Alum	(Sel)
1 ea.	Exit Device CD98NL-OP x 392-7	US26D	(Von)
1 ea.	Rim Cylinder 20-057 x ICX	US26D	(Sch)
1 ea.	Mortise Cylinder 26-091 x ICX	US26D	(Sch)
3 ea.	Cores 23-030 x Everest D	US26D	(Sch)
1 ea.	Door Closer 4041-Cush	Alum	(LCN)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
3 ea.	Door Mutes GJ-64	Grey	(G-J)

HW 35

Each to Have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Alarmed Exit Device 98L x 03 Lever x 98ALK	US26D	(Von)
1 ea.	Rim Cylinder 20-057 x ICX	US26D	(Sch)
1 ea.	Mortise Cylinder 26-091 x ICX	US26D	(Sch)
2 ea.	Cores 23-030 x Everest D	US26D	(Sch)
1 ea.	Door Closer 4041-Cush	Alum	(LCN)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
3 ea.	Door Mutes GJ-64	Grey	(G-J)

HW 36

Each to Have

1 ea.	Continuous Hinge SL11-HD	Clear Alum	(Sel)
1 ea.	Exit Device 98L-F x 03 Lever	US26D	(Von)
1 ea.	Rim Cylinder 20-057 x ICX	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
1 ea.	Door Closer 4041-Cush	Alum	(LCN)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
1 ea.	Threshold S483AV	Alum	(Rse)
1 set	Weatherstripping 807C	Alum	(Rse)

HW 37

Each to Have

3 ea.	Hinges FBB179	US26D	(Sta)
1 ea.	Exit Device 98L x 03 Lever	US26D	(Von)
1 ea.	Rim Cylinder 20-057 x ICX	US26D	(Sch)
1 ea.	Core 23-030 x Everest D	US26D	(Sch)
1 ea.	Wall Stop 407-1/2	US32D	(Ive)
1 ea.	Door Closer 4041-EDA	Alum	(LCN)
1 ea.	Kick Plate 10” x 2” LDW	US32D	(Ive)
3 ea.	Door Mutes GJ-64	Gray	(G-J)

HW 38

Each to Have

2 ea.	Continuous Hinges SL11-HD	Clear Alum	(Sel)
2 ea.	Exit Device 98L-F x 03 Lever	US26D	(Von)
2 ea.	Rim Cylinder 20-057 x ICX	US26D	(Sch)
2 ea.	Mortise Cylinder 26-091 x ICX	US26D	(Sch)
4 ea.	Core 20-030 x Everest D	US26D	(Sch)
2 ea.	Door Closer 4041-EDA	Alum	(LCN)
2 ea.	Kick Plate 10” x 1” LDW	US32D	(Ive)
1 ea.	Keyed Removable Mullion KR9954	SP28	(Von)
2 ea.	Electromagnetic Locks 350+	US28	(Loc)
1 ea.	Key Switch 653-04 (Mount on Pull Side)	US32D	(Loc)
1 ea.	Power Supply 510 x EIR		(Loc)

NOTE: ELECTRICAL CONNECTION REQUIRED. ELECTROMAGNETIC LOCKS TO BE TIED INTO FIRE ALARM SYSTEM. KEY SWITCH TO TURN ON AND OFF THE ELECTROMAGNETIC LOCKS.

PART 3 EXECUTION

3.1 INSTALLATION

A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by Architect.

B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division-9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.

C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

E. A pre-installation meeting between the hardware installer and the manufacturer’s representative shall be held before the installation of the hardware.

F. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant.

3.2 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surfaces soiled by hardware installation.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct Owner’s Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

E. A post hardware installation inspection shall be performed by the manufacturer’s representative to insure that all hardware is installed and working properly.

F. Continued Maintenance Service: Approximately six months after the acceptance of hardware in each area, the Installer, accompanied by the representative of the latch and lock manufacturer, shall return to the project and re-adjust every item of hardware to restore proper function of doors

and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

END OF SECTION 08710

SECTION 08800 - GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:

1. Windows.
2. Doors.
3. Interior borrowed lites.
4. Storefront framing.
5. Curtain wall

1.3 DEFINITIONS

A. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.

B. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1.4 PERFORMANCE REQUIREMENTS

A. General: Provide glazing systems capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Glass Design: Glass thicknesses indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:

1. Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300, according to the following requirements:

a. Specified Design Wind Loads: As indicated.

b. Specified Design Snow Loads: As indicated, but not less than snow loads applicable to Project, required by ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 7, "Snow Loads."

c. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15 degrees off vertical and under wind action.

1) Load Duration: 60 seconds or less.

d. Probability of Breakage for Sloped Glazing: 1 lite per 1000 for lites set more than 15 degrees off vertical and under wind and snow action.

1) Load Duration: 30 days.

e. Maximum Lateral Deflection: For the following types of glass supported on all four edges, provide thickness required that limits center deflection at design wind pressure to 1/50 times the short side length or 1 inch (25 mm), whichever is less.

1) For monolithic-glass lites heat treated to resist wind loads.
2) For laminated-glass lites.

f. Minimum Glass Thickness for Exterior Lites: Not less than 6 mm.

g. Thickness of Tinted and Heat-Absorbing Glass: Provide the same thickness for each tint color indicated throughout Project.

C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:

1. For monolithic-glass lites, properties are based on units with lites 6 mm thick.
2. For laminated-glass lites, properties are based on products of construction indicated.
3. Center-of-Glass U-Values: NFRC 100 methodology using LBL-35298 WINDOW 4.1 computer program, expressed as Btu/ sq. ft. x h x deg F (W/sq. m x K).
4. Center-of-Glass Solar Heat Gain Coefficient: NFRC 200 methodology using LBL-35298 WINDOW 4.1 computer program.
5. Solar Optical Properties: NFRC 300.

1.5 SUBMITTALS

A. Product Data: For each glass product and glazing material indicated.

B. Samples: For the following products, in the form of 12-inch- (300-mm-) square Samples for glass.

1. Each color of tinted float glass.
2. Each type of laminated glass with colored interlayer.

C. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance; and who employs glass installers for this Project who are certified under the National Glass Association Glazier Certification Program as Level 2 (Senior Glaziers) or Level 3 (Master Glaziers).

B. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for Project and whose work has resulted in construction with a record of successful in-service performance.

C. Source Limitations for Clear Glass: Obtain clear float glass from one primary-glass manufacturer.

D. Source Limitations for Tinted Glass: Obtain tinted, heat-absorbing, and light-reducing float glass from one primary-glass manufacturer for each tint color indicated.

E. Source Limitations for Laminated Glass: Obtain laminated-glass units from one manufacturer using the same type of glass lites and interlayers for each type of unit indicated.

F. Source Limitations for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.

G. Safety Glass: Category II materials complying with testing requirements in 16 CFR 1201 and ANSI Z97.1.

1. Subject to compliance with requirements, permanently mark safety glass with certification label of Safety Glazing Certification Council or another certification agency acceptable to authorities having jurisdiction.

H. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: GANA'S "Glazing Manual" and "Laminated Glass Design Guide."
2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR-A7, "Sloped Glazing Guidelines."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1.9 WARRANTY

A. General Warranty: Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Manufacturer's Special Warranty on Laminated Glass: Written warranty, made out to Owner and signed by laminated-glass manufacturer agreeing to furnish replacements for laminated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.

1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products indicated in schedules at the end of Part 3.

2.2 PRIMARY FLOAT GLASS

A. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Quality q3 (glazing select); class as indicated in schedules at the end of Part 3.

2.3 HEAT-TREATED FLOAT GLASS

A. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent glass, flat); Quality q3 (glazing select); class, kind, and condition as indicated in schedules at the end of Part 3.

2.4 LAMINATED GLASS

A. Laminated Glass: Comply with ASTM C 1172 for kinds of laminated glass indicated and other requirements specified, including those in the Laminated-Glass Schedule at the end of Part 3.

B. Interlayer: Interlayer material as indicated below, clear or in colors, and of thickness indicated with a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after laminating glass lites and installation.

1. Interlayer Material: Polyvinyl butyral sheets or cured resin.

C. Laminating Process: Fabricate laminated glass to produce glass free of foreign substances and air or glass pockets as follows:

1. Laminate lites with polyvinyl butyral interlayer in autoclave with heat plus pressure.
2. Laminate lites with laminated glass manufacturer's standard cast-in-place and cured transparent resin interlayer.

2.5 GLAZING GASKETS

A. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal:

1. Neoprene, ASTM C 864.
2. EPDM, ASTM C 864.
3. Silicone, ASTM C 1115.
4. Thermoplastic polyolefin rubber, ASTM C 1115.
5. Any material indicated above.

B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned gaskets of material indicated below; complying with ASTM C 509, Type II, black; and of profile and hardness required to maintain watertight seal:

1. Neoprene.
2. EPDM.
3. Silicone.
4. Thermoplastic polyolefin rubber.
5. Any material indicated above.

2.6 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.

D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

2.7 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

A. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing standard, to comply with system performance requirements.

B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with indoor and outdoor faces.

C. Grind smooth and polish exposed glass edges.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing glazing, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep system.
3. Minimum required face or edge clearances.
4. Effective sealing between joints of glass-framing members.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Glazing channel dimensions, as indicated on Drawings, provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

G. Provide spacers for glass lites where the length plus width is larger than 50 inches (1270 mm) as follows:

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and

glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.

2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.

I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 GASKET GLAZING (DRY)

A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

D. Install gaskets so they protrude past face of glazing stops.

3.5 PROTECTION AND CLEANING

A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.

D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.

E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

3.6 MONOLITHIC FLOAT-GLASS SCHEDULE

A. Uncoated Clear Float Glass: Where glass as designated below is indicated **(interior glazing and in exterior entrance doors and adjacent sidelights),** provide Type I (transparent glass, flat), Class 1 (clear) glass lites complying with the following:

1. ¼" Uncoated Clear Fully Tempered Float Glass : Kind FT (fully tempered).

B. Uncoated Tinted Float Glass **(all 2nd floor exterior glazing):** Where glass as designated below is indicated, provide Class 2 (tinted, heat-absorbing, and light-reducing) glass lites complying with the following:

1. Tint Color: Bronze
2. Visible Light Transmittance: 53%
3. Shading Coefficient: .72
4. Outdoor Visible Reflectance: 5%
5. Solar Factor (SHGC): .62
6. Uncoated Tinted Fully Tempered Float Glass: Condition A (uncoated surfaces), Kind FT (fully tempered).

3.7 LAMINATED-GLASS SCHEDULE

A. Laminated Glass: Where glass of this designation is indicated **(all first floor exterior glazing except entry doors),** provide glass lites complying with the following: Heat-Treated Laminated-Glass Units:

1. Products:

   a. Viracon

   b. Guardian

   c. Arch Aluminum and Glass Co.

2. Kind LHS, consisting of two lites of heat-strengthened float glass.
3. Outer Lite: Class 2 tinted float glass.

   a. Tint Color: Bronze
   b. Kind HS (heat strengthened)
   c. Thickness: 3.0 mm

4. Inner Lite: Class 1 (clear) float glass.

   a. Kind HS (heat strengthened.
   b. Thickness: 3.0 mm

5. Plastic Interlayer:

a. Thickness: 0.060 inch (1.52 mm), but not less than that required to comply as a Type II safety glass material.
b. Interlayer Color: Clear.

6. Shading Coefficient of .70

7. Solar Factor .62

8. Visible light transmittance 53%

9. Note: The contractor shall provide laminated glass on the first floor that matches the visual appearance and thermal performance of the tempered glazing on the second floor.

SECTION 08800

SECTION 08911 - GLAZED ALUMINUM CURTAIN WALLS

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 conventionally glazed aluminum curtain walls installed as stick systems.

B. REFER TO SPECIFICATION SECTION 08410 FOR INFORMATION ON DOORS IN CURTAIN WALL SYSTEMS.

1.3 PERFORMANCE REQUIREMENTS

A. General: Provide glazed aluminum curtain-wall systems, including anchorage, capable of withstanding, without failure, the effects of the following:

1. Structural loads.
2. Movements of supporting structure indicated on Drawings including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
3. Dimensional tolerances of building frame and other adjacent construction.
4. Failure includes the following:

    a. Deflection exceeding specified limits.
    b. Thermal stresses transferred to building structure.
    c. Framing members transferring stresses, including those caused by thermal and structural movements, to glazing.
    d. Noise or vibration created by wind and thermal and structural movements.
    e. Loosening or weakening of fasteners, attachments, and other components.
    f. Sealant failure.

B. Structural Loads:

1. Wind Loads: As indicated on Drawings.

C. Structural-Test Performance: Provide glazed aluminum curtain-wall systems, including anchorage, capable of withstanding test pressure indicated without material and deflection failures and permanent deformation of structural members exceeding 0.2 percent of span when tested according to ASTM E 330.

1. Submit reports of tests performed on manufacturer's standard assemblies.
2. Test Pressure: 150 percent of positive and negative wind-load design pressures.
3. Test Duration: As required by design wind velocity but not less than 10seconds.

D. Deflection of Framing Members:

1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span or 3/4 inch (19 mm), whichever is smaller.
2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch (3.2 mm), whichever is smaller.
3. Cantilever Deflection: Where framing members overhang an anchor point, limited to 2 times the length of cantilevered member, divided by 175.

E. Thermal Movements: Provide glazed aluminum curtain-wall systems that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.
2. Test Performance: No buckling, stress on glass, glazing-edge seal failure, sealant failure, excess stress on curtain-wall framing, anchors and fasteners, or reduction of performance when tested according to AAMA 501.5.

   a. Test Ambient Temperature Range: 0 to 180 deg F (minus 18 to plus 100 deg C)

F. Air Infiltration: Provide glazed aluminum curtain-wall systems with maximum air leakage of 0.06 cfm/sq. ft. (0.03 L/s per sq. m) of fixed wall area when tested according to ASTM E 283 at a minimum static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).

G. Water Penetration Under Static Pressure: Provide aluminum glazed curtain-wall systems that do not evidence water penetration when tested according to ASTM E 331 at a minimum differential static pressure of 20 percent of positive design wind load, but not less than 10 lbf/sq. ft. (479 Pa).

H. Water Penetration Under Dynamic Pressure: Provide glazed aluminum curtain-wall systems that do not evidence water leakage when tested according to AAMA 501.1 under dynamic pressure equal to 20 percent of positive design wind load, but not less than 10 lbf/sq. ft. (479 Pa).

1. Maximum Water Leakage: According to AAMA 501.1. Water controlled by flashing and gutters that is drained to exterior and cannot damage adjacent materials or finishes is not considered water leakage.

I. Average Thermal Conductance: Provide glazed aluminum curtain-wall systems with average U-factor of not more than 0.66 Btu/sq. ft. x h x deg F (3.75 W/sq. m x K) when tested according to AAMA 1503.

1.4 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of product indicated.

B. Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication and assembly of glazed aluminum curtain-wall systems.

1. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

E. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Capable of assuming engineering responsibility and performing Work of this Section and who is acceptable to manufacturer.

1. Engineering Responsibility: Preparation of data for glazed aluminum curtain-wall systems including the following:

a. Shop Drawings based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.

B. Product Options: Information on Drawings and in Specifications establishes requirements for systems' aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.

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.

C. Mockups: Build mockups to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical wall area as shown on Drawings.

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to glazed aluminum curtain-wall systems including, but not limited to, the following:

1. Review structural load limitations.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review required testing, inspecting, and certifying procedures.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual locations of structural supports for glazed aluminum curtain-wall systems by field measurements before fabrication and indicate measurements on Shop Drawings.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating glazed aluminum curtain-wall systems without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.7 WARRANTY

A. Special Assembly Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of glazed aluminum curtain-wall systems that do not comply with requirements or that deteriorate as defined in this Section within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including, but not limited to, excessive deflection.
b. Noise or vibration caused by thermal movements.
c. Deterioration of metals and other materials beyond normal weathering.
d. Water leakage.

2. Warranty Period: Five years from date of Substantial Completion.

B. Special Finish Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components on which finishes fail within specified warranty period. Warranty does not include normal weathering.

1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: The design for glazed aluminum curtain-wall systems is based on Kawneer's 1600 Curtinwall System Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. VistaWall.

2.2 FRAMING SYSTEMS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

1. Sheet and Plate: ASTM B 209 (ASTM B 209M).
2. Extruded Bars, Rods, Shapes, and Tubes: ASTM B 221 (ASTM B 221M).
3. Extruded Structural Pipe and Tubes: ASTM B 429.

B. Steel Reinforcement: With manufacturer's standard corrosion-resistant primer complying with SSPC-PS Guide No. 12.00 applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
2. Cold-Rolled Sheet and Strip: ASTM A 611.
3. Hot-Rolled Sheet and Strip: ASTM A 570/A 570M.

C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

D. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Where fasteners are subject to loosening or turn out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
2. Reinforce members as required to receive fastener threads.
3. At movement joints, use slip-joint linings, spacers, and sleeves of material and type recommended by manufacturer.

E. Anchors: Three-way adjustable anchors that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.

1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A 123/A 123M or ASTM A 153/A 153M requirements.

F. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.

G. Framing Gaskets: As recommended by manufacturer for joint type.

H. Framing Sealants: As specified in Division 7 Section "Joint Sealants."

2.3 GLAZING SYSTEMS

A. Glazing: As specified in Division 8 Section "Glazing."

B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

C. Glazing Sealants: As recommended by manufacturer for joint type.

2.4 ACCESSORY MATERIALS

A. Insulating Materials: Specified in Division 7 Section "Building Insulation."

B. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil (0.762-mm) thickness per coat.

2.5 FABRICATION

A. Form aluminum shapes before finishing.

B. Fabricate components that, when assembled, have the following characteristics:

1. Sharp profiles, straight and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Internal guttering systems or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.
4. Physical and thermal isolation of glazing from framing members.

5. Accommodations for thermal and mechanical movements of glazing and framing to prevent glazing-to-glazing contact and to maintain required glazing edge clearances.
6. Provisions for reglazing from exterior.

C. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.6 ALUMINUM FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

C. Class I, Color Anodic Finish: AA-M12C22A42/A44 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 611.
1. Color: As selected by Architect from full range of industry colors and color densities.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General:

1. Comply with manufacturer's written instructions.
2. Do not install damaged components.
3. Fit joints to produce hairline joints free of burrs and distortion.
4. Rigidly secure nonmovement joints.
5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
6. Seal joints watertight, unless otherwise indicated.

B. Metal Protection:

1. Where aluminum will contact dissimilar metals, protect against galvanic action by painting contact surfaces with primer or by applying sealant or tape or installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum will contact concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

C. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within the system to exterior.

D. Install components plumb and true in alignment with established lines and grades.

E. Install glazing as specified Division 8 Section "Glazing."

F. Install sealants as specified in Division 7 Section "Joint Sealants."

G. Install insulation materials as specified in Division 7 Section "Building Insulation."

H. Erection Tolerances: Install glazed aluminum curtain-wall systems to comply with the following maximum tolerances:

1. Plumb: 1/8 inch in 10 feet (3 mm in 3 m); 1/4 inch in 40 feet (6 mm in 12 m).
2. Level: 1/8 inch in 20 feet (3 mm in 6 m); 1/4 inch in 40 feet (6 mm in 12 m).
3. Alignment:

   a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch (13 mm) wide, limit offset from true alignment to 1/16 inch (1.6 mm).
   b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch (13 to 25 mm) wide, limit offset from true alignment to 1/8 inch (3.2 mm).
   c. Where surfaces are separated by reveal or protruding element of 1 inch (25 mm) wide or greater, limit offset from true alignment to 1/4 inch (6 mm).

4. Location: Limit variation from plane to 1/8 inch in 12 feet (3 mm in 3.7 m); 1/2 inch (12.7 mm) over total length.

END OF SECTION 08911

SECTION 09250 - GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Nonload-bearing steel framing members for gypsum board assemblies.
2. Gypsum board assemblies attached to steel framing.

B. Related Sections: The following Sections contain requirements that relate to this Section:

3. Division 7 Section "Firestopping" for firestopping systems and fire-resistance-rated joint sealants.

1.3 DEFINITIONS

A. Gypsum Board Construction Terminology: Refer to ASTM C 11 and GA-505 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

1.4 ASSEMBLY PERFORMANCE REQUIREMENTS

A. Fire Resistance: Provide gypsum board assemblies with fire-resistance ratings indicated.

1.5 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for each type of product specified.

1.6 QUALITY ASSURANCE

A. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer, unless otherwise indicated.

B. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.

C. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

D. Fire-Test-Response Characteristics: Where fire-resistance-rated gypsum board assemblies are indicated, provide gypsum board assemblies that comply with the following requirements:

1. Fire-Resistance Ratings: As indicated by GA File Numbers in GA-600 "Fire Resistance Design Manual" or design designations in UL "Fire Resistance Directory" or in the listing of

another testing and inspecting agency acceptable to authorities having jurisdiction.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.

1.8 PROJECT CONDITIONS

A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.

B. Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours before application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.

C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. Steel Framing and Furring:

a. Clark Steel Framing, Inc.
b. Dietrich Industries, Inc.
c. Marino/Ware (formerly Marino Industries Corp.).
d. Unimast, Inc.

2. Grid Suspension Assemblies:

a. Armstrong World Industries, Inc.
b. Chicago Metallic Corp.
c. USG Interiors, Inc.
d. Worthington Steel Company (formerly National Rolling Mills).

3. Gypsum Board and Related Products and Gypsum Sheathing:

a. Domtar Gypsum.
b. Georgia-Pacific Corp.
c. National Gypsum Co.; Gold Bond Building Products Division.
d. United States Gypsum Co.

2.2 STEEL FRAMING COMPONENTS FOR SUSPENDED AND FURRED CEILINGS

A. General: Provide components complying with ASTM C 754 for conditions indicated.

B. Wire Ties: ASTM A 641 (ASTM A 641M), Class 1 zinc coating, soft temper, 0.062 inch (1.6 mm) thick.

C. Wire Hangers: ASTM A 641 (ASTM A 641M), Class 1 zinc coating, soft temper, 0.162-inch (4.1-mm) diameter.

D. Angle-Type Hangers: Angles with legs not less than 7/8 inch (22.2 mm) wide, formed from 0.0635-inch- (1.6-mm-) thick galvanized steel sheet complying with ASTM A 653, G 90 (ASTM A 653M, Z 180) coating designation, with bolted connections and 5/16-inch (8-mm) diameter bolts.

E. Channels: Cold-rolled steel, 0.0598-inch (1.5-mm) minimum thickness of base (uncoated) metal and 7/16-inch- (11.1-mm-) wide flanges, and as follows:

1. Carrying Channels: 1-1/2 inches (38.1 mm) deep, 475 lb/1000 feet (70 kg/100 m), unless otherwise indicated.
2. Furring Channels: 3/4 inch (19.1 mm) deep, 300 lb/1000 feet (45 kg/100 m), unless otherwise indicated.
3. Finish: ASTM A 653, G 60 (ASTM A 653M, Z 180) hot-dip galvanized coating for framing for exterior soffits and where indicated.

F. Steel Studs for Furring Channels: ASTM C 645, with flange edges of studs bent back 90 degrees and doubled over to form 3/16-inch- (5-mm-) wide minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:

1. Thickness: 0.0179 inch (0.45 mm), unless otherwise indicated.
2. Depth: 1-5/8 inch (41.3 mm), or 2-1/2 inches (63.5 mm) (as indicated in drawings).
3. Protective Coating: Manufacturer's standard corrosion-resistant coating.

G. Steel Rigid Furring Channels: ASTM C 645, hat shaped, depth of 7/8 inch (22.2 mm), and minimum thickness of base (uncoated) metal as follows:

1. Thickness: 0.0179 inch (0.45 mm), unless otherwise indicated.
2. Protective Coating: Manufacturer's standard corrosion-resistant coating.

H. Steel Resilient Furring Channels: Manufacturer's standard product designed to reduce sound transmission, fabricated from steel sheet complying with ASTM A 653 (ASTM A 653M) or ASTM A 568 (ASTM A 568M) to form ½-inch- (12.7-mm-) deep channel of the following configuration:

1. Single-Leg Configuration: Asymmetric-shaped channel with face connected to a single flange by a single-slotted leg (web).

I. Grid Suspension System for Interior Ceilings: ASTM C 645, manufacturer's standard direct-hung grid suspension system composed of main beams and cross-furring members that interlock to form a modular supporting network.

2.3 STEEL FRAMING FOR WALLS AND PARTITIONS

A. General: Provide steel framing members complying with the following requirements:

1. Protective Coating: ASTM A 653, G 40 (ASTM A 653M, Z 90) hot-dip galvanized coating.

B. Steel Studs and Runners: ASTM C 645, with flange edges of studs bent back 90 degrees and doubled over to form 3/16-inch- (5-mm-) wide minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:

1. Thickness: 0.0329 inch (20 Gage) for head runner, sill runner, jamb, and cripple studs at door

and other openings.
2. Thickness: 0.0329 inch (20 Gage) at interior walls
3. Depth: 3-5/8 inches (92.1 mm) where indicated.
4. Depth: 6 inches (152.4 mm) where indicated.
5. Depth: 4 inches (101.6 mm) where indicated.

C. Steel Rigid Furring Channels: ASTM C 645, hat shaped, depth and minimum thickness of base (uncoated) metal as follows:

1. Thickness: 0.0179 inch (25 Gage), unless otherwise indicated.
2. Depth: 7/8 inch or 1 ½" as indicated on the drawings.

D. Steel Resilient Furring Channels: Manufacturer's standard product designed to reduce sound transmission, fabricated from steel sheet complying with ASTM A 653 (ASTM A 653M) or ASTM A 568 (ASTM A 568M) to form ½-inch- (12.7-mm-) deep channel of the following configuration:

1. Single-Leg Configuration: Asymmetric-shaped channel with face connected to a single flange by a single-slotted leg (web).

E. Z-Furring Members: Manufacturer's standard Z-shaped furring members with slotted or nonslotted web, fabricated from steel sheet complying with ASTM A 653 (ASTM A 653M) or ASTM A 568 (ASTM A 568M); with a minimum base metal (uncoated) thickness of 0.0179 inch (0.45 mm), face flange of 1-1/4 inch (31.8 mm), wall-attachment flange of 7/8 inch (22.2 mm), and of depth required to fit insulation thickness indicated.

F. Steel Channel Bridging: Cold-rolled steel, 0.0598-inch (1.5-mm) minimum thickness of base (uncoated) metal and 7/16-inch- (11.1-mm-) wide flanges, 1-1/2 inches (38.1 mm) deep, 475 lb/1000 feet (45 kg/100 m), unless otherwise indicated.

G. Steel Flat Strap and Backing Plate: Steel sheet for blocking and bracing complying with ASTM A 653 (ASTM A 653M) or ASTM A 568 (ASTM A 568M), length and width as indicated, and with a minimum base metal (uncoated) thickness as follows:

1. Thickness: 0.0179 inch (25 Gage), unless otherwise indicated.

H. Fasteners for Metal Framing: Provide fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members securely to substrates involved; complying with the recommendations of gypsum board manufacturers for applications indicated.

2.5 GYPSUM BOARD PRODUCTS

A. General: Provide gypsum board of types indicated in maximum lengths available that will minimize end-to-end butt joints in each area indicated to receive gypsum board application.

1. Widths: Provide gypsum board in widths of 48 inches (1219 mm).

B. Gypsum Wallboard: <u>All gypsum wallboard on vertical wall surfaces shall be abuse-resistant type:</u> Manufactured to produce greater resistance to surface indentation and through-penetration (impact resistance) than standard, regular-type and Type X gypsum board.

1. Core: 5/8 inch (15.9 mm), Type X for rated and non rated wall assemblies.
2. Long Edges: Tapered.

2. Type: Sag-resistant standard gypsum wallboard complying with ASTM C36 type for ceiling surfaces and vertical furdowns.

C. Gypsum Board Base Layer(s) for Multi layer Applications: Gypsum wallboard, ASTM C 36, and as follows:

1. Type: Type X where indicated or required for fire-resistance-rated assemblies.
2. Edges: Manufacturer's standard.
3. Thickness: 5/8 inch (15.9 mm) where indicated.

D. Water-Resistant Backing Board (Cementitious Backer Units complying with ANSI A108.1.): In restrooms where tile is to be installed on a metal stud partition substrate, subject to compliance with requirements, provide one of the following products :
   a. FinPan, Inc.; Util-A-Crete Concrete Backer Board – 5/8” thick.
   b. USG Corporation; DUROCK Cement Board – 5/8” thick.

2.7 TRIM ACCESSORIES

B. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet or rolled zinc.
2. Shapes:

   a. Cornerbead: Use at outside corners, unless otherwise indicated.
   b. Expansion (Control) Joint: Use where indicated.

C. Aluminum Trim: Extruded accessories of profiles and dimensions indicated on drawings.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Fry Reglet Corp.
   b. Gordon, Inc.
   c. MM Systems Corporation.
   d. Pittcon Industries.

2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), alloy 6063-T5.

3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified

2.8 JOINT TREATMENT MATERIALS

A. General: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.

B. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated.

C. Setting-Type Joint Compounds for Gypsum Board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.

1. Where setting-type joint compounds are indicated as a taping compound only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.

D. Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying

with the following requirements for formulation and intended use.

1. Ready-Mixed Formulation: Factory-mixed product.
2. Job-Mixed Formulation: Powder product for mixing with water at Project site.

2.9 ACOUSTICAL SEALANT

A. Acoustical Sealant for Concealed Joints: Manufacturer's standard nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.

B. Available Products: Subject to compliance with requirements, acoustical sealants that may be incorporated in the Work include, but are not limited to, the following:

1. Acoustical Sealant for Concealed Joints:

a. BA-98; Pecora Corp.
b. Tremco Acoustical Sealant; Tremco, Inc.

2.10 MISCELLANEOUS MATERIALS

A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.

B. Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum panels.

C. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot-grouting hollow metal door frames.

D. Fastening Adhesive for Metal: Special adhesive recommended for laminating gypsum panels to steel framing.

E. Steel drill screws complying with ASTM C 1002 for the following applications:

1. Fastening gypsum board to steel members less than 0.033 inch (0.84 mm) thick.
2. Fastening gypsum board to gypsum board.

F. Steel drill screws complying with ASTM C 954 for fastening gypsum board to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

G. Sound-Attenuation Blankets:

1. Mineral-Fiber Type: Fibers manufactured from glass.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Ceiling Anchorages: Coordinate installation of ceiling suspension systems with installation of overhead structural assemblies to ensure that inserts and other provisions for anchorages to building structure

have been installed to receive ceiling hangers that will develop their full strength and at spacing required to support ceilings.

3.3 INSTALLING STEEL FRAMING, GENERAL

A. Steel Framing Installation Standard: Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installation.

B. Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with recommendations of gypsum board manufacturer or, if none available, with United States Gypsum Co.'s "Gypsum Construction Handbook."

C. Isolate steel framing from building structure at locations indicated to prevent transfer of loading imposed by structural movement. Comply with details shown on Drawings.

D. Do not bridge building control and expansion joints with steel framing or furring members. Independently frame both sides of joints with framing or furring members as indicated.

3.4 INSTALLING STEEL FRAMING FOR SUSPENDED AND FURRED CEILINGS

A. Suspend ceiling hangers from building structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
3. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail.
4. Secure flat, angle, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for structure as well as for type of hanger involved, and in a manner that will not cause them to deteriorate or otherwise fail.
5. Do not support ceilings directly from permanent metal forms. Furnish cast-in-place hanger inserts that extend through forms.
6. Do not attach hangers to steel deck tabs.
7. Do not attach hangers to steel roof deck. Attach hangers to structural members.
8. Do not connect or suspend steel framing from ducts, pipes, or conduit.

B. Install suspended steel framing components in sizes and at spacings indicated, but not less than that required by the referenced steel framing installation standard.

1. Wire Hangers: 48 inches (1219 mm) o.c.
2. Carrying Channels (Main Runners): 48 inches (1219 mm) o.c.
3. Furring Channels (Furring Members): 16 inches (406 mm) o.c.

C. Installation Tolerances: Install steel framing components for suspended ceilings so that cross-furring or grid suspension members are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) as measured both lengthwise on each member and transversely between parallel members.

D. Wire-tie or clip furring members to main runners and to other structural supports as indicated.

E. Grid Suspension System: Attach perimeter wall track or angle where grid suspension system meets vertical surfaces. Mechanically join main beam and cross-furring members to each other and butt-cut to fit into wall track.

3.5 INSTALLING STEEL FRAMING FOR WALLS AND PARTITIONS

A. Install runners (tracks) at floors, ceilings, and structural walls and columns where gypsum board stud assemblies abut other construction.

B. Installation Tolerances: Install each steel framing and furring member so that fastening surfaces do not vary more than 1/8 inch (3 mm) from the plane formed by the faces of adjacent framing.

C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.

1. For STC-rated and fire-resistance-rated partitions that extend to the underside of floor/roof slabs and decks or other continuous solid structural surfaces to obtain ratings, install framing around structural and other members extending below floor/roof slabs and decks, as needed, to support gypsum board closures needed to make partitions continuous from floor to underside of solid structure.

D. Install steel studs and furring in sizes and at spacings indicated.

1. Single-Layer Construction: Space studs 16 inches (406 mm) o.c., unless otherwise indicated.
2. Multi layer Construction: Space studs 24 inches (610 mm) o.c., unless otherwise indicated.

E. Install steel studs so flanges point in the same direction and leading edge or end of each gypsum board panel can be attached to open (unsupported) edges of stud flanges first.

F. For curved partitions, install steel framing as follows:

1. Cut top and bottom runners through leg and web at 2-inch (50-mm) intervals for arc length. In cutting lengths of runners, allow for uncut straight lengths of not less than 12 inches (300 mm) at ends of arcs.
2. Bend runners to uniform curve of radius indicated and locate straight lengths so they are tangent to arcs.
3. Support outside (cut) leg of runners by clinching a 1-inch- (25-mm-) high-by-0.0209-inch- (0.55-mm-) thick steel sheet strip to inside of cut legs using metal lock fasteners.
4. Attach runners to structural elements at floor and ceiling with fasteners located 2 inches (50 mm) from ends and spaced 24 inches (610 mm) o.c.
5. Attach runners to suspended ceilings with toggle bolts or hollow wall anchors located 2 inches (50 mm) from ends and spaced 16 inches (406 mm) o.c. in between where attached to suspended ceilings.

   d. Screw runners directly to suspension grid of suspended acoustical tile ceilings where runners intersect grid.

6. Position studs vertically with open sides facing in same direction and engaging floor and ceiling runners. Begin and end each arc with a stud and space intermediate studs equally along arcs at stud spacing recommended by gypsum board manufacturer for radii indicated. Attach studs to runners with 3/8-inch- (9.5-mm-) long pan head framing screws. On straight lengths at ends of arcs, place studs 6 inches (150 mm) o.c. with last stud left free standing.

G. Frame door openings to comply with GA-219, and with applicable published recommendations of

gypsum board manufacturer, unless otherwise indicated. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

1. Install 2 studs at each jamb, unless otherwise indicated.

H. Frame openings other than door openings to comply with details indicated or, if none indicated, as required for door openings. Install framing below sills of openings to match framing required above door heads.

I. Install thermal insulation as follows:

1. Erect insulation vertically and hold in place with Z-furring members spaced 24 inches (610 mm) o.c.

3.6 APPLYING AND FINISHING GYPSUM BOARD, GENERAL

A. Gypsum Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.

B. Install sound-attenuation blankets, where indicated, prior to installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

C. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

D. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

E. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Avoid joints other than control joints at corners of framed openings where possible.

F. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

G. Attach gypsum panels to framing provided at openings and cutouts.

H. Spot grout hollow metal door frames for solid-core wood doors, hollow metal doors, and doors over 32 inches (813 mm) wide. Apply spot grout at each jamb anchor clip and immediately insert gypsum panels into frames.

I. Form control and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.

J. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases that are braced internally.

1. d Except where concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
2. d Fit gypsum panels around ducts, pipes, and conduits.
3. d Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide

joints to install sealant.

K. Isolate perimeter of nonload-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide 1/4- to ½-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.

L. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

1. d Space screws a maximum of 12 inches (304.8 mm) o.c. for vertical applications.

M. Space fasteners in panels that are tile substrates a maximum of 8 inches (203.2 mm) o.c.

3.7 GYPSUM BOARD APPLICATION METHODS

A. Single-Layer Application: Install gypsum wallboard panels as follows:

1. On ceilings, apply gypsum panels prior to wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
2d On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless parallel application is required for fire-resistance-rated assemblies. Use maximum-length panels to minimize end joints.

e. Stagger abutting end joints not less than one framing member in alternate courses of board.
f. At stairwells and other high walls, install panels horizontally.

3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.

B. Water-resistant Substrates: For substrates indicated to receive thin-set ceramic tile and similar rigid applied wall finishes, comply with the following:

1. Install water-resistant gypsum backing board panels at showers, tubs, and all bathroom walls. Install with 1/4-inch (6.4-mm) open space where panels abut other construction or penetrations.

C. Multi layer Application on Ceilings: Apply gypsum board indicated for base layers prior to applying base layers on walls/partitions; apply gypsum wallboard face layers in same sequence. Offset face-layer joints one framing member, 16 inches (400 mm) minimum, from parallel base-layer joints. Apply base layers at right angles to framing members, unless otherwise indicated.

D. Multi layer Application on Partitions/Walls: Apply gypsum board indicated for base layers and gypsum wallboard face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints. Stagger joints on opposite sides of partitions.

E. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:

1. Fasten with screws.

F. Multi layer Fastening Methods: Apply base layers of gypsum panels and face layer to base layers as follows:

1. Fasten both base layers and face layers separately to supports with screws.

3.8 INSTALLING TRIM ACCESSORIES

A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.

B. Install cornerbead at external corners.

C. Install edge trim where edge of gypsum panels would otherwise be exposed. Provide edge trim type with face flange formed to receive joint compound, except where other types are indicated.

1. Install LC-bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.
2. Install aluminum trim and other accessories where indicated.

D. Install control joints at locations indicated.

E. Install control joints according to ASTM C 840 and manufacturer's recommendations and in specific locations approved by Architect for visual effect.

3.9 FINISHING GYPSUM BOARD ASSEMBLIES

A. General: Treat gypsum board joints, interior angles, flanges of cornerbead, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.

B. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.

C. Apply joint tape over gypsum board joints and to flanges of trim accessories as recommended by trim accessory manufacturer.

D. Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.

1. Level 1 for ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistance-rated assemblies and sound-rated assemblies.
2. Level 2 at shower areas and mechanical, storage, electrical and miscellaneous utility rooms.
3. Level 4 everywhere unless indicated otherwise.

I. Finish water-resistant gypsum backing board forming base for ceramic tile to comply with ASTM C 840 and gypsum board manufacturer's directions for treatment of joints behind tile.

3.10 INSTALLING TRIM ACCESSORIES

A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect.

3.11 APPLYING TEXTURE FINISHES

A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces

receiving texture finishes according to texture finish manufacturer's instructions. Apply primer only to surfaces that are clean, dry, and smooth.

B. Texture Finish Application: Mix and apply finish to gypsum panels and other surfaces indicated to

receive texture finish according to texture finish manufacturer's directions. Using powered spray equipment, produce a uniform texture matching approved mockup and free of starved spots or other evidence of thin application or of application patterns.

C. Prevent texture finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If, despite these precautions, texture finishes contact these surfaces, immediately remove droppings and overspray as recommended by texture finish manufacturer to prevent damage.

3.12 FIELD QUALITY CONTROL

A. Above-Ceiling Observation: Architect will conduct an above-ceiling observation prior to installation of gypsum board ceilings and report any deficiencies in the Work observed. Do not proceed with installation of gypsum board to ceiling support framing until deficiencies have been corrected.

1 Notify Architect one week in advance of the date and the time when the Project, or part of the Project, will be ready for an above-ceiling observation.
2 Prior to notifying Architect, complete the following in areas to receive gypsum board ceilings:

a. Installation of 80 percent of lighting fixtures, powered for operation.
b. Installation, insulation, and leak and pressure testing of water piping systems.
c. Installation of air duct systems.
d. Installation of air devices.
e. Installation of mechanical system control air tubing.
f. Installation of ceiling support framing.

3.13 CLEANING AND PROTECTION

A. Promptly remove any residual joint compound from adjacent surfaces.

B. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure gypsum board assemblies are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 09250

SECTION 09300 - CERAMIC TILE

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. Quarry tile.

2. Glazed wall tile.
3. Stone thresholds installed as part of tile installations.
4. Metal edge strips installed as part of tile installations.

1.3 DEFINITIONS

A. Module Size: Actual tile size (minor facial dimension as measured per ASTM C 499) plus joint width indicated.

B. Facial Dimension: Nominal tile size as defined in ANSI A137.1.

1.4 PERFORMANCE REQUIREMENTS

A. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:

1. Level Surfaces: Minimum 0.6.

1.5 SUBMITTALS

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

B. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.

C. Samples for Verification:

1. Assembled samples with grouted joints for each type and composition of tile and for each color and finish required, at least 12 inches (300 mm) square and mounted on rigid panel. Use grout of type and in color or colors approved for completed work.
2. Full-size units of each type of trim and accessory for each color and finish required.
3. Stone thresholds in 6-inch (150-mm) lengths.
4. Metal edge strips in 6-inch (150-mm) lengths.

D. Material Test Reports: For each tile-setting and -grouting product.

1.6 QUALITY ASSURANCE

A. Source Limitations for Tile: Obtain all tile of same type and color or finish from one source or producer.

1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.

B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.

C. Source Limitations for Other Products: Obtain each of the following products specified in this Section through one source from a single manufacturer for each product:

1. Stone thresholds.
2. Joint sealants.
3. Metal edge strips.

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Store in unopened containers and protected from freezing.

1.8 PROJECT CONDITIONS

A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

1.9 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Products: Subject to compliance with requirements, provide one of the products specified.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 PRODUCTS, GENERAL

A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.

1. Provide tile complying with Standard grade requirements, unless otherwise indicated.
2. For facial dimensions of tile, comply with requirements relating to tile sizes specified in Part 1 "Definitions" Article.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting and Grouting Materials" Article.

C. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:

1. As selected by Architect from manufacturer's full range.

D. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

2.3 TILE PRODUCTS

A. Manufacturers:

1. American Olean; Div. of Dal-Tile International Corp.
2. Daltile; Div. of Dal-Tile International Inc.

B. Unglazed Quarry Tile: Square-edged flat tile as follows:

1. Wearing Surface: Abrasive aggregate embedded in surface.
2. Facial Dimensions: 6 by 6 inches (152 by 152 mm).
3. Thickness: 1/2 inch.
4. Face: Plain.
5. Products:

a. Quarry Naturals, American Olean
b. Quarry Tile, Daltile

C. Glazed Wall Tile: Flat tile as follows:

1. Module Size: 4-1/4 by 4-1/4 inches.
2. Thickness: 5/16 inch.
3. Face: Plain with cushion edges.
4. Products:

a. Bright & Matte (Groups 1 & 2), American Olean
b. Semigloss & Matte (Groups 1, 2, & 3), Daltile

D. Glazed Wall Tile Trim Units: Matching characteristics of adjoining flat tile and coordinated with sizes and coursing of adjoining flat tile where applicable. Provide shapes as follows, selected from manufacturer's standard shapes:

1. Base for Thin-Set Mortar Installations: Straight, module size to be 4 inches by width of adjacent floor tile installation.
2. Wainscot Cap for Thin-Set Mortar Installations: Surface bullnose, module size to match adjacent wall tile installation size.
3. Wainscot Cap for Flush Conditions: Regular flat tile for conditions where tile wainscot is shown flush with wall surface above.
4. External Corners for Thin-Set Mortar Installations: Surface bullnose.
5. Internal Corners: Field-butted square corners except with coved base and cap angle pieces designed to fit with stretcher shapes.

E. Quarry Tile Trim Units: Matching characteristics of adjoining flat tile and coordinated with sizes and coursing of adjoining flat tile where applicable. Provide shapes as follows, selected from manufacturer's standard shapes:

1. Base: Coved with surface bullnose top edge, facial dimensions of 5 x 6 inches.

2.4 THRESHOLDS

A. General: Fabricate to sizes and profiles indicated or required to provide transition between adjacent floor finishes.

1. Bevel edges at 1:2 slope, aligning lower edge of bevel with adjacent floor finish. Limit height of bevel to 1/2 inch (12.7 mm) or less, and finish bevel to match face of threshold.

B. Marble Thresholds: ASTM C 503 with a minimum abrasion resistance of 12 per ASTM C 1353 or ASTM C 241 and with honed finish.

1. Description: Match Architect's sample.

2.5 SETTING AND GROUTING MATERIALS

A. Manufacturers:

1. Bonsal, W. R., Company.
2. C-Cure.
3. LATICRETE International Inc.

B. Portland Cement Mortar (Thickset) Installation Materials: ANSI A108.1A and as specified below:

1. Cleavage Membrane: Asphalt felt, ASTM D 226, Type I (No. 15); or polyethylene sheeting, ASTM D 4397, 4.0 mils (0.1 mm) thick.
2. Reinforcing Wire Fabric: Galvanized, welded wire fabric, 2 by 2 inches (50.8 by 50.8 mm) by 0.062-inch (1.57-mm) diameter; comply with ASTM A 185 and ASTM A 82 except for minimum wire size.

C. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4, consisting of the following:

1. Prepackaged dry-mortar mix containing dry, redispersible, ethylene vinyl acetate additive to which only water must be added at Project site.

D. Medium-Bed, Latex-Portland Cement Mortar: Provide materials composed as follows, with physical properties equaling or exceeding those required for thin-set mortars based on testing of medium-bed specimens according to ANSI A118.4:

1. Prepackaged dry-mortar mix containing dry, redispersible, ethylene vinyl acetate additive to which only water must be added at Project site.

E. Standard Sanded Cement Grout: ANSI A118.6, color as indicated.

F. Standard Unsanded Cement Grout: ANSI A118.6, color as indicated.

G. Chemical-Resistant, Water-Cleanable, Tile-Setting and -Grouting Epoxy: ANSI A118.3.

1. Provide product capable of withstanding continuous and intermittent exposure to temperatures of up to 140 deg F (60 deg C) and 212 deg F (100 deg C), respectively, and certified by grout manufacturer for intended use.

2.6 ELASTOMERIC SEALANTS

A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Division 7 Section "Joint Sealants."

B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.

C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.

1. Products:

a. Dow Corning Corporation; Dow Corning 786.
b. GE Silicones; Sanitary 1700.
c. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
d. Tremco, Inc.; Tremsil 600 White.

D. Chemical-Resistant Sealants: For chemical-resistant floors, provide chemical-resistant elastomeric sealant of type recommended and produced by chemical-resistant mortar and grout manufacturer for type of application indicated, with proven service record and compatibility with tile and other setting materials, and with chemical resistance equivalent to mortar/grout. Include primer and backer rod recommended by manufacturer.

2.7 MISCELLANEOUS MATERIALS

A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

B. Metal Edge Strips: Angle or L-shape, height to match tile and setting-bed thickness, metallic or combination of metal and PVC or neoprene base, designed specifically for flooring applications, stainless steel; ASTM A 666, 300 Series exposed-edge material.

C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

D. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints that does not change color or appearance of grout.

2.8 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.

1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 Series of tile installation standards for installations indicated.
2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.

B. Provide concrete substrates for tile floors installed with thin-set mortar that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.

1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
2. Remove protrusions, bumps, and ridges by sanding or grinding.

C. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

D. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 INSTALLATION, GENERAL

A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.

B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.

C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.

F. Lay out tile wainscots to next full tile beyond dimensions indicated.

G. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Locate joints in tile surfaces directly above joints in concrete substrates.
2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

H. Grout tile to comply with requirements of the following tile installation standards:

1. For ceramic tile grouts (sand-portland cement; dry-set, commercial portland cement; and latex-portland cement grouts), comply with ANSI A108.10.
2. For chemical-resistant epoxy grouts, comply with ANSI A108.6.

3.4 FLOOR TILE INSTALLATION

A. General: Install tile to comply with requirements in the Floor Tile Installation Schedule, including those referencing TCA installation methods and ANSI A108 Series of tile installation standards.

1. For installations indicated below, follow procedures in ANSI A108 Series tile installation standards for providing 95 percent mortar coverage.

a. Tile floors in wet areas.
b. Tile floors composed of tiles 8 by 8 inches (200 by 200 mm) or larger.
c. Tile floors composed of rib-backed tiles.

B. Joint Widths: Install tile on floors with the following maximum joint widths:

1. Quarry Tile: 1/4 inch (6.35 mm).
2. Paver Tile: 1/4 inch (6.35 mm).

C. Stone Thresholds: Install stone thresholds at locations indicated; set in same type of setting bed as abutting field tile, unless otherwise indicated.

1. Set thresholds in latex-portland cement mortar for locations where mortar bed would otherwise be exposed above adjacent non-tile floor finish.

D. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile.

3.5 WALL TILE INSTALLATION

A. Install types of tile designated for wall installations to comply with requirements in the Wall Tile Installation Schedule, including those referencing TCA installation methods and ANSI setting-bed standards.

B. Joint Widths: Install tile on walls with the following maximum joint widths:

1. Glazed Wall Tile: 1/16 inch (1.6 mm).
2. Quarry Tile: 1/4 inch (6.35 mm).

3.6 CLEANING AND PROTECTING

A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.

1. Remove epoxy grout residue from tile as soon as possible.
2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.

B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.

C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

3.7 FLOOR TILE INSTALLATION SCHEDULE

A. Tile Installation: Interior floor installation on concrete; cement mortar bed (thickset) bonded to concrete; TCA F112 and ANSI A108.1B.

1. Tile Type: Unglazed paver and Glazed paver tile.
2. Thin-Set Mortar: Latex-portland cement mortar.
3. Grout: Standard sanded cement grout.

B. Tile Installation: Interior floor installation on concrete; thin-set mortar; TCA F113 and ANSI A108.5.

1. Tile Type: Glazed paver tile.
2. Thin-Set Mortar: Latex-portland cement mortar.
3. Grout: Standard sanded cement grout.

C. **Tile Installation (quarry tile in Kitchen areas):** Interior floor installation on concrete; cement mortar bed (thickset) with cleavage membrane, epoxy grout; TCA F114 and ANSI A108.1B.

1. Tile Type: Unglazed quarry tile.
2. Thin-Set Mortar: Latex-portland cement mortar.
3. Grout: Chemical-resistant, water-cleanable, tile-setting and -grouting epoxy.

3.8 WALL TILE INSTALLATION SCHEDULE

A. Tile Installation: Interior wall installation over gypsum board; thin-set mortar; TCA W243 and ANSI A108.5.

1. Tile Type: Glazed wall tile.
2. Thin-Set Mortar: Latex-portland cement mortar.
3. Grout: Standard unsanded cement grout.

END OF SECTION 09300

SECTION 09400 - EPOXY TERRAZZO

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. Thin-set epoxy terrazzo.

B. Related Sections include the following:

1. Division 7 Section "Joint Sealants" for sealants installed with terrazzo.

1.3 SUBMITTALS

A. Product Data: For each type of terrazzo and accessory indicated.

B. Shop Drawings: Include terrazzo fabrication and installation requirements. Include plans, elevations, sections, component details, and attachments to other Work. Show layout of the following:

1. Divider and control- and expansion-joint strips.
2. Base and border strips.
3. Abrasive strips.
4. Terrazzo patterns.

C. Samples for Initial Selection: Manufacturer's color plates showing the full range of colors and patterns available for each terrazzo type indicated.

D. Samples for Verification: For each type, material, color, and pattern of terrazzo and accessory required showing the full range of color, texture, and pattern variations expected. Label each terrazzo sample to identify manufacturer's matrix color and aggregate types, sizes, and proportions. Prepare samples of same thickness and from same material to be used for the Work in size indicated below:

1. Epoxy Terrazzo: 12” x 12” square samples, illustrating color, chip size and variation, chop gradation, matrix color.
2. Accessories: 12” long samples of each exposed strip item required.

E. Installer Certificates: Signed by manufacturers certifying that installers comply with requirements.

F. Qualification Data: For Installer.

G. Material Test Reports: For epoxy terrazzo.

H. Material Certificates: For epoxy terrazzo, in lieu of material test reports, when permitted by Architect, signed by manufacturers.

I. Maintenance Data: For epoxy terrazzo to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer (applicator) who is acceptable to epoxy terrazzo manufacturer to install manufacturer's products.

1. Engage an installer who is certified in writing by terrazzo manufacturer as qualified to install manufacturer's products.
2. Engage an installer who is a contractor member of NTMA.

B. Source Limitations: Obtain primary terrazzo materials through one source from a single manufacturer. Provide secondary materials including patching and fill material, joint sealant, and repair materials of type and from source recommended by manufacturer of primary materials.

C. Source Limitations for Aggregates: Obtain each color, grade, type, and variety of aggregate from one source with resources to provide materials of consistent quality in appearance and physical properties.

D. NTMA Standard: Comply with NTMA Guide Specification and written recommendations for terrazzo type indicated unless more stringent requirements are specified.

E. Mockups: Install mockups to verify selections made under sample Submittals and to demonstrate aesthetic effects and qualities of materials and execution.

1. For epoxy terrazzo, install mockups of at least 100 sq. ft. (9 sq. m) of typical flooring and base condition for each color and pattern in locations directed by Architect.
2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to terrazzo including, but not limited to, the following:

1. Inspect and discuss condition of substrate and other preparatory work performed by other trades.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review special terrazzo designs and patterns.
4. Review dust-control procedures.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting terrazzo installation.

B. Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during terrazzo installation.

C. Close spaces to traffic during epoxy terrazzo application and for not less than 24 hours after application unless manufacturer recommends a longer period.

D. Control and collect dust produced by grinding operations. Protect adjacent construction from detrimental effects of grinding operations.

1. Provide dustproof partitions and temporary enclosures to limit dust migration and to isolate areas from noise.

PART 2 - PRODUCTS

2.1 EPOXY TERRAZZO

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

B. Products: Subject to compliance with requirements, provide one of the following:

1. ChemRex, Inc./SKW-MBT; Novalite.
2. Crossfield Products Corp., Dex-O-Tex Division; SpectrumTerrazzo.
3. Key Resin Company; Key Epoxy Terrazzo.
4. Master Terrazzo Technologies, LLC; Morricite.
5. Polymerica Incorporated; MasterPiece ETS.
6. Quadrant Chemical Corporation; Quadset Epoxy Terrazzo.

C. Thickness: 1/4 inch (6.4 mm) or 3/8 inch (9.5 mm).

D. Materials:

1. Flexible Reinforcing Membrane: Manufacturer's resinous membrane for substrate crack preparation and reflective crack reduction.

a. Reinforcement: Fiberglass scrim.

2. Primer: Product of manufacturer recommended for substrate and use indicated.

3. Epoxy Resin: Manufacturer's standard recommended for use indicated and in color required for mix indicated.

a. Physical Properties without Aggregates:

1) Hardness: 60 to 85 per ASTM D 2240, Shore D.
2) Minimum Tensile Strength: 3000 psi (20.68 MPa) per ASTM D 638 for a 2-inch (50.8-mm) specimen made using a "C" die per ASTM D 412.
3) Minimum Compressive Strength: 10,000 psi (68.95 MPa) per ASTM D 695, Specimen B cylinder.
4) Chemical Resistance: No deleterious effects by contaminants listed below after 7-day immersion at room temperature per ASTM D 1308.

a) Distilled water.
b) Mineral water.
c) Isopropanol.
d) Ethanol.
e) 0.025 percent detergent solution.
f) 1.0 percent soap solution.
g) 10 percent sodium hydroxide.
h) 10 percent hydrochloric acid.
i) 30 percent sulfuric acid.
j) 5 percent acetic acid.

b. Physical Properties with Aggregates: For resin blended with Georgia White marble, ground, grouted, and cured per requirements in NTMA's "Guide Specification for Epoxy Terrazzo," comply with the following:

1) Flammability: Self-extinguishing, maximum extent of burning 0.25 inch (6.35 mm) per ASTM D 635.
2) Thermal Coefficient of Linear Expansion: 0.0025 inch/inch per deg F (0.0025 mm/mm per 0.5556 deg C) for temperature range of minus 12 to 140 deg F (minus 24 to 60 deg C) per ASTM D 696.

4. Marble Chips: Complying with NTMA gradation standards for mix indicated and containing no deleterious or foreign matter.

a. Hardness: Ha-10 minimum per ASTM C 241.
b. 24-Hour Absorption Rate: Less than 0.75 percent.
c. Dust Content: Less than 1.0 percent by weight.

5. Divider-Strip Adhesive: Epoxy-resin adhesive recommended by adhesive manufacturer for this use and acceptable to terrazzo manufacturer.
6. Finishing Grout: Resin based.
7. Seal Coat: Slip resistant, thin-coat terrazzo sealer of or approved by terrazzo manufacturer.

E. Mix: Comply with NTMA's "Guide Specification for Epoxy Terrazzo" and manufacturer's written instructions for component proportions and mixing.

1. Color and Pattern: As selected by Architect from manufacturer's full range.

2.2 DIVIDER AND ACCESSORY STRIPS

A. Thin-Set Divider Strips: Angle or T type, 1/4 inch (6.4 mm) deep.

1. Material: White zinc alloy
2. Top Width: 1/4 inch (6.4 mm)

B. Heavy-Top Divider Strips: Angle type in depth required for topping thickness indicated.

1. Bottom-Section Material: Matching top-section material.
2. Top-Section Material: White zinc alloy
3. Top-Section Width: 1/4 inch (6.4 mm) and 3/8 inch (9.5 mm).

C. Control-Joint Strips: Separate, double L-type angles, positioned back to back, that match material, thickness, and color of divider strips and in depth required for topping thickness indicated.

D. Accessory Strips: Match divider-strip width, material, and color unless otherwise indicated. Use the following types of accessory strips as required to provide a complete installation:

1. Base bead and base dividers.
2. Edge beads for exposed edges of terrazzo.

2.3 MISCELLANEOUS ACCESSORIES

A. Patching and Fill Material: Resinous product of or approved by terrazzo manufacturer and recommended by manufacturer for application indicated.

B. Joint Sealants: Recommended by terrazzo and sealant manufacturers and complying with requirements in Division 7 Section "Joint Sealants".

C. Cleaner: Chemically neutral cleaner with pH factor between 7 and 10 that is biodegradable, phosphate free, and recommended by cleaner manufacturer for use on terrazzo type indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Proceed with installation only after unsatisfactory conditions, including levelness tolerances, have been corrected.

3.2 PREPARATION

A. Clean substrates of substances that might impair epoxy terrazzo bond, including oil, grease, and curing compounds.

B. Provide clean, dry, and neutral substrate for terrazzo application. Determine dryness characteristics by performing moisture tests recommended by terrazzo manufacturer.

1. Concrete: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with epoxy terrazzo.

   a. Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.
   b. Repair damaged and deteriorated concrete according to terrazzo manufacturer's written recommendations.

2. Concrete Masonry Units: Fill voids and chipped areas with mortar mix to produce smooth, plumb surface.

C. Protect other work from dust generated by grinding operations. Control dust to prevent air pollution and comply with environmental protection regulations.

1. Erect and maintain temporary enclosures and other suitable methods to limit dust migration and to ensure adequate ambient temperatures and ventilation conditions during installation.

3.3 EPOXY TERRAZZO INSTALLATION

A. General:

1. Comply with NTMA's written recommendations for terrazzo and accessory installation.
2. Place, rough grind, grout, cure grout, fine grind, and finish terrazzo according to manufacturer's written instructions and NTMA's "Guide Specification for Epoxy Terrazzo."
3. Ensure that matrix components and fluids from grinding operations do not stain terrazzo by reacting with divider and control-joint strips.
4. Delay fine grinding until heavy trade work is complete and construction traffic through area is restricted.

B. Flexible Reinforcing Membrane:

1. Prepare and prefill substrate cracks with membrane material.
2. Install membrane to produce full substrate coverage in areas to receive terrazzo.
3. Reinforce membrane with fiberglass scrim.
4. Prepare membrane according to manufacturer's written instructions before applying substrate primer.

C. Primer: Apply to terrazzo substrates according to manufacturer's written instructions.

D. Divider and Accessory Strips: Install in locations indicated in adhesive setting bed without voids below strips.

1. Control-Joint Strips: Install back to back directly above substrate control joints.

a. Install with 1/4-inch (6.4-mm) gap between strips and install sealant in gap.

E. Abrasive Strips: Install with surface of abrasive strip positioned 1/16 inch (1.6 mm) or 1/32 inch (0.8 mm)] higher than terrazzo surface.

F. Fine Grinding: Grind with 120 or finer grit stones until all grout is removed from surface. Repeat rough grinding, grout coat, and fine grinding if large voids exist after initial fine grinding. Produce surface with a minimum of 70 percent aggregate exposure.

G. Remove and replace terrazzo areas that evidence lack of bond with substrate. Cut out terrazzo areas in panels defined by strips and replace to match adjacent terrazzo, or repair panels according to NTMA's written recommendations, as approved by Architect.

H. Construction Tolerances: Limit variation in terrazzo surface from level to 1/4 inch in 10 feet (6.4 mm in 3 m).

3.4 CLEANING AND PROTECTING

A. Remove grinding dust from installation and adjacent areas.

B. Wash surfaces with cleaner according to NTMA's written recommendations and manufacturer's written instructions; rinse surfaces with water and allow to dry thoroughly.

C. Seal surfaces according to NTMA's written recommendations. Apply sealer according to sealer manufacturer's written instructions.

D. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure terrazzo is without damage or deterioration at time of Substantial Completion.

END OF SECTION 09400

SECTION 09511 - ACOUSTICAL PANEL CEILINGS

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 ceilings consisting of acoustical panels and exposed suspension systems.

1.3 SUBMITTALS

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

B. Samples for Verification: Full-size units of each type of ceiling assembly indicated; in sets for each color, texture, and pattern specified, showing the full range of variations expected in these characteristics.

1. 6-inch- (150-mm-) square samples of each acoustical panel type, pattern, and color.
2. Set of 12-inch- (300-mm-) long samples of exposed suspension system members, including moldings, for each color and system type required.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed acoustical panel ceilings similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Source Limitations for Ceiling Units: Obtain each acoustical ceiling panel from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

C. Source Limitations for Suspension System: Obtain each suspension system from one source with resources to provide products of consistent quality in appearance and physical properties without delaying the Work.

1. Obtain both acoustical ceiling panels and suspension system from the same manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver acoustical panels and suspension system components to Project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.

B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet-work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.7 COORDINATION

A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.8 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Acoustical Ceiling Panels: Full size panels equal to 1.0 percent of quantity installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Acoustical Panel Ceiling Schedule at the end of Part 3.

2.2 ACOUSTICAL PANELS, GENERAL

A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.

1. Mounting Method for Measuring Noise Reduction Coefficient: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches (400 mm) away from test surface per ASTM E 795.

B. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.

1. Where appearance characteristics of acoustical panels are indicated by referencing ASTM E 1264 pattern designations and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range of products that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

C. Antimicrobial Treatment: Provide acoustical panels treated with manufacturer's standard antimicrobial solution consisting of a synergistic blend of substituted ammonium salts of alkylated phosphoric acids admixed with free alkylated phosphoric acid that inhibits fungus, mold, mildew, and gram-positive and gram-negative bacteria.

D. Panel Characteristics: Comply with requirements indicated in the Acoustical Panel Ceiling Schedule at the end of Part 3, including those referencing ASTM E 1264 classifications.

2.3 METAL SUSPENSION SYSTEMS, GENERAL

A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C 635 requirements.

B. Metal Suspension System Characteristics: Comply with requirements indicated in the Acoustical Panel Ceiling Schedule at the end of Part 3.

C. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.

1. High-Humidity Finish: Comply with ASTM C 635 requirements for "Coating Classification for Severe Environment Performance" where high-humidity finishes are indicated.

D. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated.

1. Postinstalled Powder-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 hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing and inspecting agency.

E. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:

1. Zinc-Coated Carbon-Steel Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
2. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, Direct Hung) will be less than yield stress of wire, but provide not less than 0.106-inch- (2.69-mm-) diameter wire.

F. Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from sheet metal of same material and finish as that used for exposed flanges of suspension system runners.

1. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
3. For narrow-face suspension systems, provide suspension system and manufacturer's standard edge moldings that match width and configuration of exposed runners.

G. Hold-Down Clips for Non-Fire-Resistance-Rated Ceilings: For interior ceilings consisting of acoustical panels weighing less than 1 lb/sq. ft. (4.88 kg/sq. m), provide hold-down clips spaced 24 inches (610 mm) o.c. on all cross tees.

H. Impact Clips: Provide manufacturer's standard impact-clip system designed to absorb impact forces against acoustical panels for interior ceilings..

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage, and other conditions affecting performance of acoustical panel ceilings.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordination: Furnish layouts for cast-in-place anchors, clips, and other ceiling anchors whose installation is specified in other Sections.

B. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION

A. General: Install acoustical panel ceilings to comply with publications referenced below per manufacturer's written instructions and CISCA's "Ceiling Systems Handbook."

1. Standard for Ceiling Suspension System Installations: Comply with ASTM C 636.

B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
4. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure; that are appropriate for substrate; and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
5. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, powder-actuated fasteners, or drilled-in anchors that extend through forms into concrete.
6. Do not attach hangers to steel deck tabs.
7. Do not attach hangers to steel roof deck. Attach hangers to structural members.
8. Space hangers not more than 48 inches (1200 mm) o.c. along each member supported directly from hangers, unless otherwise indicated; and provide hangers not more than 8 inches (200 mm) from ends of each member.

C. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.

1. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system

to a tolerance of 1/8 inch in 12 feet (3 mm in 3.6 m). Miter corners accurately and connect securely.

2. Do not use exposed fasteners, including pop rivets, on moldings and trim.

D. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

E. Install acoustical panels with undamaged edges and fitted accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

1. Arrange directionally patterned acoustical panels as follows:

a. As indicated on reflected ceiling plans.
b. Install panels with pattern running in one direction parallel to long axis of space.

2. For square-edged panels, install panels with edges fully hidden from view by flanges of suspension system runners and moldings.
3. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions, unless otherwise indicated or required.

3.4 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.5 ACOUSTICAL PANEL CEILING SCHEDULE

A. Water-Felted, Mineral-Base Acoustical Panels (ACT-1) for Acoustical Panel Ceiling: Where this designation is indicated, provide acoustical panels, treated with antimicrobial solution, and complying with the following:

1. Products: Provide one of the following:

a. Radar Climaplus, 2210 as manufactured by USG Interiors, Inc.
b. Fine Fissured, 1728 as manufactured by Armstrong

2. Classification: Panels fitting ASTM E 1264 for Type III, mineral base with painted finish; Form 2, water felted.
3. Pattern: Panels fitting ASTM E 1264 pattern designation fissured.
4. Color: White.
5. Light Reflectance Coefficient: Not less than LR 0.80.
6. Noise Reduction Coefficient: NRC 0.50 – 0.60.
7. Edge Detail: Reveal sized to fit flange of exposed suspension system members.
8. Thickness: 5/8 inch (16 mm).
9. Size: 24 by 24 inches (610 by 610 mm).

B. Gypsum Board Panels (ACT-2) with vinyl film overlay in kitchen/food service areas and as noted on drawings: Provide Type XX, Form A units per ASTM E1264 with washable vinyl-film overlay and gypsum core, complying with pattern and other requirements indicated.

1. Products: Provide one of the following:

a. Vinyltone as manufactured by Celotex Corporation
b. ClimaPlus Gypsum Lay-in Panels by USG Interiors, Inc.

2. Color: White.
3. Light Reflectance Coefficient: Not less than LR 0.80.
4. Noise Reduction Coefficient: N/A
5. Ceiling Attenuation Class: Not less than CAC 40.
6. Edge Detail: Square.
7. Thickness: ½”
8. Size: 24 by 24 inches (610 by 610 mm).

C. High NRC Acoustical Panels (ACT-3):

1. Products: Provide one of the following:
   a. Halcyon ClimaPlus by USG Interiors, Inc.
   b. Or equal by Armstrong.

2. Color: White.
3. Light Reflectance Coefficient: Not less than LR 80.
4. Noise Reduction Coefficient: .95
5. Ceiling Attenuation Class: Not less than CAC 20.
6. Edge Detail: Square.
7. Thickness: 1 inch
8. Size: 48 by 48 inches

D. High NRC Acoustical Panels (ACT-4):

1. Products: Provide one of the following:
   a. Halcyon ClimaPlus by USG Interiors, Inc.
   b. Or equal by Armstrong.

2. Color: White.
3. Light Reflectance Coefficient: Not less than LR 80.
4. Noise Reduction Coefficient: .95
5. Ceiling Attenuation Class: Not less than CAC 20.
6. Edge Detail: Square.
7. Thickness: 1 inch
8. Size: 24 by 24 inches

E. Suspension System for Acoustical Panel Ceiling: Where this designation is indicated, provide acoustical panel ceiling suspension system complying with the following:

1. Products: Provide one of the following:
   a. Armstrong Prelude (Prelude Plus at Kitchen area)
   b. USG – DXZ (ZXA at Kitchen Area)

2. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, G01 (Z001) coating designation, with prefinished 15/16-inch- (24-mm-) wide metal caps on flanges; other characteristics as follows:

   a. Structural Classification: Intermediate-duty system.
   b. Face Design: Flush face.
   c. Cap Material: Steel sheet.
   d. Cap Finish: Painted white.

END OF SECTION 09511

SECTION 09640 – STAGE WOOD FLOORING

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. Solid-wood strip or plank flooring.

1.3 SUBMITTALS

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

B. Shop Drawings: Show installation details including location and layout of each type of wood flooring and accessory.

C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors and finishes available for wood flooring.

D. Samples for Verification: For each type of wood flooring and accessory, with stain color and finish required, approximately 12 inches (300 mm) long and of same thickness and material indicated for the Work. Include sample sets showing the full range of normal color and texture variations expected.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed wood flooring similar in material, design, and extent to that indicated for this Project and whose work has resulted in wood flooring installations with a record of successful in-service performance.

B. Source Limitations: Obtain each type of material and product from one source with resources to provide materials and products of consistent quality in appearance and physical properties.

C. Hardwood Flooring: Comply with NOFMA grading rules for species, grade, and cut.

1. Certification: Provide flooring that carries NOFMA grade stamp on each bundle or piece.

D. Maple Flooring: Comply with MFMA grading rules for species, grade, and cut.

1. Certification: Provide flooring that carries MFMA mark on each bundle or piece.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver wood flooring materials in unopened cartons or bundles.

B. Protect wood flooring from exposure to moisture. Do not deliver wood flooring until after concrete, masonry, plaster, ceramic tile, and similar wet-work is complete and dry.

C. Store wood flooring materials in a dry, warm, well-ventilated, weathertight location.

D. Move wood flooring into spaces where it will be installed, at least seven days before installation.

1.6 PROJECT CONDITIONS

A. Conditioning: Maintain relative humidity planned for building occupants and an ambient temperature between 65 and 75 deg F (18 and 24 deg C) in spaces to receive wood flooring for at least seven days before installation, during installation, and for at least seven days after installation. After post-installation period, maintain relative humidity and ambient temperature planned for building occupants.

1. For unfinished products, open sealed packages to allow wood flooring to acclimatize.
2. Do not install flooring until it adjusts to the relative humidity of and is at the same temperature as the space where it is to be installed.
3. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by flooring and finish manufacturers.

B. Install factory-finished wood flooring after other finishing operations, including painting, have been completed.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Wood Flooring: Equal to 1 percent of amount installed for each type and finish indicated.

PART 2 - PRODUCTS

2.1 SOLID-WOOD STRIP AND PLANK FLOORING

A. Strip and Plank Flooring: Provide kiln-dried wood flooring as follows:

1. Species: Maple.
2. Grade: Clear.
3. Cut: Plain sawn.
4. Thickness: 3/4 inch (19 mm).
5. Face Width: 2-1/4 inches (57 mm).
6. Matching: Tongue and groove, and end matched.
7. Backs: Channeled (kerfed) for stress relief.
8. Random Lengths: Provide standard random-length strips complying with applicable grading rules.

2.2 FINISHING MATERIALS

A. Urethane Finish System: Complete system of compatible components that is recommended by finish manufacturer for application indicated.

1. Type: Solvent based, oil modified.
2. Stain: Penetrating and nonfading type.

   a. Color: As selected by Architect from manufacturer's full range.

3. Floor Sealer: Pliable, penetrating type.
4. Finish Coats: Formulated for multicoat application on wood flooring.
5. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

   a. Basic Coatings.
   b. BonaKemi USA, Inc.
   c. Dura Seal Division; Minwax Co., Inc.
   d. Hillyard Floor Treatments.
   e. Huntington Laboratories, Inc.
   f. National Coatings Co.

B. Wood Filler: Formulated to fill and repair seams, defects, and open-grain hardwood floors; compatible with finish system components and recommended by filler and finish manufacturers for use indicated. If required to match approved samples, provide pigmented filler.

2.3 ACCESSORY MATERIALS

A. Felt Underlayment: ASTM D 226, Type I, No. 15, asphalt-saturated felt.

B. Fasteners: As recommended by manufacturer, but not less than that recommended in NOFMA's "Installing Hardwood Flooring."

C. Cork Expansion Strip: Composition cork strip complying with FS HH-C-576, Type I-B, Class 2.

D. Wood Trim: In same species and grade as wood flooring, unless otherwise indicated.

1. Wood Base: 5/8 inch (16 mm) thick by 4 inches (100 mm) high.
2. Base Shoe Molding: 1/2 by 3/4 inch (13 by 19 mm).
3. Threshold: Tapered on each side and routed at bottom of one side to accommodate wood flooring.
4. Reducer Strip: 2 inches (51 mm) wide, tapered on one side, and in thickness matching flooring.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements, installation tolerances, and other conditions affecting performance of wood flooring. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Comply with flooring manufacturer's written instructions, but not less than recommendations in NOFMA's "Installing Hardwood Flooring," as applicable to flooring type.

B. Pattern: Lay wood flooring in pattern indicated on Drawings or, if not indicated, as directed by Architect.

C. Expansion Space: Provide expansion space at walls and other obstructions and terminations of flooring of not less than 3/4 inch (19 mm), unless otherwise indicated on Drawings.

1. Unless fully concealed by trim, fill expansion space with flush cork expansion strip.

D. Felt Underlayment: Where strip or plank flooring is nailed to solid-wood subfloor, install flooring over a layer of asphalt-saturated felt.

E. Solid-Wood Strip and Plank Flooring: Blind nail or staple flooring to substrate according to NOFMA's written recommendations.

1. Plank Flooring: For flooring of face width more than 3 inches (75 mm), install countersunk screws at each end of each piece in addition to blind nailing. Cover screw heads with wood plugs glued flush with flooring.

F. Accessories: Nail baseboard to wall and nail shoe molding or other trim to baseboard; do not nail to flooring.

3.3 SANDING AND FINISHING

A. Machine-sand flooring to remove offsets, ridges, cups, and sanding-machine marks that would be noticeable after finishing. Vacuum and tack with a clean cloth immediately before applying finish.

B. Apply filler according to manufacturer's written instructions.

1. Fill open-grained hardwood.
2. Fill and repair seams and defects.

C. Apply stain to match approved Sample if required.

D. Apply floor sealer according to finish manufacturer's written instructions.

E. Apply floor finish according to finish manufacturer's written instructions. Apply in number of coats recommended by finish manufacturer for application indicated, but not less than three.

3.4 PROTECTION

A. Cover installed wood flooring to protect it from damage or deterioration, before and after finishing, during remainder of construction period. Use heavy kraft-paper or other suitable covering. Do not use plastic sheet or film that could cause condensation.

1. Do not cover site-finished floors with kraft paper, or any other material, until finish reaches full cure, but not less than seven days after applying last coat.

END OF SECTION 09640

SECTION 09642 – GYMNASIUM WOOD FLOORING

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. Hard Maple wood flooring.
2. Painting of school logo artwork intergral with painting of floor lines. Contractor shall include in his price an allowance of $5,000 to include artwork in project.

B. Related Work:

1. Concrete Subfloors:
   a. Slab depression shall be 2-1/8" for 25/32" flooring
   b. Concrete subfloor depression shall be sufficient to accommodate the floor system. Slab shall be steel troweled and finished smooth to a tolerance of 1/8" in any 10' radius. High spots shall be ground level, and low spots filled in with approved leveling compound.
   c. Concrete slab aggregate shall be ¾ " screen crushed limestone or similar type material (no river gravel or pea gravel), free of curing agents. Concrete shall develop an average of 3,500-PSI compression after 28 days.
2. Gymnasium equipment is specified in Section 11490 – Gymnasium Equipment.

1.3 SUBMITTALS

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

B. Shop Drawings: Show installation details including location and layout of each type of wood flooring and accessory. Include game lines and accessory locations.

C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors and finishes available for wood flooring.

D. Samples for Verification: For each type of wood flooring and accessory, with stain color and finish required, approximately 12 inches (300 mm) long and of same thickness and material indicated for the Work. Include sample sets showing the full range of normal color and texture variations expected.

E. Maintenance Literature: Provide manufacturers care and maintenance brochures and instructions including temperature and humidity ranges for areas where flooring is installed. Meet with Owner to explain maintenance requirements for flooring.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed wood flooring similar in material, design, and extent to that indicated for this Project and whose work has resulted in wood flooring installations with a record of successful in-service performance.

1. Complete installation of the flooring system, as described in these specifications, shall be carried out by an experienced installer approved in writing by manufacturer of wood flooring, and the work shall be performed in accordance with most recent installation instructions of the manufacturer.

2. Installer shall be liable for all matters related to installation for a period of one year after the floor has been substantially installed and completed.

B. Performance Testing

1. Flooring system shall have been independently tested and certified to meet or exceed Athletic Performance according to the international standard DIN 18032, Part 2.

2. Consistency - Test point variance no greater than 3% +/- to the average force reduction and average ball rebound.

3. Flooring system shall have been independently tested and evaluated for Engineering Performance according to the Structural Testing and Engineering Measures (STEM).

B. Manufacturer: Manufacturer of gymnasium wood flooring shall be firm specializing in manufacturing products specified in this section.

C. Source Limitations: Obtain each type of material and product from one source with resources to provide materials and products of consistent quality in appearance and physical properties.

D. Maple Flooring: Comply with MFMA grading rules for species, grade, and cut.

1. Certification: Provide flooring that carries MFMA mark on each bundle or piece.

1.5 REFERENCES

A. MFMA - Maple Flooring Manufacturers Association

B. DIN Standards 18032, Part 2

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver wood flooring materials in unopened cartons or bundles.

B. Protect wood flooring from exposure to moisture. Do not deliver wood flooring until after concrete, masonry, plaster, ceramic tile, and similar wet-work is complete and dry.

C. Store wood flooring materials in a dry, warm, well-ventilated, weathertight location.

D. Move wood flooring into spaces where it will be installed, at least seven days before installation.

E. Flooring must be stored in a dry, well-ventilated area, not in contact with the masonry, to acclimate to building conditions and shall be installed at moisture content compatible with the normally expected environmental range of temperature and relative humidity achieved while the facility is occupied.

1.7 PROJECT CONDITIONS

A. Wood flooring specified herein shall not be installed until all masonry, painting, plaster, tile, marble and terrazzo work is completed, and overhead mechanical trades and painters have finished in the wood floor areas. The building shall be enclosed and weather tight.

B. Concrete subfloors shall dry at determined by industry standard testing procedures, free of foreign materials, and broom clean prior to installation of wood flooring.

C. Permanent heat, light and ventilation shall be installed and operating during and after installation, maintaining a temperature range compatible with the expected low and high moisture content of the flooring.

D. Maintain relative humidity planned for building occupants and an ambient temperature between 65 and 75 deg F (18 and 24 deg C) in spaces to receive wood flooring for at least seven days before installation, during installation, and for at least seven days after installation. Humidity conditions within the building shall approximate the humidity conditions that will prevail when the building is occupied.

1. For unfinished products, open sealed packages to allow wood flooring to acclimatize.
2. Do not install flooring until it adjusts to the relative humidity of and is at the same temperature as the space where it is to be installed.
3. Close spaces to traffic during flooring installation and for time period after installation recommended in writing by flooring and finish manufacturers.

E. After floors are finished, area to be kept secured to allow curing time for finish. Protect the floor by covering with non-marring kraft paper or red rosin paper with taped joints until acceptance of complete gymnasium floor.

F. Working conditions as described above shall be followed. Variations and substitutions shall be approved by floor manufacturer prior to installation. All variations shall be submitted to Architect in writing.

1.8 HUMIDITY CONTROL

A. Since all wood flooring will expand and contract as relative humidity varies, it is important to minimize extremes between low and high. Hardwood flooring is manufactured at a moisture content most compatible with a 35%-50% relative humidity range. Geographical regions and available mechanicals determine the typical range of temperature and humidity for each facility. Maintaining a 15% fluctuation between highest and lowest average indoor relative humidity provides limited shrinkage and growth. Facility managers should make use of available HVAC systems to prevent excessive tightening and shrinkage of flooring.

1.9 WARRANTY

A. Manufacturer warrants that materials supplied will be free from manufacturing defects for a period of one year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirement, provide wood gymnasium flooring by one of the following:

1. Conner: Rezill Channel
2. Robbins: Mach I System

2.2 MATERIALS

A. Vapor barrier: 6 mil polyethylene.

B. Subfloor (DIN): Factory assembled panels as supplied by manufacturer, constructed of two layers of 15/32≅ APA rated plywood sheeting, Exposure 1 with 1/2≅ X 2≅ X 2≅ pads attached nominally 8≅ on center. Pads shall be provided by manufacturer for system specified.

C. Channels - 16 gauge coated continuous steel.

D. Flooring:
   1. 25/32" X 2-1/4", Second & Better Grade, Northern Hard Maple Flooring, TGEM, MFMA Grade marked and stamped by manufacturer.
   2. Treating: flooring shall be treated with WOODLIFE F preservative.

E. Fasteners:
   1. Channel anchors: 1-1/4" long steel drive pins (or length as dictated by site conditions - achieving a minimum 900 lbs pull-out strength) applied with an air driven or low velocity power actuated tool.
   2. Flooring fasteners: 2" barbed cleats or coated staples.

F. Finish materials: Manufacturers top of the line oil modified polyurethane seal and finish.

G. Gameline paint shall be compatible with finish.

H. Wall Base - 3" X 4", heavy duty, molded, vented cove base with pre-molded outside corners.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements, installation tolerances, and other conditions affecting performance of wood flooring. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Subfloor
   1. Cover concrete with poly sealing and lapping joints a minimum of 6".
   2. Fasten first row of channels to concrete perpendicular to finish flooring with steel anchors driven approximately 14≅ on center along base of channels and within 3≅ of channel ends.
   3. Place pre-assembled subfloor panels parallel to channels, spacing end joints a minimum of 1/4≅. Capture exposed side edges of subfloor panel with adjacent channel. Offset channels end 4= from adjacent rows.
   4. Align each adjacent row of subfloor panels to form continuous 45 degree end joints throughout the subfloor assembly.
   5. Provide 1-1/2" expansion voids at perimeter and at all vertical obstructions. Install solid blocking under bleachers in the stacked position.

B. Maple flooring
   1. Install maple flooring by power nailing or stapling approximately 12" on center with end joints properly driven up.
   2. If required, size joints between flooring strips to allow for intermediate expansion in accordance with local humidity conditions.
   3. Provide 1-1/2" expansion voids at perimeter and at all vertical obstructions.

3.3 SANDING AND FINISHING

A. Maple flooring
   1. Machine sand with course, medium, and fine paper to a smooth, even and uniform surface.
   2. Remove sanding dust from entire surface by tack or vacuum.
   3. Inspect entire area of floor to insure that surface is acceptable for finishing, clean and completely free from sanding dust.
   4. Apply two (2) coats of approved seal and two (2) coats of approved finish per manufacturer's instructions.
   5. Buff and clean floor between coats.
   6. Game Lines: Apply game lines as indicated on drawings and shopdrawinsg, between seal and first coat of finish.

3.4 BASE INSTALLATION

A. Install vent cove base to walls with base cement or screws. Use premolded outside corners and mitered inside corners.

3.5 CLEANING AND PROTECTION

A. Remove excess and waste materials from work area.

B. Cover installed wood flooring to protect it from damage or deterioration, before and after finishing, during remainder of construction period. Use heavy kraft-paper or other suitable covering. Do not use plastic sheet or film that could cause condensation.

   1. Do not cover site-finished floors with kraft paper, or any other material, until finish reaches full cure, but not less than seven days after applying last coat.

END OF SECTION 09642

SECTION 09650 - RESILIENT FLOOR TILE

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. Vinyl composition tile (VCT).
2. Resilient wall base and accessories.

1.3 SUBMITTALS

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

B. Samples for Initial Selection: For each type of product indicated.

C. Samples for Verification: Full-size units of each color and pattern of resilient floor tile required.

1. Resilient Wall Base and Accessories: Manufacturer's standard-size Samples, but not less than 12 inches (300 mm) long, of each resilient product color and pattern required.

D. Maintenance Data: For resilient products to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide products identical to those tested for fire-exposure behavior per test method indicated by a testing and inspecting agency acceptable to authorities having jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store tiles on flat surfaces.

1.6 PROJECT CONDITIONS

A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

B. After postinstallation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

C. Close spaces to traffic during floor covering installation.

D. Close spaces to traffic for 48 hours after floor covering installation.

E. Install resilient products after other finishing operations, including painting, have been completed.

1.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Floor Tile: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.
2. Resilient Wall Base and Accessories: Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, of each type, color, pattern, and size of resilient product installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

2.2 COLORS AND PATTERNS

A. Colors and Patterns: As selected by Architect from manufacturer's full range.

2.3 VINYL COMPOSITION TILE

A. Vinyl Composition Tile (VCT): ASTM F 1066.

1. Armstrong World Industries, Inc.; Imperial Texture Standard Excelon
2. Mannington Mills, Inc.; Esseentials

B. Class: 2 (through-pattern tile).

C. Wearing Surface: Smooth.

D. Thickness: 0.125 inch (3.2 mm).

E. Size: 12 by 12 inches (305 by 305 mm).

F. Fire-Test-Response Characteristics:

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm per ASTM E 648.

2.4 RESILIENT WALL BASE

A. Wall Base: ASTM F 1861.

1. Burke Mercer Flooring Products.
2. Johnsonite.
3. Marley Flexco (USA), Inc.
4. Roppe Corporation.

B. Type (Material Requirement): TS (rubber, vulcanized thermoset)

C. Group (Manufacturing Method): I (solid, homogeneous).

D. Style: Cove (with top-set toe).

E. Minimum Thickness: 0.125 inch (3.2 mm).

F. Height: 4 inches (102 mm).

G. Lengths: Continuous rolls.

H. Outside Corners: Job formed.

I. Inside Corners: Job formed.

J. Surface: Smooth.

2.5 RESILIENT MOLDING ACCESSORY

A. Description: Nosing for carpet, Nosing for resilient floor covering, Joiner for tile and carpet.

1. Burke Mercer Flooring Products.
2. Johnsonite.
3. Marley Flexco (USA), Inc.
4. Roppe Corporation.

B. Material: Rubber.

2.6 RESILIENT STAIR ACCESSORIES (RS).

A. Treads: FS RR-T-650.

1. Johnsonite; VIRHS-RD
2. Marley Flexco (USA), Inc.; Radial II, Type 775

B. Surface Design: Type 2

1. Type 2 Design: Raised-disc pattern
2. Abrasive Strips: 2” carborundum strip for visually impaired

C. Nosing Style: Square, adjustable to cover angles between 60 and 90 degrees.

D. Nosing Height: 1-1/2 inches (38 mm).

E. Thickness: ¼”

F. Size: Lengths and depths to fit each stair tread in one piece or, for treads exceeding maximum lengths manufactured, in equal-length units.

G. Risers: Smooth, flat, coved-toe, 7 inches (178 mm) high by length matching treads; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.

1. Thickness: 0.125 inch (3.2 mm).

H. Stringers: Of same thickness as risers, height and length after cutting to fit risers and treads and to cover stair stringers; produced by same manufacturer as treads and recommended by manufacturer for installation with treads.

2.7 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic cement based formulation provided or approved by resilient product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

C. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of tiles, and in maximum available lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances, moisture content, and other conditions affecting performance.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
3. Moisture Testing:

    a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
    b. Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

C. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

D. Access Flooring Panels: Remove protective film of oil or other coating using method recommended by access flooring manufacturer.

E. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.

F. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

1. Do not install resilient products until they are same temperature as space where they are to be installed.

G. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 TILE INSTALLATION

A. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles square with room axis (unless otherwise noted) and in pattern indicated.

B. Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

1. Lay tiles with grain running in one direction and in pattern of colors and sizes indicated.

C. Scribe, cut, and fit tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.

D. Extend tiles into toe spaces, door reveals, closets, and similar openings.

E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.

F. Install tiles on covers for telephone and electrical ducts and similar items in finished floor areas. Maintain overall continuity of color and pattern with pieces of tile installed on covers. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

G. Adhere tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 RESILIENT WALL BASE INSTALLATION

A. Apply wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

B. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.

C. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

D. Do not stretch wall base during installation.

E. On masonry surfaces or other similar irregular substrates, fill voids along top edge of wall base with manufacturer's recommended adhesive filler material.

F. Job-Formed Corners:

1. Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends. Shave back of base at points where bends occur and remove strips perpendicular to length of base that are only deep enough to produce a snug fit without removing more than half the wall base thickness.
2. Inside Corners: Use straight pieces of maximum lengths possible. Form by cutting an inverted V-shaped notch in toe of wall base at the point where corner is formed. Shave back of base where necessary to produce a snug fit to substrate.

3.5 RESILIENT ACCESSORY INSTALLATION

A. Resilient Stair Accessories:

1. Use stair-tread-nose filler to fill nosing substrates that do not conform to tread contours.
2. Tightly adhere to substrates throughout length of each piece.
3. For treads installed as separate, equal-length units, install to produce a flush joint between units.

B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor coverings that would otherwise be exposed.

3.6 CLEANING AND PROTECTION

A. Perform the following operations immediately after completing resilient product installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

    a. Do not wash surfaces until after time period recommended by manufacturer.

B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.

1. Apply protective floor polish to horizontal surfaces that are free from soil, visible adhesive, and surface blemishes if recommended in writing by manufacturer.

    a. Use commercially available product acceptable to manufacturer.
    b. Coordinate selection of floor polish with Owner's maintenance service.

2. Cover products installed on horizontal surfaces with undyed, untreated building paper until Substantial Completion.
3. Do not move heavy and sharp objects directly over surfaces. Place hardboard or plywood panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.

END OF SECTION 09650

SECTION 09680 - CARPET

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. Tufted Carpet

B. Related Sections include the following:

1. Division 9 Section "Resilient Wall Base and Accessories" for resilient wall base and accessories installed with carpet.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance. Include installation recommendations for each type of substrate required.

B. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.

1. Carpet: 18-inch- (300-mm-) square Sample.

C. Schedule: Carpet schedule indicating carpet type locations. Use same room designations as indicated on drawings.

D. Maintenance Data: Include maintenance procedure, recommendations for maintenance materials and equipment, and suggested schedule for cleaning.

E. Manufacturer shall furnish written warranties to the owner prior to bid date.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.

B. Source: Obtain each type of carpet from once source and by a single manufacture.

C. Product Options: Products and manufacturers named in Part 2 establish requirements for product quality in terms of appearance, construction, and performance. Other manufacturers' products comparable in quality to named products and complying with requirements may be considered.

1. Subject to compliance with requirements, equals must match the selected color and have similar aesthetic appearance and tuft density, and closed-cell vinyl backing. Prior to bidding, each manufacturer indicated must submit for approval their product meeting these specifications. Only those products approved in writing will be acceptable for bidding.

1.5 DELIVERY, STORAGE, AND HANDLING

A. General: Comply with CRI 104, Section 5, "Storage and Handling."

1.6 PROJECT CONDITIONS

A. General: Comply with CRI 104, Section 6.1, "Site Conditions; Temperature and Humidity."

B. Environmental Limitations: Do not install carpet until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

C. Do not install carpet over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet manufacturer.

D. Where demountable partitions or other items are indicated for installation on top of carpet, install carpet before installing these items.

1.7 EXTRA MATERIALS

A. Provide additional 5% of each type, color and pattern furnished; product shall be rolled and bound. Coordinate storage location with Owner.

B. Deliver all unused carpet and large scraps to owner for attic stock. Dispose of scraps less than 2 square feet in area or less than 12” in width.

1.8 WARRANTY

A. Warranty shall be sole source responsibility of Manufacturer. Second source warranties and warranties that involve parties other than carpet manufacturer shall not be accepted.

B. If a product fails to perform as warranted when properly installed and maintained, the affected area will be repaired or replaced at the discretion of the Manufacturer.

C. Chair pods are not required for carpet warranty coverage.

D. Warranty shall not exclude carpet product installed on stairs provided it is properly installed and maintained.

E. Warranty shall be for a non-prorated period of twenty years and shall cover against:

1. Carpet Manufacturer’s Standard Warranty for Wear (10 years - Excessive Surface Wear: Not more that n15% loss of pile fiber height.)

2. Yarn Manufacturer’s Colorfastness Warranties

   a. Lightfastness (10 year)

   b. Atmospheric (5 year)

3. Static – Lifetime of Carpet (Excessive Static Electricity: Not more than 3.0 kV per AATCC 134)

4. Edge Ravel, Zippering, & Delamination (10 year). Tuft Bind Warranty in lieu of edge ravel and zippering is not acceptable

5. Stain Warranty (10 year)

6. Resiliency Loss of the Backing: More than 10% loss of backing resiliency

PART 2 - PRODUCTS

2.1 FIBER

A. Nylon Fiber: Solution Dyed or Yarn Dyed Bulked continuous Filament (BCF) Type 6, 6 or Type 6 Nylon.

B. Blends of fibers are acceptable, but fibers shall not be blended with fibers by other manufacturers.

C. Durable stain inhibitor shall be applied to the fiber during product manufacturing to resist fiber staining and soiling.
   1. Initial: minimum 500 ppm Fluorine per CRI TM-102
   2. After 2 extractions per AATCC 171: minimum 400 ppm Fluorine per CRI TM-102

D. Fiber to contain carbon-core filament static control. Topical treatments not allowed.

2.2 BACKING

A. Urethane Laminate
   1. Primary Backing: Synthetic Woven
   2. Pre-Coat (Fusion Coat): Polyurethane Elastomer
   3. Secondary Backing (Laminate Coat): Polyurethane Elastomer

2.3 PERFORMANCE CHARACTERISTICS

A. Flooring Radiant Panel: ASTM E-648/NFPA 253: Class 1 (CRF: 0.45 watts/aq cm or greater)

B. Federal Flammability: CPSC FF 1-70: Passes

C. Smoke Density: ASTM E-662/NFPA 258: less than 450 Flaming Mode

D. Electrostatic Propensity: AATCC 134 (Step & Scuff): 3.0 kV or less

E. Static Coefficient of Friction: ASTM C-1028: Passes ADA Guidelines for Accessible Routes

F. Delamination of Secondary Backing of Pile Floor Coverings: ASTM D-3936: No Delamination.

G. Light fastness: AATCC 16E; $\geq$ 4 @ 100 hours

H. Vetterman Drum: ASTM D-5417: Minimum 3 @ 22,000 cycles.

I. Moisture Barrier: Moisture penetration by impact @ 10 psi; No penetration of backing and seam after 10,000 impacts. Passes British Spill Test.

J. Air Flow Barrier: Air permeability of Textile Fabrics: No Air Flow through backing and seam.

K. Seam Integrity: Seam to remain intact after 50,000 cycles per Phillips Chair test.

L. VOC Chamber Testing: ASTM D-5116: Product inclusive of “dry” adhesive system meets State of Washington Indoor Air Quality Specification for Carpet immediately upon manufacture. (No air out period required)

2.4 CARPET

A. Carpet Type – C1

1.	Construction:	Textured Loop
2.	Gauge:	1/10, 1/13
3.	Stitches per inch:	8 - 13
4.	Pile Thickness:	0.062” – 0.138”
5.	Density Factor:	6,872 – 9,176
6.	Fiber System:	Eco Solution Q BCF SD Nylon, Chromell SD nylon, or equal.
7.	Dye Method:	100% Solution dyed
8.	Yarn Weight:	18-22 oz./sq. yd.

9. Backing: Urethane Laminate: Lifeloc Laminate, Ultraloc MP, or equal.

   a. Products: Subject to compliance with requirements, provide products from one of the following:
      1) Bigelow Commercial – Fairfield II
      2) Shaw Contract – Database

B. Carpet Type – C2

1. Construction: Pattern Loop
2. Gauge: 1/10, 1/12
3. Stitches per inch: 10 minimum
4. Pile Thickness: 0.092” – 0.160”
5. Density Factor: 6,261 – 7,370
6. Fiber System: 100% Chromell SD Nylon, 100% Eco Solution Q BCF SD Nylon, or equal.
7. Dye Method: Minimum 90% Solution dyed
8. Yarn Weight: 18-20 oz./sq. yd.
9. Backing: Urethane Laminate: Lifeloc Laminate, Ultraloc MP, or equal.

   a. Products: Subject to compliance with requirements, provide products from one of the following:
      1) Bigelow Commercial – Chainstitch
      2) Shaw Contract – Global

2.5 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided by or recommended by the following:

   1. By Carpet manufacturer.

B. Adhesives: Water-resistant, mildew-resistant, nonstaining type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet and that is recommended by the following:

   1. By Carpet manufacturer.

C. Seaming Cement: Hot-melt adhesive tape or similar product recommended by carpet manufacturer for taping seams and butting cut edges at backing to form secure seams and to prevent pile loss at seams.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet performance. Verify that substrates and conditions are satisfactory for carpet installation and comply with requirements specified.

B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
   1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by the carpet manufacturer.

2. Subfloor finishes comply with requirements specified in Division 3 Section "Cast-in-Place Concrete" for slabs receiving carpet.
3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and carpet manufacturer's written installation instructions for preparing substrates indicated to receive carpet installation.

B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.

C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by the carpet manufacturer.

D. Broom and vacuum clean substrates to be covered immediately before installing carpet. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 INSTALLATION

A. Install product in accordance with Manufacturer’s installation instructions.

B. Comply with carpet manufacturer's written recommendations for seam locations and direction of carpet; maintain uniformity of carpet direction and lay of pile. At doorways, center seams under the door in closed position.

1. Bevel adjoining border edges at seams with hand shears.
2. Level adjoining border edges.

C. Do not bridge building expansion joints with carpet.

D. Cut and fit carpet to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet manufacturer.

E. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.

G. Install pattern parallel to walls and borders.

H. Verify carpet match before cutting to ensure minimal variation between dye lots.

3.4 CLEANING AND PROTECTION

A. Perform the following operations immediately after installing carpet:

1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet manufacturer.
2. Remove yarns that protrude from carpet surface.
3. Vacuum carpet using commercial machine with face-beater element.

B. Protect installed carpet to comply with CRI 104, Section 15, "Protection of Indoor Installations."

C. Protect carpet against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet manufacturer.

END OF SECTION 09680

SECTION 09900 - PAINTING

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 surface preparation and field painting of exposed exterior and interior items and surfaces. Note: Epoxy finishes are specified in Specification Section 09901.

1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.

B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.

1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.

C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

1. Prefinished items include the following factory-finished components:

a. Architectural woodwork.
b. Acoustical wall panels.
c. Metal toilet enclosures.
d. Metal lockers.
e. Unit kitchens.
f. Elevator entrance doors and frames.
g. Elevator equipment.
h. Finished mechanical and electrical equipment.
i. Light fixtures.

2. Concealed surfaces include walls or ceilings in the following generally inaccessible spaces:

a. Foundation spaces.
b. Furred areas.
c. Ceiling plenums.
d. Utility tunnels.
e. Pipe spaces.
f. Duct shafts.
g. Elevator shafts.

3. Finished metal surfaces include the following:

   a. Anodized aluminum.
   b. Stainless steel.
   c. Chromium plate.
   d. Copper and copper alloys.
   e. Bronze and brass.

4. Operating parts include moving parts of operating equipment and the following:

   a. Valve and damper operators.
   b. Linkages.
   c. Sensing devices.
   d. Motor and fan shafts.

5. Labels: Do not paint over UL, FMG, or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

1.3 DEFINITIONS

A. General: Standard coating terms defined in ASTM D 16 apply to this Section.

1. Semigloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
2. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.4 SUBMITTALS

A. Product Data: For each paint system indicated. Include block fillers and primers.

1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.

B. Samples for Initial Selection: For each type of finish-coat material indicated.

1. After color selection, Architect will furnish color chips for surfaces to be coated.

C. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.

1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
2. Provide a list of materials and applications for each coat of each Sample. Label each Sample for location and application.
3. Submit TWO Samples on the following substrates for Architect's review of color and texture only:

a. Concrete Unit Masonry: 4-by-8-inch (100-by-200-mm) Samples of masonry, with mortar joint in the center, for each finish and color.
b. Stained or Natural Wood: 4-by-8-inch (100-by-200-mm) Samples of natural- or stained-wood finish on representative surfaces.
c. Ferrous Metal: 4-inch- (100-mm-) square Samples of flat metal and 8-inch- (200-mm-) long Samples of solid metal for each color and finish.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings 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. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.
8. VOC content.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain storage containers in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.7 PROJECT CONDITIONS

A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F (10 and 32 deg C).

B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F (7 and 35 deg C).

C. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

B. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:

1. Benjamin Moore & Co. (Benjamin Moore).
2. ICI Dulux Paint Centers (ICI Dulux Paints).
3. Sherwin-Williams Co. (Sherwin-Williams).

2.2 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

C. Colors: As selected by Architect from manufacturer's full range.

2.3 CONCRETE UNIT MASONRY BLOCK FILLERS

A. Concrete Unit Masonry Block Filler: Factory-formulated high-performance latex block fillers.

1. Benjamin Moore; Moorcraft Super Craft Latex Block Filler No. 285: Applied at a dry film thickness of not less than 8.1 mils (0.206 mm).
2. ICI Dulux Paints; Bloxfil 4000-1000 Interior/Exterior Heavy Duty Acrylic Block Filler: Applied at a dry film thickness of not less than 7.0 to 14.5 mils (0.178 to 0.368 mm).
3. Sherwin-Williams; PrepRite Interior/Exterior Block Filler B25W25: Applied at a dry film thickness of not less than 8.0 mils (0.203 mm).

2.4 EXTERIOR PRIMERS

A. Exterior Ferrous-Metal Primer: Factory-formulated rust-inhibitive metal primer for exterior application.

1. Benjamin Moore; Moore's IMC Alkyd Metal Primer No. M06: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
2. ICI Dulux Paints; 4160-XXXX Devguard Multi-Purpose Tank & Structural Primer. Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
3. Sherwin-Williams; Kem Kromik Universal Metal Primer B50NZ6/B50WZ1: Applied at a dry film thickness of not less than 3.0 mils (0.076 mm).

B. Exterior Galvanized Metal Primer: Factory-formulated galvanized metal primer for exterior application.

1. Benjamin Moore; Moore's IMC Acrylic Metal Primer No. M04: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
2. ICI Dulux Paints; 4160-XXXX Devguard Multi-Purpose Tank & Structural Primer: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
3. Sherwin-Williams; Galvite HS Paint B50WZ3: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).

2.5 INTERIOR PRIMERS

A. Interior Gypsum Board Primer: Factory-formulated latex-based primer for interior application.

1. Benjamin Moore; Moorcraft Super Spec Latex Enamel Undercoater & Primer Sealer No. 253: Applied at a dry film thickness of not less than 1.2 mils (0.030 mm).
2. ICI Dulux Paints; 1000-1200 Dulux Ultra Basecoat Interior Latex Wall Primer: Applied at a dry film thickness of not less than 1.2 mils (0.031 mm).
3. Sherwin-Williams; PrepRite 200 Latex Wall Primer B28W200 Series: Applied at a dry film thickness of not less than 1.6 mils (0.041 mm).

B. Interior Ferrous-Metal Primer: Factory-formulated quick-drying rust-inhibitive alkyd-based metal primer.

1. Benjamin Moore; Moore's IMC Alkyd Metal Primer No. M06: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
2. ICI Dulux Paints; 4160-6130 Devguard Multi-Purpose Tank & Structural Primer: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
3. Sherwin-Williams; Kem Kromik Universal Metal Primer B50NZ6/B50WZ1: Applied at a dry film thickness of not less than 3.0 mils (0.076 mm).

2.6 EXTERIOR FINISH COATS

A. Exterior Full-Gloss Alkyd Enamel: Factory-formulated full-gloss alkyd enamel for exterior application.

1. Benjamin Moore; Moore's IMC Urethane Alkyd Enamel M22: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
2. ICI Dulux Paints; 4308-XXXX Devguard Alkyd Industrial Gloss Enamel: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).
3. Sherwin-Williams; Industrial Enamel B-54 Series: Applied at a dry film thickness of not less than 2.0 mils (0.051 mm).

2.7 INTERIOR FINISH COATS

A. Interior Semigloss Acrylic Enamel: Factory-formulated semigloss acrylic-latex enamel for interior application.

1. Benjamin Moore; Moorcraft Super Spec Latex Semi-Gloss Enamel No. 276: Applied at a dry film thickness of not less than 1.2 mils (0.031 mm).
2. ICI Dulux Paints; 1406-XXXX Dulux Professional Acrylic Semi-Gloss Interior Wall & Trim Enamel: Applied at a dry film thickness of not less than 1.5 mils (0.038 mm).

3. Sherwin-Williams; ProMar 200 Interior Latex Semi-Gloss Enamel B31W200 Series: Applied at a dry film thickness of not less than 1.3 mils (0.033 mm).

B. Interior Semigloss Alkyd Enamel: Factory-formulated semigloss alkyd enamel for interior application.

1. Benjamin Moore; Moorcraft Super Spec Alkyd Semi-Gloss Enamel No. 271: Applied at a dry film thickness of not less than 1.4 mils (0.036 mm).
2. ICI Dulux Paints; 1516-XXXX Ultra-Hide Alkyd Semi-Gloss Interior Wall & Trim Enamel: Applied at a dry film thickness of not less than 1.7 mils (0.043 mm).
3. Sherwin-Williams; ProMar 200 Interior Alkyd Semi-Gloss Enamel B34W200 Series: Applied at a dry film thickness of not less than 1.7 mils (0.043 mm).

2.8 INTERIOR WOOD STAINS AND VARNISHES

A. Open-Grain Wood Filler: Factory-formulated paste wood filler applied at spreading rate recommended by manufacturer.

1. Benjamin Moore; Benwood Paste Wood Filler No. 238.
2. ICI Dulux Paints; none required.
3. Sherwin-Williams; Sher-Wood Fast-Dry Filler.

B. Interior Wood Stain: Factory-formulated alkyd-based penetrating wood stain for interior application applied at spreading rate recommended by manufacturer.

1. Benjamin Moore; Benwood Penetrating Stain No. 234.
2. ICI Dulux Paints; 1700-XXX WoodPride Interior Solventborne Wood Finishing Stain.
3. Sherwin-Williams; Wood Classics Interior Oil Stain A-48 Series.

C. Clear Sanding Sealer: Factory-formulated fast-drying alkyd-based clear wood sealer applied at spreading rate recommended by manufacturer.

1. Benjamin Moore; Moore's Interior Wood Finishes Quick-Dry Sanding Sealer No. 413.
2. ICI Dulux Paints; 1902-0000 WoodPride Interior Satin Polyurethane Varnish.
3. Sherwin-Williams; Wood Classics Fast Dry Sanding Sealer B26V43.

D. Interior Waterborne Clear Satin Varnish: Factory-formulated clear satin acrylic-based polyurethane varnish applied at spreading rate recommended by manufacturer.

1. Benjamin Moore; Stays Clear Acrylic Polyurethane No. 423, Satin.
2. ICI Dulux Paints; 1802-0000 WoodPride Interior Waterborne Aquacrylic Satin Varnish.
3. Sherwin-Williams; Wood Classics Waterborne Polyurethane Satin, A68 Series.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application. Comply with procedures specified in PDCA P4.

1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.

2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime.
2. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.

    a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
    b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
    c. If transparent finish is required, backprime with spar varnish.
    d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.
    e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

3. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.

    a. Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC-SP 6/NACE No. 3.
    b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.

c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.

4. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
3. Use only thinners approved by paint manufacturer and only within recommended limits.

3.3 APPLICATION

A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Paint colors, surface treatments, and finishes are indicated in the paint schedules.
2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
3. Provide finish coats that are compatible with primers used.
4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convector covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
7. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
8. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
9. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
10. Sand lightly between each succeeding enamel or varnish coat.

B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
2. Omit primer over metal surfaces that have been shop primed and touchup painted.
3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to

ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.

4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.

D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

E. Mechanical and Electrical Work: Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces.

F. Mechanical items to be painted include, but are not limited to, the following:

1. Uninsulated metal piping.
2. Uninsulated plastic piping.
3. Pipe hangers and supports.
4. Tanks that do not have factory-applied final finishes.
5. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
6. Duct, equipment, and pipe insulation having "all-service jacket" or other paintable jacket material.
7. Mechanical equipment that is indicated to have a factory-primed finish for field painting.

G. Electrical items to be painted include, but are not limited to, the following:

1. Switchgear.
2. Panelboards.
3. Electrical equipment that is indicated to have a factory-primed finish for field painting.

H. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

I. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

J. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

K. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.

L. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 FIELD QUALITY CONTROL

A. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:

1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.
2. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from Project site, pay for testing, and repaint surfaces previously coated with the noncomplying paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.6 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.

B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.

1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.7 EXTERIOR PAINT SCHEDULE

A. Ferrous Metal: Provide the following finish systems over exterior ferrous metal. Primer is not required on shop-primed items.

1. Full-Gloss Alkyd-Enamel Finish: Two finish coats over a rust-inhibitive primer.

a. Primer: Exterior ferrous-metal primer.
b. Finish Coats: Exterior full-gloss alkyd enamel.

B. Zinc-Coated Metal: Provide the following finish systems over exterior zinc-coated metal surfaces:

1. Full-Gloss Alkyd-Enamel Finish: Two finish coats over a galvanized metal primer.

a. Primer: Exterior galvanized metal primer.
b. Finish Coats: Exterior full-gloss alkyd enamel.

3.8 INTERIOR PAINT SCHEDULE

A. Concrete Unit Masonry: Provide the following finish systems over interior concrete masonry:

1. Semigloss Acrylic-Enamel Finish: Two finish coats over a block filler.

a. Block Filler: Concrete unit masonry block filler.
b. Finish Coats: Interior semigloss acrylic enamel.

B. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:

1. Semigloss Acrylic-Enamel Finish: Two finish coats over a primer.

a. Primer: Interior gypsum board primer.
b. Finish Coats: Interior semigloss acrylic enamel.

C. Ferrous Metal: Provide the following finish systems over ferrous metal:

1. Semigloss Alkyd-Enamel Finish: Two finish coats over a primer.

a. Primer: Interior ferrous-metal primer.
b. Finish Coats: Interior semigloss alkyd enamel.

3.9 INTERIOR STAIN AND NATURAL-FINISH WOODWORK SCHEDULE

A. Stained Woodwork: Provide the following stained finishes over new interior woodwork:

1. Waterborne Stain Satin-Varnish Finish: Two finish coats of waterborne clear satin varnish over a sealer coat and waterborne interior wood stain. Wipe wood filler before applying stain.

a. Filler Coat: Open-grain wood filler.
b. Stain Coat: Interior wood stain.
c. Sealer Coat: Clear sanding sealer.
d. Finish Coats: Interior waterborne clear satin varnish.

END OF SECTION 09900

SECTION 09901 - HIGH-PERFORMANCE COATINGS

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 surface preparation and field application of high-performance coating systems(Epoxy Coatings) to items and surfaces scheduled. The areas for application include, but are not limited to, all corridor walls, the kitchen and all accessory spaces, toilet rooms and janitor closets. Refer to the “finish schedule” for additional clarification of the scope of work.

1.3 DEFINITIONS

A. Standard coating terms defined in ASTM D 16 apply to this Section.

B. Gloss ranges used in this Section include the following:

1. Semigloss refers to medium-sheen finish with a gloss range between 30 and 65 when measured at a 60-degree meter.
2. High gloss refers to high-sheen finish with a gloss range more than 65 when measured at a 60-degree meter.

C. Environments: The following terms are used in Part 2 of this Section to distinguish between different corrosive exposures:

1. "Moderate environments" are corrosive industrial atmospheres with intermittent exposure to high humidity and condensation, occasional mold and mildew development, and regular cleaning with strong chemicals. Environments with exposure to heavy concentrations of chemical fumes and occasional splashing and spilling of chemical products are moderate environments.

1.4 SUBMITTALS

A. Product Data: For each coating system indicated. Include block fillers and primers.

1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference the specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each material specified.

B. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for each type of finish-coat material indicated.

1. After color selection, Architect will furnish color chips for surfaces to be coated.

C. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate.

1. Provide stepped Samples defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
2. List of material and application for each coat of each sample. Label each sample for location and application.
3. Submit samples on the following substrates for Architect's review of color and texture:

a. Concrete Masonry: Provide two 8-inch- (200-mm-) square samples of masonry, with mortar joint in the center, for each finish and color.

1.5 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced applicator who has completed high-performance coating system applications similar in material and extent to those indicated for Project and whose work has a record of successful in-service performance.

B. Source Limitations: Obtain primers and undercoat materials for each coating system from the same manufacturer as the finish coats.

C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample of each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.

1. Architect will select one room, area, or surface to represent surfaces and conditions for application of each type of coating and substrate.

a. Wall Surfaces: Provide samples on at least 100 sq. ft. (9 sq. m) of wall surface.
b. Small Areas and Items: Architect will designate items or areas required.

2. After permanent lighting and other environmental services have been activated, apply coatings in this room or to each surface as specified. Provide the required sheen, color, and texture of each surface.

a. After finishes are accepted, Architect will use the room or surface to evaluate coating systems of a similar nature.

3. Final approval of colors will be from benchmark samples.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label with the following information:

1. Name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.

6. Application instructions.
7. Color name and number.
8. Handling instructions and precautions.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Protect materials from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and applying coatings.

1.7 PROJECT CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 45 and 95 deg F (7 and 35 deg C).

B. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1. Allow wet surfaces to dry thoroughly and attain temperature and conditions specified before proceeding with or continuing coating operation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products indicated in the coating system descriptions.

B. Manufacturers' Names: The following manufacturers are referred to in the coating system descriptions by shortened versions of their names shown in parenthesis:

1. ICI Dulux Paints; Devoe Coatings (ICI).
2. Moore: Benjamin Moore & Co. (Moore).
3. Sherwin Williams; Industrial and Marine Coatings (S-W).

2.2 COATINGS MATERIALS, GENERAL

A. Material Compatibility: Provide primers, undercoats, and finish-coat materials 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.

B. Material Quality: Provide manufacturer's highest grade of the various high-performance coatings specified. Materials not displaying manufacturer's product identification are not acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the

exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.

2.3 COLORS

A. Colors: As selected by Architect from manufacturer's full range.

2.4 INTERIOR HIGH-PERFORMANCE COATING SYSTEMS

A. Concrete Masonry Units: Provide the following finish systems over interior concrete masonry block:

1. Moderate Environment (High-Gloss Finish): One finish coat over an intermediate coat and a block filler.

a. Block Filler: Acrylic or epoxy block filler applied at spreading rate recommended by manufacturer as sufficient to fill pores.

1) ICI: Bloxfil 4000 Interior/Exterior Heavy Duty Acrylic Block Filler.
2) Moore: M31/M32 Waterborne Epoxy Block Filler.
3) S-W: Epoxy Ester Masonry Filler Sealer B61W2 Series.

b. Intermediate Coat: Epoxy applied at spreading rate recommended by manufacturer to achieve a dry film thickness of 2.0 to 6.0 mils (0.051 to 0.152 mm), unless otherwise indicated.

1) ICI: Devran 224 HS High Build Epoxy Enamel.
2) Moore: M36/M37 Polyamide Epoxy Gloss Coating.
3) S-W: Tile Clad II High Solids B62WZ Series B60VZ70.

c. Topcoat: High-gloss epoxy applied at spreading rate recommended by manufacturer to achieve a dry film thickness of 2.0 to 6.0 mils (0.051 to 0.152 mm), unless otherwise indicated.

1) ICI: Devran 250 Direct to Metal Gloss Epoxy.
2) Moore: M36/M37 Polyamide Epoxy Gloss Coating.
3) S-W: Tile Clad II High Solids B62WZ Series B60VZ70.

PART 3 - EXECUTION

3.1 EXAMINATION

A. With Applicator present, examine substrates and conditions under which high-performance coatings will be applied, for compliance with coating application requirements.

1. Apply coatings only after unsatisfactory conditions have been corrected and surfaces to receive coatings are thoroughly dry.
2. Start of application is construed as Applicator's acceptance of surfaces within that particular area.

B. Coordination of Work: Review other Sections in which primers or other coatings are provided to ensure compatibility of total systems for various substrates. On request, furnish information on characteristics of specified finish materials to ensure compatible primers.

1. If a potential incompatibility of primers applied by others exists, obtain the following from the primer Applicator before proceeding:

a. Confirmation of primer's suitability for expected service conditions.
b. Confirmation of primer's ability to be top coated with materials specified.

2. Notify Architect about anticipated problems before using the coatings specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove plates, machined surfaces, and similar items already in place that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.

1. After completing coating operations, reinstall items that were removed; use workers skilled in the trades involved.

B. Cleaning: Before applying high-performance coatings, clean substrates of substances that could impair bond of coatings. Remove oil and grease before cleaning.

1. Schedule cleaning and coating application so dust and other contaminates from cleaning process will not fall on wet, newly coated surfaces.

C. Surface Preparation: Clean and prepare surfaces to be coated according to manufacturer's written instructions for each substrate condition and as specified.

1. Cementitious Substrates: Prepare concrete, brick, concrete masonry block, and cement plaster surfaces to be coated. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods to prepare surfaces.

a. Use abrasive blast-cleaning methods if recommended by coating manufacturer.
b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not coat surfaces if moisture content exceeds that permitted in manufacturer's written instructions.

D. Material Preparation: Carefully mix and prepare coating materials according to manufacturer's written instructions.

1. Maintain containers used in mixing and applying coatings in a clean condition, free of foreign materials and residue.
2. Stir materials before applying to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into the material. Remove film and, if necessary, strain coating material before using.
3. Use only the type of thinners approved by manufacturer and only within recommended limits.

3.3 APPLICATION

A. General: Apply high-performance coatings according to manufacturer's written instructions.

1. Use applicators and techniques best suited for the material being applied.
2. Do not apply high-performance coatings over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable coating film.
3. Coating colors, surface treatments, and finishes are indicated in the coating system descriptions.
4. Provide finish coats compatible with primers used.
5. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, convector covers, grilles, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.

    a. Coat surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
    b. Coat back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

B. Scheduling Coating: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for coating as soon as practicable after preparation and before subsequent surface deterioration.

1. The number of coats and film thickness required is the same regardless of application method.

    a. Omit primer on metal surfaces that have been shop primed and touchup painted.
    b. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer.
    c. Where manufacturer's written instructions require sanding, sand between applications to produce a smooth, even surface.
    d. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until coating has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and application of another coat does not cause undercoat to lift or lose adhesion.

2. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance. Give special attention to edges, corners, crevices, welds, exposed fasteners, and similar surfaces to ensure that they receive a dry film thickness equivalent to that of flat surfaces.

C. Application Procedures: Apply coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.

1. Brush Application: Use brushes best suited for material applied and of appropriate size for the surface or item being coated.

    a. Apply primers and first coats by brush unless manufacturer's written instructions permit using roller or mechanical applicators.
    b. Brush out and work brush coats into surfaces in an even film.
    c. Eliminate cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Neatly draw glass lines and color breaks.

2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by manufacturer for the material and texture required.
3. Spray Equipment: Use mechanical methods to apply coating if permitted by manufacturer's written instructions and governing regulations.

    a. Use spray equipment with orifice size recommended by manufacturer for material and texture required.
    b. Apply each coat to provide the equivalent hiding of brush-applied coats.
    c. Do not double back with spray equipment building-up film thickness of two coats in one pass, unless recommended by manufacturer.

D. Minimum Coating Thickness: Apply each material no thinner than manufacturer's recommended spreading rate. Provide total dry film thickness of the entire system as recommended by manufacturer.

E. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.

F. Completed Work: Match approved Samples for color, texture, and coverage. Remove, refinish, or recoat work that does not comply with specified requirements.

3.4 CLEANING

A. Cleanup: At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

1. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

3.5 PROTECTION

A. Protect work of other trades, whether being coated or not, against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.

1. Provide "Wet Paint" signs to protect newly coated finishes. After completing coating operations, remove temporary protective wrappings provided by others to protect their work.
2. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces. Comply with procedures specified in PDCA P1.

END OF SECTION 09901

SECTION 09961 – 1/8" DOUBLE BROADCAST DECORATIVE EPOXY FLOORING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Fluid applied seamless flooring and integral formed base.

2. Joint, edge, and termination strips.

3. Prior to installation of structural floor slab, advise architect, in writing, of all requirements of concrete substrate regarding finish, level tolerance, and curing; see INSPECTION in Part 3.

4. Locate all flexible joints required. See submittals below.

5. Accessories necessary for complete installation.

1.02 REFERENCE STANDARDS

The publications listed below from a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

A. American Society for Testing and Materials (ASTM) Publications:

C-307 Test Method for Tensile Strength of Chemical-Resistant Mortars.

C-501 Test Method for Relative Resistance to Wear Unglazed Ceramic Tile by the Taber Abraser.

C-531 Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.

C-579 Test Methods for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfaces.

C-580 Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.

C-884 Test Method for Thermal Compatibility Between Concrete and an Epoxy Resin Overlay.

D-570 Water Absorption of Plastics.

D-695 Compression Properties of Rigid Plastic.

D-1308 Test Method for Effect of Chemicals on Clear and Pigmented Organic Finishes.

B. Military Specifications (Mil. Spec.)

MIL D-3 134 F (Impact Resistance) Section 4.7.3.

MIL D-3 134 F (Indentation Resistance) Section 4.7.4.

MIL D-3234 F (Resistance to Elevated Temperature) Section 4.7.5.

C. ACI 301 Specifications for Structural Concrete for Buildings (most recent edition). Committee in Concrete 403 bulletin 59-43, Bond Strength to Concrete.

1.03 DEFINITIONS

A. Epoxy Resin Flooring specified under this section is referenced on the drawings as epoxy flooring.

1.04 SYSTEM DESCRIPTION

System shall be $^{1}/_{8}$ inch textured epoxy surfacing with broadcast colored quartz to form a decorative skid-resistant surface. Surface finish shall be a two component, chemically cured clear epoxy.

1.05 SUBMITTALS

A. Samples: Submit two 12 by 12 inch cured samples of each floor color indicating color combination and non-skid properties. Approved samples will be used during installation for product match.

B. Certified Test: Submit two copies of suppliers/ manufacturers written certification that flooring system meets or exceeds required properties.

C. Manufacturers Application Instructions: Submit descriptive data and specific recommendations for mixing, application, curing including any precautions of special handling instructions required to comply with the Occupational Safety and Health Act.

D. Shop Drawings: Shop Drawings shall be furnished showing installation of cove base and termination details, and details at floor material transitions and where adjoining equipment.
   1. Locate and provide detailing for flexible joints required for flooring in area of installation.

E. Maintenance Instructions: Submit current copies of the flooring manufacturer's printed recommendations on maintenance methods and products. Submit in accordance with Section 01730 - Operation and Maintenance Manuals.

1.06 QUALITY ASSURANCE

A. Materials used in the floor surfacing shall be the products of a single manufacturer.

B. Installation shall be performed by an applicator with minimum 3 years experience in work of similar nature and scope. Installer must be approved by the manufacturer of the floor surfacing materials. The contractor shall furnish a written statement from the manufacturer that the installer is acceptable.

C. Installer to verify locations of all flexible joints required by the provisions of this Section and by the recommendations of the related material manufacturers.
   1. Joint locations may or may not be shown in drawings.
   2. Refer to drawings required under SUBMITTALS above.

D. Installer to keep daily log of the date of installation, room number, type, color, and method of application of product being installed. Log must be available for inspection by the Architect upon request.

E. Contractor to have proven experience with specified system.

F. Mock-up: Prior to starting application of flooring, provide full scale mock-up to establish acceptable quality, durability, and appearance. Mock-up area must not be less than 50 square feet.
   1. Acceptable mock-up to be standard of quality for remaining work.
   2. Accepted work may remain in place. Unacceptable work to be removed and replaced until acceptable.

G. Qualifications
   Installer must be acceptable to Architect and Manufacturer.

1.07 PROJECT CONDITIONS

A. Maintain the ambient room and the floor temperatures at 50 degrees Fahrenheit, or above, for a period extending from 72 hours before, during and after floor installation. Concrete to receive surfacing shall have cured for at least 28 days and shall have been free of water for at least 7 days.

B. Advise other trades of fixtures and fittings not to be installed until flooring is cured and protected.

1.08 PROTECTION

A. Protect adjacent surfaces not scheduled to receive the flooring by masking, or by other means, to maintain these surfaces free of the flooring material.

B. Provide adequate ventilation and fire protection at all mixing and placing operations. Prohibit smoking or use of spark or flame producing devices within 50 feet of any mixing or placing operation.

C. Provide polyethylene or rubber gloves or protective creams for all workmen engaged

applying products containing epoxy.

1.09 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. All materials shall be delivered to project site in original manufacturer's sealed containers including type of material, batch numbers, date of manufacture, and pertinent labels intact and legible.

B. Store materials in dry protected area at a temperature between 50° F to 80° F.

C. Follow all manufacturer's specific instructions and prudent safety practices for storage and handling.

1.10 WARRANTY

A. Contractor to guarantee work under this Section to be free from defects of material, discoloration, and installation for the duration of the warranty period. Defects occurring during warranty period shall be repaired, in a manner satisfactory to the Owner and the Architect, at no additional cost to the Owner.
   Warranty Period: One (1) Year.

PART 2 PRODUCTS

2.01 MANUFACTURERS

. Specification based on Key Resin Company "Key Quartz B-125" sealed with Key #510 Epoxy Binder.

B. Provide conforming products based on:

Key Resin Company:Key Quartz B-125
Or equal product by "General Polymers – Ceramic Carpet Series".

2.02 MATERIALS

A. Cementitious Tile Backboard: See Section 09250 - Gypsum Drywall.

B. Flexible Membrane: Urethane Elastomer or Flexible Epoxy.

C. Prime Coat: Two component penetrating damp-proof epoxy.

D. Aggregates:
1. Blended quartz sand for base.
2. Color coated quartz #28 with a minimum Mohs. hardness of 6.
3. Blend mix to be a 80-10-10 mix of white, black and gray.

E. Matrix: Matrix-epoxy/aggregate composition.

F. Grout and Topcoats:
1. Clear two component epoxy grout
2. Clear two component epoxy sealer.

2.03 MIXING

A. Apply ceramic granular flooring to specified physical properties.

B. Physical Properties:
1. Weight: 1.00 lbs/sq.ft. per $^{1}/8$ inch thickness.

2. Compressive Strength:
   a. ASTM C-579
   b. 10,000 - 12,000 psi
3. Tensile Strength:
   a. ASTM C-307
   b. 2,400 psi

4. Flexural Strength:
   a. ASTM C-580
   b. 3,000 - 4,500 psi
5. Indentation:
   a. MIL-D-3134F Sec. 4.7.4
   b. Withstands 2,000 psi for 30 mins. without indentation
6. Impact Resistance:
   a. MIL-D-3134F, Sec. 4.7.3
   b. 16 ft/lbs.; no chipping, cracking, or delamination
7. Adhesive Strength to Concrete:
   a. ACI Committee 403
   b. 250 psi (100% concrete failure)
8. Water Absorption:
   a. ASTM-D-570
   b. 0.10
9. Abrasion Resistance:
   a. ASTM-C-501
   b. 32 mg. max.
10. Thermal Shock Resistance:
   a. ASTM-C-884
   b. passes
11. Thermal Coefficient of Expansion:
   a. ASTM-C-531
   b. 22×10^{-6} in/ in/ °F

C. Provide slip-resistant, cleanable textured finish. Samples to be approved by Owner and Architect.

D. Provide 4 inch integral coved base, typically.

2.04 FINISHES -Color as selected by Architect from the manufacturer's standard patterns.

PART 3 EXECUTION

3.01 PREPARATION

A. Obtain Architect's approval of mock-up before installing flooring; see QUALITY ASSURANCE in PART 1.

B. Preparation of Surface:

1. Inspect surfaces to receive flooring and verify that condition is smooth and free from conditions that will adversely affect execution, permanence, or quality of work.

   Remove all projections, all debris detrimental to flooring system, and dirt, oil contaminates, grease, and surface coatings affecting bond.

2. Notify Architect in writing prior to commencing work of any conditions deemed unsatisfactory for the installation; installation of flooring materials is understood as acceptance of the substrate as satisfactory.

3. Concrete: Test for moisture content; install no flooring over concrete until the slabs have been cured and are sufficiently dry to achieve permanent with coating as determined by material manufacturer's recommended bond and moisture test.

   a. Effectively remove concrete laitance by steel shot blasting or method approved by flooring manufacturer.

   b. Air drying: After completion of cleaning, allow concrete surface to air dry thoroughly prior to application of the floor surfacing. Blowers or oil free compressed air may be use. Do not use flame drying methods. Prior to application of surfacing, the concrete surface shall be tested for excessive moisture transmission in at least two locations. Test for moisture vapor transmission using the Calcium Chloride Test Procedure per ASTM-F-1869-98. Results may be confirmed by testing the relative humidity within the slab using the Photometer according to British Standard BS-8203. If the moisture transmission is greater than 3.5 pounds of water, or the relative humidity in the slab is greater than 80%, additional drying shall be undertaken to reduce the vapor transmission.

      If moisture transmission remains high, install a Vapor Retarding System to control moisture flow through the concrete. Vapor Retarding System shall be a two component, water phased epoxy slurry applied in one or two applications. The epoxy slurry shall have the following properties:

      - Greater than 100 times the permeability of standard epoxy slurries.
      - Excellent Ultra-Violet stability.
      - Solids Content — 85% by volume
      - Mixing Ratio — 5/1 by volume
      - Viscosity @ 75°F — 3,500 cps
      - Pot Life — 45 minutes @ 75°
      - Moisture Vapor Transmission (After 4 days) — <3 pounds

      Install Vapor Retarding System according to the manufacturer’s recommendations.

c. Treat cracks in concrete using manufacturer's recommended practice. Rout out crack and fill with semi-flexible epoxy; coat with flexible membrane in accordance with manufacturer's recommendation to prevent cracking through flooring system. Refer to section 3.02.B.

3.02 INSTALLATION

A. Install all floor materials in strict conformance with manufacturer's instructions.

B. Route out all cracks(larger than hairline width) and fill with Key Joint Filler. Apply Key Crack Isolation Membrane(Options: Key #400 Urethane Elastomer, Key #415 Single Comonent Urethane Elastomer, or Key #580 Flexible Epoxy) across the crack and 12 inches on either side at a spread rate of 50 square feet per gallon to achieve 25-30 mils dry.

C. Alternate to step B: Apply flexible membrane over entire floor surface as a crack preventive membrane at a spread rate of 50 square feet per gallon to achieve 25-30 mils dry.

D. Prime entire surface with recommended primer. If flexible membrane is to be applied over entire floor surface, it is optional to prime floor before installing membrane if Key #580 Flexible Epoxy is used. Key #400 and Key #415 Urethane Elastomers will require priming. Priming the top of the cured membrane prior to application of the Key Quartz system will probably be necessary if the membrane has cured for several days prior to installing the Key Quartz system.

E. Apply clear epoxy and broadcast decorative aggregate in two applications to achieve a minimum thickness of $^{1}/_{8}$ inch.

F. Apply epoxy grout coat and top coat to provide a uniform, dense surface.

G. Match finished work to approved samples, uniform in thickness, sheen, color, pattern and texture, and free from defects detrimental to appearance.

H. Apply temporary protection until floor is fully cured.

I. Integral Cove Base: Where scheduled, provide integral cove base formed from flooring over tile backerboard as specified under 09250 - Gypsum Drywall. Provide cove filler strips and trim strip at top of base as recommended by flooring manufacturer and trowel material up wall to form smooth, integral transition and base 4-6 inches high unless otherwise indicated or scheduled.

END OF SECTION

SECTION 10100 - VISUAL DISPLAY BOARDS

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. Porcelain enamel markerboards.
2. Natural-cork tackboards.

1.3 SUBMITTALS

A. Product Data: For each type of visual display board indicated. Include motor capacities and individual panel weights for sliding chalkboard and markerboard units.

B. Shop Drawings: For each type of visual display board required.

1. Include dimensioned elevations. Show location of joints between individual panels where unit dimensions exceed maximum panel length.
2. Include sections of typical trim members.
3. Show anchors, grounds, reinforcement, accessories, layout, and installation details.

C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors and textures available for the following:

1. Markerboards: Actual sections of porcelain enamel finish for each type of chalkboard and markerboard required.

D. Samples for Verification: Of the following products, showing color and texture or finish selected. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected. Prepare Samples from the same material to be used for the Work.

1. Visual Display Boards: Sample panels not less than 8-1/2 by 11 inches (215 by 280 mm), mounted on the substrate indicated for the final Work. Include a panel for each type, color, and texture required.
2. Aluminum Trim and Accessories: Samples of each finish type and color, on 6-inch- (150-mm-) long sections of extrusions and not less than 4-inch (100-mm) squares of sheet or plate. Include Sample sets showing the full range of color variations expected.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain visual display boards through one source from a single manufacturer.

B. Product Options: Drawings indicate size, profiles, and dimensional requirements of visual display boards and are based on the products indicated. Other manufacturers' products with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."

1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval and only to the extent needed to comply with performance requirements. Where modifications are proposed, submit comprehensive explanatory data to Architect for review.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify field measurements before preparation of Shop Drawings and before fabrication to ensure proper fitting. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Allow for trimming and fitting where taking field measurements before fabrication might delay the Work.
2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating chalkboards without field measurements. Coordinate wall construction to ensure actual dimensions correspond to established dimensions.

1.6 WARRANTY

A. General Warranty: The special porcelain enamel markerboard 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. Porcelain Enamel Markerboard Warranty: Submit a written warranty executed by manufacturer agreeing to replace porcelain enamel chalkboards that do not retain their original writing and erasing qualities, become slick and shiny, or exhibit crazing, cracking, or flaking within the specified warranty period, provided the manufacturer's written instructions for handling, installation, protection, and maintenance have been followed.

1. Warranty Period: 25 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products by one of the following:

1. Porcelain Enamel Markerboards:

a. Best-Rite Chalkboard Co.
b. Claridge Products and Equipment, Inc.
c. Greensteel, Inc.

2. Tackboards:

a. Best-Rite Chalkboard Co.
b. Claridge Products and Equipment, Inc.
c. Greensteel, Inc.

2.2 MATERIALS

A. Porcelain Enamel Markerboards: Balanced, high-pressure-laminated, porcelain enamel chalkboards of 3-ply construction consisting of face sheet, core material, and backing.

1. Face Sheet: 0.024-inch (0.61-mm) enameling grade steel especially processed for temperatures used in coating porcelain on steel. Coat exposed face and edges with a 3-coat process consisting of primer, ground coat, and color cover coat. Coat concealed face with a 2-coat process consisting of primer and ground coat. Fuse cover and ground coats to steel at manufacturer's standard firing temperatures, but not less than 1200 deg F (649 deg C).

   a. Cover Coat: Provide manufacturer's standard, light-colored, special writing surface with gloss finish intended for use with erasable dry markers.

2. Core: 1/2-inch- (12.7-mm-) thick, particleboard core material complying with requirements of ANSI A208.1, Grade 1-M-1.
3. Backing Sheet: 0.018-inch- (0.46-mm-) thick, galvanized steel sheet backing.
4. Laminating Adhesive: Manufacturer's standard, moisture-resistant, thermoplastic-type adhesive.

B. Natural-Cork Tackboards: Single-layer, 1/4-inch- (6.4-mm-) thick, seamless, compressed fine-grain, bulletin board quality, natural-cork sheet; face sanded for natural finish; complying with MS MIL-C-15116, Type II.

1. Backing: Factory laminate cork face sheet under pressure to 3/8-inch- (9.5-mm-) thick fiberboard backing.

2.3 ACCESSORIES

A. Metal Trim and Accessories: Fabricate frames and trim of not less than 0.062-inch- (1.57-mm-) thick, extruded-aluminum alloy, size and shape as indicated, to suit type of installation. Provide straight, single-length units. Keep joints to a minimum. Miter corners to a neat, hairline closure.

1. Where size of visual display boards or other conditions require support in addition to normal trim, provide structural supports or modify trim as indicated or as selected by Architect from manufacturer's standard structural support accessories to suit conditions indicated.
2. Field-Applied Trim: Manufacturer's standard snap-on trim with no visible screws or exposed joints.
3. Markertray: Manufacturer’s standard, continuous, solid, extrusion-type, aluminum markertray with ribbed section and smoothly curved exposed ends for each markerboard.
4. Map Rail: Furnish map rail at top of each unit, complete with the following accessories:

   a. Display Rail: Provide continuous cork display rail approximately 1 or 2 inches (25 or 50 mm) wide, as indicated, integral with map rail.
   b. End Stops: Provide one end stop at each end of map rail.
   c. Map Hooks: Provide 2 map hooks for every 48 inches (1220 mm) of map rail or fraction thereof.
   d. Flag Holder: Provide one flag holder for each room.

2.4 FABRICATION

A. Porcelain Enamel Markerboards: Laminate facing sheet and backing sheet to core material under pressure with manufacturer's recommended flexible, waterproof adhesive.

B. Assembly: Provide factory-assembled markerboard and tackboard units, unless field-assembled units are required.

1. Make joints only where total length exceeds maximum manufactured length. Fabricate with minimum number of joints, balanced around center of board, as acceptable to Architect.
2. Provide manufacturer's standard vertical joint system between abutting sections of chalkboards.
3. Provide manufacturer's standard mullion trim at joints between chalkboards and tackboards.

2.5 FINISHES

A. General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.

B. Finish designations prefixed by AA conform to the system established by the Aluminum Association for designating aluminum finishes.

C. Class II, Clear Anodic Finish: AA-M12C22A31 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class II, clear coating 0.010 mm or thicker) complying with AAMA 607.1.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine wall surfaces, with Installer present, for compliance with requirements and other conditions affecting installation of visual display boards.

1. Surfaces to receive markerboards shall be free of dirt, scaling paint, and projections or depressions that would affect smooth, finished surfaces of chalkboards or markerboards.
2. Surfaces to receive tackboards shall be dry and free of substances that would impair the bond between tackboards and substrate.
3. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Deliver factory-built visual display boards completely assembled in one piece without joints, where possible. If dimensions exceed panel size, provide 2 or more pieces of equal length as acceptable to Architect. When overall dimensions require delivery in separate units, prefit components at the factory, disassemble for delivery, and make final joints at the site. Use splines at joints to maintain surface alignment.

B. Install units in locations and at mounting heights indicated and according to manufacturer's written instructions. Keep perimeter lines straight, plumb, and level. Provide grounds, clips,

backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.

C. Coordinate Project-site-assembled units with grounds, trim, and accessories. Join parts with a neat, precision fit.

3.3 ADJUSTING AND CLEANING

A. Verify that accessories required for each unit have been properly installed and that operating units function properly.

B. Clean units according to manufacturer's written instructions.

END OF SECTION 10100

SECTION 10155 - TOILET COMPARTMENTS

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 toilet compartments and screens as follows:

1. Type: Solid-plastic, phenolic core.
2. Compartment Style: Overhead braced and floor anchored.

1.3 SUBMITTALS

A. Product Data: For each type and style of toilet compartment and screen specified. Include details of construction relative to materials, fabrication, and installation. Include details of anchors, hardware, and fastenings.

B. Shop Drawings: For fabrication and installation of toilet compartment and screen assemblies. Include plans, elevations, sections, details, and attachments to other work.

1. Show locations of reinforcement and cutouts for compartment-mounted toilet accessories.

C. Samples for Initial Selection: Manufacturer's color charts consisting of sections of actual units showing the full range of colors, textures, and patterns available for each type of compartment or screen indicated.

D. Samples for Verification: Of each compartment or screen color and finish required, prepared on 6-inch- (150-mm-) square Samples of same thickness and material indicated for Work.

1.4 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions in areas of installation by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating units without field measurements. Coordinate supports, adjacent construction, and fixture locations to ensure actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Columbia Partitions – Super HD-8433-BR by Partition Systems, Inc. or equal by the following:
2. Accurate Partitions Corporation.
3. Ampco Products, Inc.
4. Bobrick Washroom Equipment, Inc.
5. Bradley.

2.2 MATERIALS

A. General: Provide materials that have been selected for surface flatness and smoothness. Exposed surfaces that exhibit pitting, seam marks, roller marks, stains, discolorations, telegraphing of core material, or other imperfections on finished units are unacceptable.

B. Solid-Plastic, Phenolic Core: Solid phenolic core with melamine facing on both sides, fused to substrate without visible glue line or seam. Provide units with eased edges and with minimum 3/4-inch- (19-mm-) thick doors and pilasters and minimum 1/2-inch- (13-mm-) thick panels and screens. Provide melamine color as follows:

1. Color: One color in each room as selected by Architect from manufacturer's full range of colors.

2. Pilaster Shoes: ASTM A 167, Type 302/304 Stainless Steel, minimum 4" high, 18 gauge, finished with #3 Directional Polish, attached with Stainless Steel Through Bolts.

3. Continuous Brackets: Full High (57.5") Extruded 6063-T5 Aluminum with a Satin Anodized finish. The minimum weight shall be 1.685 pounds per lineal foot. Inside of opening of Bracket shall be 50" for panels, .75" for pilasters. AII holes for mounting to wall and panel/pilaster shall be pre-drilled. Holes are to be spaced at 9" O.C. along the full length of the Bracket for a total of fourteen (14) holes for mounting to the wall and seven (7) holes for mounting to the panel/pilaster. Each Bracket is to have minimum wall thickness of. 125". Each Bracket is to be packaged in a separate poly tube, and is to be labeled by stock number and manufacturer.

4. Continuous Hinge: Continuous 14 Gauge Stainless Steel Hinge (57.5"). Hinge shall be 3" wide and shall have five (5) Stainless Steel wire springs for self-closing action. Pivot pin shall be ,250" in diameter, and shall be made of Type 302/304 Stainless Steel. Hinges shall provide emergency access by lifting the door. Hinges shall be pre-drilled for mounting to door and pilaster. Mounting holes shall be at 9" O.C. for Through-Bolting with Stainless Steel fasteners. Each Hinge is to be packaged in a separate poly tube, and is to be labeled by stock number, manufacturer, and left or right hand.

5. Emergency Access Strike and Keeper: Heavy Duty Cast Stainless Steel with a Satin finish. The Strike and Keeper shall he 2.50" high, with the mounting holes at 1.50" O.C., and the wall thickness shall be a minimum of. 125". The Strike and Keeper shall have a slot, .80" X .29" on the top and bottom of the Strike and Keeper, to receive the Slide Latch Bar and to allow for emergency access by lifting the door. The Strike and Keeper shall have an integral rubber bumper door stop. The stock number shall he molded into the back of the Strike and Keeper for ease in identification. Each Strike and Keeper shall

be packaged in a separate poly bag, and is to be labeled by stock number and manufacturer. Furnish one per door.

6. Coat Hook: Heavy Duty Cast Stainless Steel with a Satin finish. Coat Hook and Bumper shall be 2.340" high, 1.230" wide and shall protrude out from the door 3.05". The hook portion shall have a finished diameter of .250". The stock number shall be molded into the back of the Coat Hook and Bumper for ease in identification. Each Coat Hook and Bumper shall be packaged in a separate poly bag, and is to be labeled by stock number and manufacturer. Furnish one per door.

7. Door Stop: Heavy Duty Cast Stainless Steel with a Satin finish. Plated Zarnac Door Stops are unacceptable. Door stop shall have a 2.125" base diameter and shall protrude 1.80" from the wall. The bumper at the end of the Door Stop shall be ,250" thick. The diameter of the shaft shall he .6875". The stock number shall be molded into the back of the Door Stop for ease in identification. Each Door Stop shall be packaged in a separate poly bag, and is to be labeled by stock number and manufacturer. Furnish one for each Disabled Accessible door.

8. Pull Handle: Heavy Duty Cast Stainless Steel with a Satin finish. Plated Zamac Door Pulls are unacceptable. Pull Handle shall protrude from the face of the door, 940" and shall be 4.735" long. The Pull Handle shall have mounting holes drilled and tapped for 10/24 threads at 3.50" O.C.. The Pull Handle shall be .655" wide and shall be mounted back to back with the Slide Latch. The stock number shall be molded into the back of the Pull Handle for ease in identification. Each Pull Handle shall be packaged in a separate poly bag, and is to be labeled by stock number and manufacturer. Furnish one for each Disabled Accessible door.

9. Overhead Bracing (Headrail): Continuous Heavy Duty Extruded 6063-T5 Aluminum Headrail with Anti-Grip profile. Headrail shall have integral reinforcing channel and curtain track. Headrail shall have a Satin Anodized finish. Provide Headrail Comer Brackets, Wall Brackets, and Headrail End Caps as required. The Headrail and Headrail Brackets shall have a minimum wall height of 2". The minimum wall thickness of the Headrail and Headrail Brackets shall be.125". Each Headrail Bracket is to be packaged in a separate poly bag, and is to be labeled by stock number and manufacturer.

10. Anchorages and Fasteners: All Fasteners shall be Chrome Plated Brass with theft proof heads, Through-Bolted noted otherwise. No chrome-plated steel will be acceptable.

11. Slide Latch: Heavy Duty Cast Stainless Steel with a Satin finish. The Slide Latch shall be surface mounted. The slide bar shall be.150" thick, 1.020" wide and 3.720" long. Latch shall have an internal Stainless Steel buffering spring to prevent damage when door is inadvertently slammed against the Latch. Mounting holes are to be spaced at 3.50" 0.c.. Latch knob is to be riveted to the slide bar and then welded to insure that the knob will not come off. The stock number is to molded into the back of the Slide Latch for ease in identification. Each Slide Latch shall be packaged in separate poly bag, and is to be labeled by stock number and manufacturer. Furnish one per door.

2.3 FABRICATION

A. General: Provide standard doors, panels, screens, and pilasters fabricated for compartment system. Provide units with cutouts and drilled holes to receive compartment-mounted hardware, accessories, and grab bars, as indicated.

B. Overhead-Braced-and-Floor-Anchored Compartments: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism, fasteners, and anchors at pilasters to suit

floor conditions. Make provisions for setting and securing continuous head rail at top of each pilaster. Provide shoes at pilasters to conceal supports and leveling mechanism.

C. Doors: Unless otherwise indicated, provide 24-inch- (610-mm-) wide in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide out-swinging doors with a minimum 32-inch- (813-mm-) wide clear opening for compartments indicated to be handicapped accessible.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Comply with manufacturer's written installation instructions. Install units rigid, straight, plumb, and level. Provide clearances of not more than 1/2 inch (13 mm) between pilasters and panels and not more than 1 inch (25 mm) between panels and walls. Secure units in position with manufacturer's recommended anchoring devices.

1. Secure panels to walls and panels with not less than 2 stirrup brackets attached near top and bottom of panel. Locate wall brackets so holes for wall anchors occur in masonry or tile joints. Align brackets at pilasters with brackets at walls.

B. Overhead-Braced-and-Floor-Anchored Compartments: Secure pilasters to floor and level, plumb, and tighten. Secure continuous head rail to each pilaster with not less than 2 fasteners. Hang doors and adjust so tops of doors are parallel with overhead brace when doors are in closed position.

3.2 ADJUSTING AND CLEANING

A. Hardware Adjustment: Adjust and lubricate hardware according to manufacturer's written instructions for proper operation. Set hinges on in-swinging doors to return to fully closed position when unlatched. Set hinges on out-swinging doors and swing doors in entrance screens to return to fully closed position.

B. Provide final protection and maintain conditions that ensure toilet compartments and screens are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 10155

SECTION 10200 - LOUVERS AND VENTS

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. Fixed, extruded-aluminum louvers.

1.3 DEFINITIONS

A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.

1.4 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide louvers capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures shall be considered to act on vertical projection of louvers.

1. Wind Loads: Determine loads based on a uniform pressure of 30 lbf/sq. ft. (1436 Pa), acting inward or outward.

B. Thermal Movements: Provide louvers 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 (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

C. Air-Performance, Water-Penetration, Air-Leakage, and Wind-Driven Rain Ratings: Provide louvers complying with performance requirements indicated, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width according to AMCA 500-L.

1.5 SUBMITTALS

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

B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other Work. Show blade profiles, angles, and spacing.

1. For installed louvers and vents indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Samples for Initial Selection: For units with factory-applied color finishes.

D. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver.

1.6 QUALITY ASSURANCE

A. Source Limitations: Obtain louvers and vents through one source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

B. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify louver openings by field measurements before fabrication and indicate measurements on Shop Drawings.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish opening dimensions and proceed with fabricating louvers without field measurements. Coordinate construction to ensure that actual opening dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Louvers:

a. Airline Products Co.
b. Airolite Company (The).
c. Arrow United Industries.
d. Construction Specialties, Inc.
e. Greenheck.
f. Ruskin Company; Tomkins PLC.

2.2 MATERIALS

A. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy 6063-T5 or T-52.

B. Fasteners: Of same basic metal and alloy as fastened metal or 300 Series stainless steel, unless otherwise indicated. Do not use metals that are incompatible with joined materials.

1. Use types and sizes to suit unit installation conditions.
2. Use Phillips flat-head screws for exposed fasteners, unless otherwise indicated.

C. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, made from stainless-steel components, with capability to sustain, without failure, a load equal to 4 times the loads imposed, for concrete, or 6 times the load imposed, for masonry, as determined by testing per ASTM E 488, conducted by a qualified independent testing agency.

D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

2.3 FABRICATION, GENERAL

A. Assemble louvers in factory to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Vertical Assemblies: Where height of louver units exceeds fabrication and handling limitations, fabricate units to permit field-bolted assembly with close-fitting joints in jambs and mullions, reinforced with splice plates.

1. Continuous Vertical Assemblies: Fabricate units without interrupting blade-spacing pattern unless horizontal mullions are indicated.
2. Horizontal Mullions: Provide horizontal mullions at joints where indicated.

C. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

D. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

1. Frame Type: Channel, unless otherwise indicated.

E. Include supports, anchorages, and accessories required for complete assembly.

F. Provide vertical mullions of type and at spacings indicated, but not more than recommended by manufacturer, or 72 inches (1830 mm) o.c., whichever is less.

G. Where indicated, provide subsills made of same material as louvers for recessed louvers.

H. Join frame members to each other and to fixed louver blades with fillet welds, threaded fasteners, or both, as standard with louver manufacturer, concealed from view, unless otherwise indicated or size of louver assembly makes bolted connections between frame members necessary.

2.4 FIXED, EXTRUDED-ALUMINUM LOUVERS

A. Horizontal Storm-Resistant Louver:

1. Basis-of-Design Product: Construction Specalties, Model RS-7305 or a comparable product of one of the manufacturers listed in Section 2.1.
2. Louver Depth: 4 inches (100 mm) and 7 inches (175 mm).
3. Frame and Blade Nominal Thickness: As required to comply with structural performance requirements, but not less than 0.060 inch (1.5 mm) for blades and 0.080 inch (2.0 mm) for frames.
4. Performance Requirements:

    a. Free Area: Not less than 7.0 sq. ft. (0.65 sq. m) for 48-inch- (1.2-m-) wide by 48-inch- (1.2-m-) high louver.
    b. Air Performance: Not more than 0.10-inch wg (25-Pa) static pressure drop at 600-fpm (3.0-m/s) free-area velocity.
    c. Wind-Driven Rain Performance: Not less than 95 percent effectiveness when subjected to a rain fall rate of 3 inches (75 mm) per hour and a wind speed of 29 mph (13 m/s) at a core area intake velocity of 300 fpm (1.5 m/s).

5. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.5 LOUVER SCREENS

A. General: Provide screen at each exterior louver.

1. Screen Location for Fixed Louvers: Interior face.
2. Screening Type: Insect screening.

B. Secure screens to louver frames with stainless-steel machine screws, spaced a maximum of 6 inches (150 mm) from each corner and at 12 inches (300 mm) o.c.

C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.

1. Metal: Same kind and form of metal as indicated for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.
2. Finish: Mill finish, unless otherwise indicated.
3. Type: Rewirable frames with a driven spline or insert for securing screen mesh.

D. Louver Screening for Aluminum Louvers:

1. Insect Screening: Stainless steel, 18-by-18 (1.4-by-1.4-mm) mesh, 0.009-inch (0.23-mm) wire.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish louvers after assembly.

2.7 ALUMINUM FINISHES

A. Finish designations prefixed by AA comply with system established by the Aluminum Association for designating aluminum finishes.

B. Class I, Color Anodic Finish: AA-M12C22A42/A44 (Mechanical Finish: nonspecular as fabricated; Chemical Finish: etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker) complying with AAMA 611.

1. Color: As selected by Architect from the full range of industry colors and color densities.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.3 INSTALLATION

A. Locate and place louvers and vents level, plumb, and at indicated alignment with adjacent work.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Form closely fitted joints with exposed connections accurately located and secured.

D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated.

E. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.

F. Protect galvanized and nonferrous-metal surfaces from corrosion or galvanic action by applying a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry, or dissimilar metals.

G. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Division 7 Section "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

A. Clean exposed surfaces of louvers and vents that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate until final cleaning.

B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.

C. Restore louvers and vents damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 10200

SECTION 10350 - FLAGPOLES

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 ground-set flagpoles made from aluminum.

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide flagpole assemblies, including anchorages and supports, capable of withstanding the effects of wind loads as determined according to the building code in effect for this project or NAAMM FP 1001, "Guide Specifications for Design of Metal Flagpoles," whichever is more stringent.

1. Base flagpole design on maximum standard-size flag suitable for use with flagpole or flag size indicated, whichever is more stringent.
2. Basic Wind Speed: 100 mph (45 m/s); 3-second gust speed at 33 feet (10 m) aboveground.

1.4 SUBMITTALS

A. Product Data: For each type of flagpole required.

B. Finish Samples for Verification: For each finished material used for flagpoles and accessories.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain each flagpole as a complete unit, including fittings, accessories, bases, and anchorage devices, from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. General: Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. American Flagpole; a Kearney-National Inc. Company.
2. Concord Industries, Inc.

2.2 FLAGPOLES

A. Flagpole Construction, General: Construct flagpoles in one piece if possible. If more than one piece is necessary, comply with the following:

1. Fabricate shop and field joints without using fasteners, screw collars, or lead caulking.
2. For tapered flagpoles, provide flush hairline joints using self-aligning, snug-fitting, internal sleeves.

B. Exposed Height: 35 feet (10.7 m).

C. Aluminum Flagpoles: Provide cone-tapered flagpoles fabricated from seamless extruded tubing complying with ASTM B 241/ (B 241M), Alloy 6063, with a minimum wall thickness of 3/16 inch (4.8 mm). Heat treat after fabrication to comply with ASTM B 597, Temper T6.

D. Foundation Tube: Galvanized corrugated-steel foundation tube, 0.064-inch- (1.6-mm-) minimum nominal wall thickness. Provide with 3/16-inch (4.8-mm) steel bottom plate and support plate; 3/4-inch- (19-mm-) diameter, steel ground spike; and steel centering wedges all welded together. Galvanize steel parts, including foundation tube, after assembly. Provide loose hardwood wedges at top of foundation tube for plumbing pole.

1. Provide flashing collar of same material and finish as flagpole.

2.3 FITTINGS

A. Finial Ball: Manufacturer's standard flush-seam ball, sized as indicated or, if not indicated, to match flagpole-butt diameter.

1. 0.063-inch (1.6-mm) spun aluminum**,** finished to match flagpole.

B. Internal Halyard, Cam Cleat System: 5/16-inch- (8-mm-) diameter, braided polypropylene halyard; cam cleat; and concealed revolving truck assembly with plastic-coated counterweight and sling. Provide flush access door secured with cylinder lock. Finish truck assembly to match flagpole.

C. Halyard Flag Snaps: Provide two chromium-plated bronze swivel snap hooks per halyard.

2.4 MISCELLANEOUS MATERIALS

A. Concrete: Comply with requirements in Division 3 Section "Cast-in-Place Concrete" for normal-weight, air-entrained, ready-mix concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa, unless otherwise indicated.)

B. Sand: ASTM C 33, fine aggregate.

C. Elastomeric Joint Sealant: Single-component neutral-curing silicone joint sealant complying with requirements in Division 7 Section "Joint Sealants" for Use NT (nontraffic) and for Use M, G, A, and, as applicable to joint substrates indicated, O joint substrates.

2.5 FINISHES

A. Metal Finishes, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Aluminum: Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

1. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20; and seal aluminum surfaces with clear, hard-coat wax.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare uncoated metal flagpoles that are set in foundation tubes by painting below-grade portions with a heavy coat of bituminous paint.

B. Foundation Excavation: Excavate to neat clean lines in undisturbed soil. Remove loose soil and foreign matter from excavation and moisten earth before placing concrete.

C. Provide forms where required due to unstable soil conditions and for perimeter of flagpole base at grade. Secure and brace forms and foundation tube, sleeve, or anchor bolts in position, to prevent displacement during concreting.

D. Place concrete immediately after mixing. Compact concrete in place by using vibrators. Moist-cure exposed concrete for not less than seven days or use nonstaining curing compound.

3.2 FLAGPOLE INSTALLATION

A. General: Install flagpoles where shown and according to manufacturer's written instructions.

B. Foundation-Tube Installation: Install flagpole in foundation tube, seated on bottom plate between steel centering wedges. Plumb flagpole and install hardwood wedges to secure flagpole in place. Place and compact sand in foundation tube and remove hardwood wedges. Seal top of foundation tube with a 2-inch (50-mm) layer of elastomeric joint sealant and cover with flashing collar.

END OF SECTION 10350

SECTION 10431 - SIGNS

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. Dimensional characters (letters and numbers) for exterior use.
2. Cast-metal plaques.
3. Signage accessories.

1.3 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of sign.

B. Shop Drawings: Include plans, elevations, and large-scale sections of typical members and other components. Show mounting methods, grounds, mounting heights, layout, spacing, reinforcement, accessories, and installation details.

1. Provide message list for each sign, including large-scale details of wording, lettering, artwork, and layout.

C. Samples for Initial Selection: For each type of sign material indicated that involves color selection.

D. Samples for Verification: For each type of sign, include the following Samples to verify color selected:

1. Dimensional Characters: Full-size Samples of each type of dimensional character (letter and number) required. Show character style, material, finish, and method of attachment.
2. Casting: Show representative texture, character style, spacing, finish, and method of attachment.
3. Approved samples will not be returned for installation into Project.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative of signage manufacturer for installation and maintenance of units required for this Project.

B. Source Limitations: Obtain each sign type through one source from a single manufacturer.

1.5 PROJECT CONDITIONS

A. Field Measurements: Where sizes of signs are determined by dimensions of surfaces on which they are installed, verify dimensions by field measurement before fabrication and indicate measurements on Shop Drawings.

1.6 COORDINATION

A. For signs supported by or anchored to permanent construction, advise installers of anchorage devices about specific requirements for placement of anchorage devices and similar items to be used for attaching signs.

1. For signs supported by or anchored to permanent construction, furnish templates for installation of anchorage devices.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 DIMENSIONAL CHARACTERS

A. Manufacturers:
1. A.R.K. Ramos.
2. ASI Sign Systems, Inc.
3. Gemini Incorporated.
4. Metal Arts; Div. of L&H Mfg.

B. Aluminum Castings: Provide aluminum castings of alloy and temper recommended by sign manufacturer for casting process used and for type of use and finish indicated.

C. Cast Characters: Form individual letters and numbers by casting. Produce characters with smooth flat faces, sharp corners, and precisely formed lines and profiles, free from pits, scale, sand holes, and other defects. Cast lugs into back of characters and tap to receive threaded mounting studs. Comply with requirements indicated for finish, style, and size.

1. Material: Aluminum.

2. Style: Helvetica Medium – Upper and Lower Case as shown on drawings

3. Size: 12” letter – Upper case

2.3 CAST-METAL PLAQUES

A. General: Provide castings free from pits, scale, sand holes, and other defects. Comply with requirements specified for metal, border style, background texture, and finish and in required thickness, size, shape, and copy.

B. Manufacturers:

1. A.R.K. Ramos.
2. ASI Sign Systems, Inc.
3. Gemini Incorporated.
4. Metal Arts; Div. of L&H Mfg.

C. Bronze Castings: ASTM B 584, alloy UNS No. C83600 (No. 1 manganese bronze).

D. Border Style: Raised flat band

E. Background Texture: Manufacturer's standard leatherette finish.

F. Mounting: Rosettes and fasteners matching plaque finish for substrates encountered.

G. Size of Plaque: 12” x 18” overall - Sign text to include the School Board Members, Superintendent, CSRS / The Facility Group, Architect, Engineers and General Contractor.

2.4 ACCESSORIES

A. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.

2.5 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 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 range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within range of approved Samples and are assembled or installed to minimize contrast.

2.6 ALUMINUM FINISHES

A. Baked-Enamel Finish: Manufacturer's standard baked enamel complying with paint manufacturer's written instructions for cleaning, conversion coating, and painting.

1. Color: As selected by Architect from manufacturer's full range.

2.7 COPPER-ALLOY FINISHES

A. Cast-Bronze Plaque Finishes: Exposed surfaces free from porosity, burrs, and rough spots; with returns finished with fine-grain air blast.

1. Raised Areas: Hand-tool and buff borders and raised copy to produce manufacturer's standard satin finish.
2. Background Finish: Dark oxidized.

B. Clear Protective Coating: Coat exposed surfaces of copper alloys with manufacturer's standard clear organic coating specially designed for coating copper-alloy products.

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 work.

B. Verify that items**,** including anchor inserts, provided under other sections of Work are sized and located to accommodate signs.

C. Examine supporting members to ensure that surfaces are at elevations indicated or required to comply with authorities having jurisdiction and are free from dirt and other deleterious matter.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General: Locate signs and accessories where indicated, using mounting methods of types described and in compliance with manufacturer's written instructions.

1. Install signs level, plumb, and at heights indicated, with sign surfaces free from distortion and other defects in appearance.

B. Dimensional Characters: Mount characters using standard fastening methods recommended in writing by manufacturer for character form, type of mounting, wall construction, and condition of exposure indicated. Provide heavy paper template to establish character spacing and to locate holes for fasteners.

1. Projected Mounting: Mount characters at projection distance from wall surface indicated.

C. Cast-Metal Plaques: Mount plaques using standard fastening methods recommended in writing by manufacturer for type of wall surface indicated.

1. Face Mounting: Mount plaques using exposed fasteners with rosettes attached through face of plaque into wall surface.

3.3 CLEANING AND PROTECTION

A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION 10431

SECTION 10505 - METAL LOCKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Corridor Lockers, Double tier (Type I).
2. Athletic Lockers, Single tier (Type II).
3. P. E. Lockers, Multiple-tier box (Type IV).
4. Personnel Locker, Single tier (Type V).
5. Benches.

B. Manufacturers listed in specifications as well as other manufacturers attempting to be prior approved shall submit full size sample of locker prior to bidding. Only approved samples shall be consider as approved products for bidding.

1.3 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of locker and bench.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.

1. Show locker fillers, trim, base, sloping tops, and accessories. Include locker-numbering sequence.

C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for units with factory-applied color finishes.

D. Samples for Verification: Manufacturer's standard sizes, showing the full range of color, texture, and pattern variations expected. Prepare Samples from the same material to be used Lockers.

E. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain locker units and accessories through one source from a single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver lockers until spaces to receive them are clean, dry, and ready for locker installation.

B. Protect lockers from damage during delivery, handling, storage, and installation.

C. Deliver master keys, control keys, and combination control charts to Owner.

1.6 COORDINATION

A. Coordinate size and location of concrete bases. Concrete, reinforcement, and formwork requirements are specified in Division 3 Section "Cast-in-Place Concrete."

1.7 WARRANTY

A. Locker manufacturer shall warrant the lockers for the LIFETIME use of the original purchaser from date of shipment. Warranty shall include all defects in material and workmanship, excluding finish, vandalism, and improper installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products by one of the following:

1. DeBourgh Manufacturing Co.
2. List Industries, Inc.

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 366/A 366M, matte finish, suitable for exposed applications, and stretcher leveled or roller leveled to stretcher-leveled flatness.

B. Expanded Metal: ASTM F 1267, Type II (flattened), 3/4-inch (19-mm) mesh, minimum 0.0747 inch (1.90 mm) thick, with at least 70 percent open area.

C. Galvanized Steel Sheet: ASTM A 653/A 653M, commercial quality, G60 (Z180) coating designation; mill phosphatized; suitable for exposed applications, and stretcher leveled or roller leveled to stretcher-leveled flatness.

D. Electrolytic Zinc-Coated Steel Sheet: ASTM A 591/A 591M, commercial quality, coating Class C; mill phosphatized; suitable for exposed applications; and stretcher leveled or roller leveled to stretcher-leveled flatness.

E. Stainless-Steel Sheet: ASTM A 666, Type 304, stretcher-leveled standard of flatness. Roller-apply texture to doors in manufacturer's standard pattern.

F. Fasteners: Zinc- or nickel-plated steel, slotless-type exposed bolt heads, and self-locking nuts or lock washers for nuts on moving parts.

2.3 CORRIDOR LOCKER – **TYPE I** AND PERSONNEL LOCKERS – **TYPE V**

A. Size:

1. Corridor lockers (Type I) shall be double tier lockers; Width: 12", Depth: 15", Overall Height: 72", Opening Height: 36", Tiers: 2

2. Personnel lockers (Type V) shall be single tier locker; Width: 12”, Depth: 15”, Overall Height; 72”, Opening Height: 72”.

B. Construction: Locker shall be welded at seams and joints and all exposed welds sanded smooth. No bolts, screws or rivets shall be used in assembly of main locker units.

C. Tops, Bottoms, And Tier Dividers: Shall be made of solid 16-gauge cold rolled sheet steel free of surface imperfections.

D. Backs: Shall be made of 18-gauge cold rolled sheet steel free of surface imperfections.

E. Frames: Shall be made of continuous 1"x1"x1/8" pickled angle iron steel.

F. Sides And Intermediate Partitions: Shall be constructed from 1"x1"x1/8" pickled steel angle with panels of 16 Ga. cold rolled sheet steel securely welded to the14 GA. angle iron frame at intervals not to exceed 6".

G. Doors: Provide 14 Ga. cold rolled sheet steel formed doors with double return on vertical sides and single return on horizontal sides. An 18 Ga. stiffener panel must be securely welded to the right side of the door and run top to bottom. Stiffener panel provided to reduce sound and maximize door stiffness to prevent forced entry. Door to be louvered.

H. Latching Mechanism: Single Point Latch: Provide an unbreakable stationary 11 Ga., unbreakable latch, ribbed for additional strength, and welded securely to locker frame extending no more than 1-1/4" into the locker opening and penetrating through a flush mounted recessed stainless steel cup. Latching catch to be no less than 1" in height and supported by a 3/4" x 5/8" tab to help prevent forced entry, and also connected to a through-door hasp of all one-piece construction. Latch and cup assembly shall be capable of accepting either padlock or built-in lock.

I. Hinges: Doors shall be hinged on right side with 3", five knuckle, 14 Ga. fast pin heavy-duty butt hinges. Provide three hinges on each single tier door, and two hinges on each double and multi-tier door. Hinges shall be welded to both door and locker frame. Hinges not welded to both door and locker frame will not be acceptable.

J. Hooks: Provide two single wall hooks and one double ceiling hook in each locker opening. Hooks to be of forged steel with ball ends and zinc plated.

K. Number Plates: Provide one aluminum number plate, located near center of each locker door, with 3/8" black filled number in sequence as directed.

L. Closed Base: Provide a 4" high, 14 Ga. welded steel base enclosed on all four sides, securely welded to locker bottom.

M. Filler/Trim: 18-gauge solid sheet steel used in void areas, painted to match the frame color of the adjacent locker.

2.4 ATHLETIC LOCKER – **TYPE II**

A. Size: Standard Width: 15”, Standard Depth: 15”, Overall Height: 72”, Opening Height: 72”, Tiers: 2

B. Construction: Locker shall be welded at seams and joints and all exposed welds sanded smooth. No bolts screws or rivets shall be used in assembly of main locker units.

C. Tops, Bottoms, And Tier Dividers: Shall be made of solid 16 Ga. Cold rolled sheet steel free of surface imperfections.

D. Shelves: Shall be made of solid 16 Ga. Cold rolled sheet steel free of surface imperfections. Shelf height shall have a minimum clearance of 12”.

E. Backs: Shall be made of 18 Ga. Cold rolled sheet steel free of surface imperfections.

F. Frames: Shall be made of continuous 1” x 1” x 1/8” pickled angle iron steel. Frames that are not one piece, continuous angle iron will not be acceptable.

G. Sides And Intermediate Partitions: Shall be constructed of 1” x 1” x 1/8” angle iron with ¾”, 13 Ga., bond sheared expanded metal permitting 73% ventilation. An additional 13 Ga. Steel handle panel with 16 Ga. Cold rolled steel back panel will be securely welded to the center span of the door. All horizontal mesh edges shall be concealed with an additional steel formation welded to door. Doors that are not one piece, continuous angle iron will not be acceptable.

H. Latching mechanism: 3-point/3 side cremone latching: Provide an unbreakable 11 gauge steel handle welded securely to a three-point cremone type latch mechanism. Latching rods 3/8” in diameter shall engage top and bottom edge of locker frame; a 3/16” thick center latch shall engage locker jamb, enabling door to latch on three sides. Mechanism must be compatible for both padlocks and built-in dead bolt locks and is welded to the door for maximum durability.

I. Hinges: Doors shall be hinged on right side with 3” five knuckle, 14 Ga. Fast pin heavy-duty butt hinges. Provide three hinges on each single tier door. Hinges shall be welded to door and locker frame. Hinges that are not welded to both the door and locker frame will not be acceptable.

J. Hooks: Provide two single wall hooks and one double ceiling hook in each locker opening. Openings 24” wide shall have three single wall hooks and one double ceiling hook. Hooks to be of forged steel with ball ends and zinc plated.

K. Number Plates: Provide one aluminum number plate, located near center of each locker door, with 3/8” black filled number in sequence as directed.

L. Closed Base: Provide a 4” high, 14 Ga. welded steel base enclosed on all four sides, securely welded to locker bottom.

M. Solid End Panels: 16 Ga. solid sheet steel used in void areas, painted to match the frame color of the adjacent locker.

2.5 P. E. GYM LOCKERS – **TYPE IV**

A. General: Lockers shall 6 tier/2tier/6tier combination lockers with 12” x 12” x 12” 6 tier box locker and 12” x 12” x 36” double tier locker.

B. Double tier locker:

1. Size: Width - 12”, Depth - 12" , Overall Height: 72" , Opening Height: 36", Tiers: 2
2. Construction: Locker shall be welded at seams and joints and all exposed welds sanded smooth. No bolts, screws or rivets shall be used in assembly of main locker units.
3. Tops, Bottoms, And Tier Dividers: Shall be made of solid 16-gauge cold rolled sheet steel free of surface imperfections.
4. Backs: Shall be made of 18-gauge cold rolled sheet steel free of surface imperfections.
5. Frames: Shall be made of continuous 1"x1"x1/8" pickled angle iron steel. Frames that are not one piece, continuous angle iron will not be acceptable.

6. Sides And Intermediate Partitions: Shall be constructed with 13 Ga. 3/4" flattened expanded metal securely welded to a 14 gauge angle iron frame at intervals not to exceed 6". All expanded metal edges will be bond sheared to prevent snags or cuts.

7. Doors With Angle Iron Frame: Shall be constructed of 1"x1"x1/8" angle iron with 3/4",diamond perforated insert, permitting 37% ventilation. An additional 13 Ga. steel handle panel with 16 Ga. cold rolled steel back panel will be securely welded to the center span of the door. All horizontal mesh edges shall be concealed with an additional steel formation welded to door. Doors that are not one piece, continuous angle iron will not be acceptable.

8. Latching Mechanism: Provide an unbreakable steel handle welded securely to a three-point cremone type latch mechanism. Latching rods 3/8" in diameter shall engage top and bottom edge of locker frame; a 3/16" thick center latch shall engage locker jamb, enabling door to latch on three sides. Mechanism must be compatible for both padlocks and built-in dead bolt locks and is welded to the door for maximum durability.

9. Hinges: Doors shall be hinged on right side with 3" five knuckle, 14 Ga. fast pin heavy-duty butt hinges. Provide two hinges on each double and multi-tier door. Hinges shall be welded to both door and locker frame. Hinges that are not welded to both the door and locker frame will not be acceptable.

10. Hooks: Provide two single wall hooks and one double ceiling hook in each locker opening. Hooks to be of forged steel with ball ends and zinc plated.

11. Number Plates: Provide one aluminum number plate, located near center of each locker door, with 3/8" black filled number in sequence as directed.

12. Closed Base: Provide a 4" high, 14 Ga. welded steel base enclosed on all four sides, securely welded to locker bottom.

13. Solid End Panels: 16 Ga. solid sheet steel panels shall be welded to frame at the factory on all units adjacent to a void area or with exposed ends. Welds not to exceed 6" intervals.

14. Filler: 18 Ga. solid sheet steel used in void areas, painted to match the frame color of the adjacent locker.

C. 6 Tier Box Locker

1. Size: Width: 12", Depth: 12", Overall Height: 72", Opening Height: 12", Tiers: 6

2. Construction: Locker shall be welded at seams and joints and all exposed welds sanded smooth. No bolts, screws or rivets shall be used in assembly of main locker units.

3. Tops, Bottoms, And Tier Dividers: Shall be made of solid 16 Ga. Cold rolled sheet steel free of surface imperfections and capable of taking a high grade pure polyester powder coat finish or baked on enamel finish.

4. Backs: Shall be made of 18 Ga. cold rolled sheet steel free of surface imperfections and capable of taking a high-grade pure polyester powder coat finish or baked on enamel finish.

5. Frames: Shall be made of continuous 1"x1"x1/8" pickled angle iron steel. Frames that are not one peice, continious angle iron will not be acceptable.

6. Sides And Intermediate Partitions: Shall be constructed with 13 Ga. 3/4" flattened expanded metal securely welded toA 14 Guage angle iron frame at intervals not to exceed 6". All expanded metal edges will be bond sheared to prevent snags or cuts.

7. Doors: Provide 14 Ga. cold rolled sheet steel formed doors with a single return on horizontal sides and hinge side. Form the latch side of the door to provide continuous

door strike at frame. Hinge side shall have hinge pin securely welded to door. Doors to be diamond perforated.

8. Box Locker Spring Latch: Shall be constructed of 16 Ga. cold rolled steel, bright zinc plated with 10 Ga. latch and 16 Ga. stainless steel lock hasp. Completely enclosed stainless steel spring. Assembled using 6 nickel plated rivets.

9. Box Locker Side Hinge: Box locker style doors shall be hinged on the right side by one piece 3/16" minimum diameter hinge pin securely welded to door and bearing in two solid brass bushed 16 Ga. knife hinges secured to locker body by no less than four rivets.

10. Number Plates: Provide one aluminum number plate, located near center of each locker door, with 3/8" black filled number in sequence as directed.

11. Closed Base: Provide a 4" high, 14 ga. welded steel base enclosed on all four sides, securely welded to locker bottom.

12. Filler/Trim: 18 Ga. solid sheet steel used in void areas, painted to match the frame color of the adjacent locker.

13. Solid End Panels: 16 Ga. solid sheet steel panel shall be welded to frame at the factory on all units adjacent to a void area or with exposed ends. Welds not to exceed 6" intervals.

2.6 LOCKER BENCHES

A. General: Provide locker benches fabricated by same manufacturer as metal lockers.

B. Bench Tops: Manufacturer's standard 1-piece units, of the following material, minimum 9-1/2 inches (240 mm) wide by 1-1/4 inches (32 mm) thick, with rounded corners and edges:

1. Laminated maple with one coat of clear sealer on all surfaces, and one coat of clear lacquer on top and sides.

C. Fixed Pedestals: Manufacturer's standard supports, with predrilled fastener holes for attaching bench top and anchoring to floor, complete with fasteners and anchors, and as follows:

1. Cast Iron: 1-1/2-inch- (38-mm-) diameter steel tubing threaded on both ends, with standard pipe flange at top and bell-shaped cast-iron base; with baked-enamel or powder-coat finish; anchored with exposed fasteners.

a. Color: As selected by Architect from manufacturer's full range.

2.7 FABRICATION

A. Unit Principle: Fabricate each locker with an individual door and frame, individual top, bottom, back, and shelves, and common intermediate uprights separating compartments.

B. All-Welded Construction: Preassemble lockers by welding all joints, seams, and connections, with no bolts, screws, or rivets used in assembly. Grind exposed welds flush.

C. Fabricate lockers square, rigid, and without warp, 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, one-piece assembly.

1. Form locker-body panels, doors, shelves and accessories from one-piece steel sheet, unless otherwise indicated.

2.8 FINISHES, GENERAL

A. Finish all steel surfaces and accessories, except prefinished stainless-steel and chrome-plated surfaces.

B. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

D. 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.

2.9 STEEL SHEET FINISHES

A. Surface Preparation: Clean surfaces of dirt, oil, grease, mill scale, rust, and other contaminants that could impair paint bond. Use manufacturer's standard methods.

B. At Contractors option, provide one of the following finishes:

1. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard baked-enamel finish consisting of a thermosetting topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 1.4 mils (0.036 mm) on doors, frames, and legs, and 1.1 mils (0.028 mm) elsewhere.

2. Powder-Coated Finish: Immediately after cleaning and pretreating, electrostatically apply manufacturer's standard baked-polymer finish consisting of a thermosetting powder topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils (0.05 mm).

a. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine concrete bases for suitable conditions where metal lockers are to be installed.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install metal lockers and accessories level, plumb, rigid, and flush according to manufacturer's written instructions.

B. Connect groups of all-welded lockers together with standard fasteners, with no exposed fasteners on face frames.

C. Anchor lockers to floors and walls at intervals recommended by manufacturer, but not more than 36 inches (910 mm) o.c. Install anchors through backup reinforcing plates where necessary to avoid metal distortion, using concealed fasteners.

D. Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.

1. Attach sloping top units to lockers, with closures at exposed ends.

3.3 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust doors and latches to operate easily without binding. Verify that integral locking devices operate properly.

B. Clean interior and exposed exterior surfaces and polish stainless-steel and nonferrous-metal surfaces.

C. Protect lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit locker use during construction.

D. Touch up marred finishes, or replace locker units that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by locker manufacturer.

END OF SECTION 10505

SECTION 10520 - FIRE-PROTECTION SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Portable fire extinguishers.
2. Fire-protection cabinets Portable fire extinguishers.
3. Mounting brackets for fire extinguishers.

1.3 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fire-protection specialties.

1. Fire Extinguishers: Include rating and classification.
2. Cabinets: Include roughing-in dimensions, details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type, trim style, and panel style.

B. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available for each type of cabinet finish indicated.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain fire extinguishers and cabinets through one source from a single manufacturer.

B. NFPA Compliance: Fabricate and label fire extinguishers to comply with NFPA 10, "Standard for Portable Fire Extinguishers."

C. Fire Extinguishers: Listed and labeled for type, rating, and classification by an independent testing agency acceptable to authorities having jurisdiction.

1. Provide extinguishers listed and labeled by FM.

1.5 COORDINATION

A. Coordinate size of cabinets to ensure that type and capacity of fire extinguishers indicated and provided by Owner under separate Contract are accommodated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products from one fo the following manufacturers:

1. Portable Fire Extinguishers:

a. J.L. Industries, Inc.
b. Larsen's Manufacturing Company.
c. Potter-Roemer; Div. of Smith Industries, Inc.

2. Fire-Protection Cabinets:

a. J.L. Industries, Inc.
b. Larsen's Manufacturing Company.
c. Potter-Roemer; Div. of Smith Industries, Inc.

3. Mounting Brackets

a. JL Industries, Inc.
b. Larsen's Manufacturing Company.
c. Potter Roemer; Div. of Smith Industries, Inc.

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: Carbon steel, complying with ASTM A 366/A 366M, commercial quality, stretcher leveled, temper rolled.

2.3 PORTABLE FIRE EXTINGUISHERS

A. General: Provide fire extinguishers of type, size, and capacity for each cabinet and other locations indicated.

B. Multipurpose Dry-Chemical Type: UL-rated 2-A:10:B:C, 5-lb (2.3-kg) nominal capacity, in enameled-steel container.

C. Purple-K Dry-Chemical Type in Aluminum Container: UL-rated 30-B:C, 5-lb (2.3-kg) nominal capacity, with potassium bicarbonate-based dry chemical in enameled-aluminum container.

2.4 FIRE-PROTECTION CABINETS

A. Cabinet Construction: Provide manufacturer's standard box (tub), with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated. Weld joints and grind smooth. Miter and weld perimeter door frames.

1. Fire-Rated Cabinets: Listed and labeled to meet requirements of ASTM E 814 for fire-resistance rating of wall where it is installed.

a. Construct fire-rated cabinets with double walls fabricated from 0.0478-inch- (1.2-mm-) thick, cold-rolled steel sheet lined with minimum 5/8-inch- (16-mm-) thick, fire-barrier material.
b. Provide factory-drilled mounting holes.

2. Cabinet Metal: Enameled-steel sheet.

B. Cabinet Type: Suitable for the following:

1. Fire extinguisher.

C. Cabinet Mounting: Suitable for the following mounting conditions:

1. Semirecessed (Typical): Cabinet box partially recessed in walls of shallow depth to suit style of trim indicated.

2. Provide surface mounted cabinet in gymnasium on precast walls.

D. Cabinet Trim Style: Fabricate cabinet trim in one piece with corners mitered, welded, and ground smooth.

1. Exposed Trim: One-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend).

a. Rolled-Edge Trim: 2-1/2-inch (64-mm) backbend depth.

E. Cabinet Trim Material: Manufacturer's standard, as follows:

1. Same metal and finish as door.

F. Door Material: Manufacturer's standard, as follows:

1. Steel sheet.

G. Door Style: Manufacturer's standard design, as follows:

H. Door Construction: Fabricate doors according to manufacturer's standards, of materials indicated, and coordinated with cabinet types and trim styles selected.

1. Provide minimum 1/2-inch- (13-mm-) thick door frames, fabricated with tubular stiles and rails, and hollow-metal design.

I. Door Hardware: Provide manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide either lever handle with cam-action latch, or exposed or concealed door pull and friction latch. Provide concealed or continuous-type hinge permitting door to open 180 degrees.

2.5 COLORS AND TEXTURES

A. Colors and Textures: As selected by Architect from manufacturer's full range for these characteristics.

2.6 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

D. Cabinet and Door Finishes: Provide manufacturer's standard baked-enamel paint for the following:

1. Exterior of cabinets and doors, except for those surfaces indicated to receive another finish.
2. Interior of cabinets and doors.

2.7 STEEL FINISHES

A. Surface Preparation: Clean surfaces of dirt, oil, grease, mill scale, rust, and other contaminants that could impair paint bond using manufacturer's standard methods.

B. Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard two-coat, baked-enamel finish consisting of prime coat and thermosetting topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils (0.05 mm).

1. Color and Gloss: As selected by Architect from manufacturer's full range.

2.8 MOUNTING BRACKETS

A. Mounting Brackets: Manufacturer's standard galvanized steel, designed to secure fire extinguisher to wall or structure, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.

1. Color: Red.

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: As approved by Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for hose valves, hose racks, and cabinets to verify actual locations of piping connections before cabinet installation.

B. Examine walls and partitions for suitable framing depth and blocking where recessed and semirecessed cabinets are to be installed.

C. Examine fire extinguishers for proper charging and tagging.

1. Remove and replace damaged, defective, or undercharged units.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Comply with manufacturer's written instructions for installing fire-protection specialties.

B. Install in locations and at mounting heights indicated or, if not indicated, at heights acceptable to authorities having jurisdiction.

1. Prepare recesses for cabinets as required by type and size of cabinet and trim style.
2. Fasten cabinets to structure, square and plumb.

3.3 ADJUSTING, CLEANING, AND PROTECTION

A. Adjust cabinet doors that do not swing or operate freely.

B. Refinish or replace cabinets and doors damaged during installation.

C. Provide final protection and maintain conditions that ensure that cabinets and doors are without damage or deterioration at the time of Substantial Completion.

END OF SECTION 10520

SECTION 10530 - EXTRUDED ALUMINUM WALKWAY COVERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS:

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

1.02 DESCRIPTION OF WORK:

A. The extent of aluminum walkway cover is shown on the drawings and as specified herein.

B. Definition: Extruded Aluminum Walkway Cover shall consist entirely of extruded aluminum sections (roll-formed not acceptable). System shall consist of heli-arc welded, one-piece rigid structural bents (column and beam assemblies), decking, fascia, accessory items and hardware to provide a complete system.

C. Water shall drain from deck into designated beams and out at grade level of columns through weepholes.

1.03 SUBMITTALS

A. Shop Drawings: Submit detailed drawings, layout of walkway cover system, bent locations (identify drain columns and wet bents), all mechanical joint locations with complete details, connections, jointing and accessories. Include details of concrete footings and bent anchorage.

B. Product Data: Submit manufacturer's product data, specifications, component performance data and installation instructions.

C. Calculations: Provide signed and sealed structural calculations for the proposed walkway cover, by a professional engineer registered in the state of Louisiana, who professes his discipline to be structural engineering.

1.04 QUALITY ASSURANCE

A. Codes and Standards: Comply with provisions of the following except as otherwise indicated:

Standard Building Code, latest addition with amendments, if any.

AWS (American Welding Society) standards for structural aluminum welding.

B. Manufacturer: Obtain aluminum covered walkway system from only one (1) manufacturer, although several may be indicated as offering products complying with requirements.

C. Installer Qualification: Firm with not less than three (3) years experience in installation of aluminum walkway covers of type, quantity and installation methods similar to work of this section.

D. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible, to insure proper fitting of work. However, allow for adjustments within specified tolerations wherever takingof field measurements before fabrication might delay work.

E. Shop Assembly: Preassemble units in shop to greatest extent possible and disassemble as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

F. Coordination: Coordinate work of this section with work of other sections which interface with covered walkway system (sidewalks, curbs, building fascias, etc.).

1.05 PERFORMANCE REQUIREMENTS:

A. System Performance: Provide aluminum covered walkway system that has been designed, produced, fabricated and installed to withstand normal temperature changes as well as live loading, dead loading and wind loading in compliance with Standard Building Code requirements for geographic area in which work is located and as follows:

Live Load: 30 p.s.f. minimum

Structural design for wind forces: Comply with ANSI A58.1-1982

Design Wind Velocity: 110 m.p.h.

Importance Factor: 1.1.

Stability Criteria: Standard Building Code, Section 1205.3.

B. Sizes shown on drawings are to be considered minimum.

C. Structure shall be capable of sustaining severe icing, hail, hurricane force winds and supporting a concentrated load such as being walked upon.

PART 2 - PRODUCT

2.01 MANUFACTURERS

A. Subject to compliance with these requirements, provide products by one of the following manufacturers:
1) E.L. Burns Company
2) DITT-Deck Extruded Aluminum Walkway Cover System by Dittmer Architectural Aluminum is specified as the standard of quality.
3) Peachtree
4) Nu-Vent

2.02 MATERIALS

A. All aluminum extrusions shall be alloy 6063 heat treated to a T-6 temper.

B. Standard finish for all components shall be clear anodized aluminum.

C. Fasteners:

1. Deck Screws (rivets not permitted): Type 18-8 non-magnetic stainless steel sealed with a neoprene "O" ring beneath 5/8" outside dimension, conical washer.
2. Fascia Rivets: Size 3/16" by 1/2" grip range aluminum rivets with aluminum mandrel.
3. Bolts: All bolts, nuts and washers to be 18-8 non-magnetic stainless steel.
4. Tek Screws: not permitted

D. Warranty:

1. Manufacturer shall warrant the entire system against defects in labor and materials for a period of one (2) years commencing on the date of substantial completion as established in Division One of these specifications.
2. Intention of this warranty is the manufacturer will come onto the jobsite and do all necessary to effect corrections of any deficiencies.
3. Evidence of defects in labor and material may include but is not limited to, one or more of the following:
   a. Moisture leaks
   b. Metal failure including excessive deflection
   c. Fastener failure
   d. Finish failure

2.03 FABRICATION

A. Comply with indicated profiles, dimensioned requirements and structural requirements.

B. Use sections true to details with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture, free from defects impairing strength and durability.

C. All welding do be done by heli-arc process.

D. Bents shall consist of shop welded one piece units. When size of bents do not permit shipment as a welded unit, concealed mechanical joints may be used.

E. Mechanical joints shall consist of stainless steel bolts with a minimum of two (2) bolts per fastening. Bolts and nuts shall be installed in a concealed manner utilizing 1/2" thick by 1 1/2" aluminum bolt bars welded to structural members. All such mechanical joints must be detailed on shop drawings showing all locations.

F. Roof Deck: Extruded Aluminum shapes, interlocking self-flashing sections. Shop fabricate to lengths and panels widths required for field assembly. Depth of sections to comply with structural requirements. Provide shop induced camber in deck units with spans greater than 16'- 0" to offset dead load deflections. Welded dams are to be used at non-draining ends of deck.

G. Expansion joints, design structure for thermal expansion and contraction. Provide expansion joints as required.

H. Exposed rivets used to fasten bottom of fascia to deck to have finish to match fascia.

I. Apply a shop applied dip-coat of clear acrylic enamel to each column end terminating in concrete to insulate from electrolytic reaction. Column ends shall be pierced to "key" grout to bent for maximum uplift protection.

PART 3 EXECUTION

3.01 DELIVERY, STORAGE AND HANDLING:

A. Deliver, store and handle covered walkway system components as recommended by manufacturer. Handle and store in a manner to avoid deforming members and to avoid excessive stresses.

3.02 EXAMINATION

A. Examine adjacent work for conditions that would prevent quality installation of system.

B. Do not proceed until defects are corrected.

3.03 CONCRETE FOOTINGS

A. Concrete footings are not work of this section. Refer to "concrete work", Section 03300.

B. Sleeves (styrofoam blockouts) shall be furnished by walkway cover manufacturer and placed by general contractor. Coordinate block outs at drains through the brick casing around the columns. Refer to drawings.

3.04 FIELD DIMENSIONS

A. General contractor shall field confirm bent locations, dimensions and elevations shown on shop drawings prior to fabrication.

3.05 INSTALLATION

A. Erection: Set roof support frames (bents) into pockets provided in top of footings; set to required elevations, align, plumb and level; and grout in place with 2,000 p.s.i. portland cement grout. Assure that grout fills all voids and "keys" to columns. Fill downspout units with grout to bottom of discharge level. Install aluminum deflectors after grouting. Follow manufacturer's instructions. Match to finish and elevation of adjacent sidewalks.

B. Install roof deck sections, accessories and related flashing in accordance with manufacturer's instructions. Provide roof slope for rain drainage without ponding water. Align and anchor roof deck units to structural support frames.

C. Assemble all components in a neat, workmanlike manner.

3.06 FLASHING

A. Flashings: Flashings required between covered walkway system and adjoining structures are not work of this section. Refer to "Flashing and Sheet Metals" in Division 7.

3.07 CLEANING AND PROTECTION

A. Damaged Units: Replace roof deck panels and other components of the work which have been damaged or have deteriorated beyond successful minor repair.

B. Cleaning: Remove protective coverings at time in project construction sequence, which will afford greatest protection of work. Clean finished surfaces as recommended by manufacturer. Maintain in a clean condition during construction.

C. Protection: Advise Contractor of protection and surveilance procedures, as required to ensure that work of this section will be without damage or deterioration at time of substantial completion.

END OF SECTION 10530

SECTION 10800 - TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Toilet and bath accessories.
2. Warm-air dryers.

1.3 SUBMITTALS

A. Product Data: Include construction details, material descriptions and thicknesses, dimensions, profiles, fastening and mounting methods, specified options, and finishes for each type of accessory specified.

B. Setting Drawings: For cutouts required in other work; include templates, substrate preparation instructions, and directions for preparing cutouts and installing anchoring devices.

C. Maintenance Data: For accessories to include in maintenance manuals specified in Division 1. Provide lists of replacement parts and service recommendations.

1.4 QUALITY ASSURANCE

A. Source Limitations: Provide products of same manufacturer for each type of accessory unit and for units exposed to view in same areas, unless otherwise approved by Architect.

B. Product Options: Accessory requirements, including those for materials, finishes, dimensions, capacities, and performance, are established by specific products indicated in the Toilet and Bath Accessory Schedule.

1. Do not modify aesthetic effects, as judged solely by Architect, except with Architect's approval. Where modifications are proposed, submit comprehensive explanatory data to Architect for review.

1.5 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by disabled persons, proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.6 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Manufacturer's Mirror Warranty: Written warranty, executed by mirror manufacturer agreeing to replace mirrors that develop visible silver spoilage defects within minimum warranty period indicated.

1. Minimum Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide accessories by one of the following:

1. Toilet and Bath Accessories:

a. Bobrick Washroom Equipment, Inc.

b. Bradley Corporation.

2. Warm-Air Dryers:

a. Bobrick Washroom Equipment, Inc.

b. Bradley Corporation.

B. Products: Subject to compliance with requirements, provide one of the products indicated for each designation in the Toilet and Bath Accessory Schedule at the end of Part 3.

2.2 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, with No. 4 finish (satin), in 0.0312-inch (0.8-mm) minimum nominal thickness, unless otherwise indicated.

B. Brass: ASTM B 19, leaded and unleaded flat products; ASTM B 16 (ASTM B 16M), rods, shapes, forgings, and flat products with finished edges; ASTM B 30, castings.

C. Sheet Steel: ASTM A 366/A 366M, cold rolled, commercial quality, 0.0359-inch (0.9-mm) minimum nominal thickness; surface preparation and metal pretreatment as required for applied finish.

D. Galvanized Steel Sheet: ASTM A 653/A 653M, G60 (Z180).

E. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service), nickel plus chromium electrodeposited on base metal.

F. Mirror Glass: ASTM C 1036, Type I, Class 1, Quality q2, nominal 6.0 mm thick, with silvering, electroplated copper coating, and protective organic coating complying with FS DD-M-411.

G. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

H. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.

2.3 FABRICATION

A. General: One, maximum 1-1/2-inch- (38-mm-) diameter, unobtrusive stamped manufacturer logo, as approved by Architect, is permitted on exposed face of accessories. On interior surface not exposed to view or back surface of each accessory, provide printed, waterproof label or stamped nameplate indicating manufacturer's name and product model number.

B. Surface-Mounted Toilet Accessories: Unless otherwise indicated, fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with continuous stainless-steel hinge. Provide concealed anchorage where possible.

C. Recessed Toilet Accessories: Unless otherwise indicated, fabricate units of all-welded construction, without mitered corners. Hang doors and access panels with full-length, stainless-steel hinge. Provide anchorage that is fully concealed when unit is closed.

D. Framed Glass-Mirror Units: Fabricate frames for glass-mirror units to accommodate glass edge protection material. Provide mirror backing and support system that permits rigid, tamper-resistant glass installation and prevents moisture accumulation.

1. Provide galvanized steel backing sheet, not less than 0.034 inch (0.85 mm) and full mirror size, with nonabsorptive filler material. Corrugated cardboard is not an acceptable filler material.

E. Mirror-Unit Hangers: Provide mirror-unit mounting system that permits rigid, tamper- and theft-resistant installation, as follows:

1. One-piece, galvanized steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

B. Secure mirrors to walls in concealed, tamper-resistant manner with special hangers, toggle bolts, or screws. Set units level, plumb, and square at locations indicated, according to manufacturer's written instructions for substrate indicated.

C. Install grab bars to withstand a downward load of at least 250 lbf (1112 N), when tested according to method in ASTM F 446.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

3.3 TOILET AND BATH ACCESSORY SCHEDULE

A. Grab Bar: Provide stainless-steel grab bar complying with the following:

1. Products: Subject to the requirements, provide one of the following:

   a. 6806 Series; Bobrick
   b. Model #812; Bradley

2. Stainless-Steel Nominal Thickness: Minimum 0.05 inch (1.3 mm).
3. Mounting: Concealed with manufacturer's standard flanges and anchors.
4. Gripping Surfaces: Manufacturer's standard slip-resistant texture.
5. Outside Diameter: 1-1/2 inches (38 mm) for heavy-duty applications.

B. Mirror Unit: Provide mirror unit complying with the following:

1. Products: Subject to the requirements, provide one of the following (size shown on drawings):

   a. B-290 series; Bobrick
   b. Model #780; Bradley

2. Stainless-Steel, Angle-Framed Mirror: Fabricate frame from minimal nominal 0.05-inch (1.3mm) stainless-steel angles with square corners, mitered, welded, and ground smooth.
3. Fixed-Tilt, Stainless-Steel-Framed Mirror Unit: Fabricate frame from minimum nominal 0.0375-inch- (0.95-mm-) thick stainless steel, with all joints mitered, welded, and ground smooth and constructed so frame tapers not less than 3 inches (75 mm) from top to bottom.

C. Shower Curtain Rod: Provide stainless-steel shower curtain rod with 3-inch (75-mm) stainless-steel flanges designed for exposed fasteners, in length required for shower opening indicated, and complying with the following:

1. Products: Subject to the requirements, provide one of the following (size shown on drawings):

   a. B-6047; Bobrick
   b. Model #9531; Bradley

2. Heavy-Duty Rod: 1-1/4-inch (32-mm) OD; fabricated from nominal 0.05-inch- (1.3-mm-) thick stainless steel.

D. Shower Curtain: Provide shower curtain complying with the following:

1. Products: Subject to the requirements, provide one of the following (size shown on drawings):

   a. B-204-2; Bobrick
   b. Model #9533; Bradley

2. Vinyl Shower Curtain: Minimum 0.006-inch- (0.15-mm-) thick, opaque, matte vinyl with hemmed edges and corrosion-resistant grommets at minimum 6 inches (152 mm) o.c. through top hem.

    a. Size: Minimum 6 inches (152 mm) wider than opening by 72 inches (1828 mm) high.

    b. Color: As selected by Architect from mfr's full range.

3. Shower Curtain Hooks: Chrome-plated or stainless-steel, spring wire curtain hooks with snap fasteners, sized to accommodate specified curtain rod. Provide one hook per curtain grommet.

E. Folding Shower Seat: Provide heavy-duty hinged seat designed to fold up against wall when not in use with stainless-steel support braces, hinges, frame, and fasteners; of all-welded construction; and complying with the following:

1. Products: Subject to the requirements, provide one of the following:

    a. 5171/5181; Bobrick
    b. Model #9563/9564; Bradley

2. Configuration: L-shaped seat, designed for wheelchair access.
3. Seat Material: Phenolic or polymeric composite of slat type or one-piece construction. Color as selected by Architect from manufacturer’s full color range.

F. Warm-Air Dryer: Provide warm-air dryer complying with the following:

1. Products: Subject to the requirements, provide one of the following:
    a. 2870-28; Bradley

    b. 700; Bobrick

2. Hand Dryer: Surface-mounted, warm-air hand dryer with manufacturers' standard, white-painted metal cover, infrared sensor and timed power cut-off switch.

END OF SECTION 10800

11062 – STAGE RIGGING

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. Valance
2. Main Curtain (Bi-part)
3. Ceiling Borders (Teasers)
4. Legs (Tormentors)
5. Theatrical Rigging (Curtain and Electrics)
6. Rear Curtain

1.3 SUBMITTALS

A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections:

1. Product data, installation instructions, and general recommendations, including data substantiating that materials comply with requirements.
2. Shop drawings including plans, elevations, and detail sections of typical rigging elements. Show anchors, hardware, operating equipment, and other components not included in manufacturer's standard product data.
3. Samples for verification purposes, 12 inches (300 mm) square of each fabric in color indicated and with flameproofing applied (if required).
4. Samples for initial selection purposes in form of fabric manufacturer's standard color card, together with a 12 inch (300 mm) square physical sample (any color) for each fabric required.
5. Product certificates signed by stage curtain fabricator certifying that the products comply with specified requirements.

1.4 SUBSTITUTIONS

A. Refer to Section 01630 Substitutions.

1.5 QUALITY ASSURANCE

A. Fabricator/Installer Qualifications: Firm experienced in producing stage curtains similar to those indicated for this Project that have a record of successful in-service performance, and with sufficient production capacity to produce required units without causing a delay in the Work.

B. Fire-Performance Characteristics: Provide stage curtains that are certified to be flame resistant according to requirements of NFPA 701. Permanently attach label to each curtain indicating whether curtain is permanently and inherently flame resistant, or whether it will require re-treatment after dry cleaning.

1.6 PROJECT CONDITIONS

A. Field Measurements: Check actual stage curtain openings by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying Work.

B. Where field measurements cannot be made without delaying the Work, guarantee opening dimensions and proceed with fabricating stage curtains without field measurements. Coordinate stage construction to ensure that actual opening dimensions correspond to guaranteed dimensions.

PART 2 - PRODUCT

2.1 THEATRICAL RIGGING EQUIPMENT

A. General Standards:

1. Paint as required under this section shall be the manufacturer's standard finish and color except as noted.

2. All equipment items shall be new and conform with applicable provisions of Underwriters' Laboratories and American Standards Association.

3. Where acceptable equipment items are specified by catalog number only, device shall meet all published manufacturer's specifications. Where quantities are not given, refer to drawings.

B. General Rigging Standards:

1. All turnbuckles, clips, tracks, chains and other items of incidental hardware shall be furnished plated or painted. Wire rope shall be galvanized. Fasteners, chain, and other miscellaneous hardware shall be either cadmium or zinc plated.

2. All materials used in this project shall be new, unused and of the latest design. Refurbished materials are not permitted.

3. In order to establish minimum standards of safety, a minimum factor of 8 shall be used for all equipment and hardware used on this project. In addition, the following factors shall be used:

a. Cables and fittings: 8 Safety Factor

b. Cable bending ratio: 30 times diameter

c. Tread pressures: 500 lbs. for cast iron

d. 1000 lbs. for steel

e. Bearings: Two times required load at full for 2000 hours

2.2 CABLES AND FITTINGS

A. All cables unless otherwise noted shall be 7 x 19 construction, galvanized aircraft cable with a breaking strength of 7000 lbs.

B. Damaged of deformed cable shall not be used.

C. Cable fittings and clips shall conform with wire rope manufacturer's recommendations as to size, number, and method of installation.

D. Clips shall be drop forged "Crossby" or "Malleable".

E. There shall be two cable clips for each batten support line tie-off.

F. Pressed sleeve fittings shall be Nicopress.

G. Eyes shall be formed over wire rope thimbles of correct sizes.

H. All wire rope rigging shall be installed so as to prevent abrasion or rubbing of the wire rope against any part of the building construction or other equipment.

2.3 TRIM CHAINS

A. Trim chains shall be 1/4" grade 30 proof coil chain 30" long with a 1/4" threaded chain connector (French link) on one end.

B. The threaded connector shall be rated at not less than 800 lbs. capacity and shall have the rating stamped on each unit.

C. Chains shall be installed on batten end of each batten support line.

2.4 PIPE BATTENS

A. Pipe battens shall be 1-1/2" in diameter schedule 40 pipe.

B. All battens shall be painted black to prevent rusting.

C. Where splicing is required, a pin, 18" long and the same diameter as the inside diameter as the pipe shall be used. This pin shall be held in place with no less than four (4) rivets.

D. Mark the center of each batten with a 1" wide yellow stripe

E. Paint the last 3'0" of each end of each pipe batten yellow.

2.5 PIVOT

A. Provide pivot device with indexing plate and break kit for legs (tormentors) as shown on the Drawings.

2.6 LIGHT LADDER – TYPE LL

A. Three (3) 24" rungs on 24" centers with single swivel type heavy duty pipe clamp, all finished black enamel.

B. Acceptable product or approved equal:

1. 2 ea. Altman 263 or SSRC 3-rung ladder fabricated with single swivel pipe clamp.

2.7 TORMENTOR PIPES

A. Tormentor pipes fabricated from 1-1/2" schedule 40 pipe, welded construction finished black matte complete with 18" arms with pipe clamps and tees as shown on the Drawings.

B. Acceptable product or approved equal:

1. Secoa TP or SSRC TP series tormentor pipe with arms as shown on the Drawings.

2.8 SPECIAL COMPONENTS

A. Where such special requirements are necessary, they will be furnished as standard parts of this equipment without claim by the Contractor for additional compensation.

2.9 STAGE CURTAINS

A. Fabrics:

1. Front and Rear Curtain, Valance, Borders, and Legs: Provide 22 ounce Encore Synthetic Velour.

B. Flameproofing:

1. Fabrics used in fabrication of draperies shall be chemically flameproof with a formula approved Bureau of Standards U.S. Department of Commerce, and finished fabric, after treatment, shall pass such tests as are required by applicable codes and ordinances.

2. Certificate shall state name of Stage Equipment Contractor, name of firm doing flameproofing treatment, date of treatment, date re-treatment will be required, method of treatment, and the certificate shall be affixed the signature of an officer or authorized representative of the firm furnishing the draperies.

C. Fabrication Of Standard Stage Draperies:

1. Sew fabrics with box-pleats to 3-1/2" wide heavy-duty upholstery jute webbing, pleats spaced 12" on centers, unless otherwise specified. Use mercerized cotton thread, minimum weight #16, color to match cloth shall be full length and shall be without splices for entire length of the curtain.

2. Properly join panels smooth and free of puckering at seams, hems, and turnbacks.

3. Where completed curtains are to be operated on a traveler track, equip each pleat with a 2" plated harness snaphook mounted to curtain by means of a strap of web-belting to curtain by riveting with not less than 2 tubular rivets per snaphook. Web-belting straps shall pass over front and back sides of pleats, and rivets shall go completely through the

web-belting, jute webbing, and all thickness of curtain fabric. Canvas straps, leather straps, grommets and s-hooks, cotter key hooks, etc., shall not be acceptable.

4. Where completed curtains are to be tied to a pipe batten, each pleat shall be equipped with a 30" long #4 braided nylon tieline through a No. 2, or larger brass grommet, each to be on 12" centers located in the box pleats at the webbing.

5. Bottom hems of all curtains shall be 5" and shall be equipped with a separate canvas pocket sewn inside bottom hems in such manner as to have the bottom of the canvas pocket at least 1-1/2" above bottom of curtain hem. Load canvas pocket with #6 galvanized pump chain, secured to prevent bunching and shifting within the pocket.

6. Off-stage vertical hems and center-facing turnbacks of the front curtain and mid-stage shall be one-half width (27") of material faced back and no sewn hem shall be permitted within these hems. Vertical hems of all masking borders, travelers, and cyclorama curtains shall be 6".

7. Finish curtains properly in the best manner and method of the industry, and after hanging, thoroughly brush to remove dust, visible dirt, loose threads, loose fabric lint, etc. Wrinkles shall be allowed to fall our naturally.

8. Fullness desired for each panel of curtains is indicated by the number of widths specified for each item. Any number of widths less than the number specified will result in re-fabrication of curtains.

D. Acceptable Product:

1. KM Fabric

2. Frankel Associates

3. Rose Brand

4. Approved equal.

2.10 CURTAIN TRAVELER TRACKS

A. Components:

1. Track shall be 14 gauge galvanized steel, roll-formed to 2-5/8" wide x 2-3/4" high channel with continuous slot in bottom.

2. Suspend track on 7' maximum centers with two-piece clamp hanger formed from 11 gauge steel. Provide 2' overlap at center, rigidly separated by two overlap clamps. Install end stop with cord support at each track end. Where lengths exceed 26', connect tracks with 12" long, two-piece splicing clamp of 12 gauge steel.

3. Provide single carriers, spaced on 12" centers, constructed of two neoprene-tired ball bearing wheels fastened parallel to black Super Tough nylon carrier body. Supply with heavy-duty hooks, swivel eye and trim chain for attachment of curtain. Install rear fold guide and two round neoprene bumpers between each carrier to fold curtain at offstage edges and minimize noise.

4. Master carriers shall be 4-wheel neoprene-tired ball bearing assemblies with bodies formed from 11-gauge steel. Connect to operating line with two formed steel cord clamps

attached to each body. Supply each master carrier with two heavy-duty hooks, swivel eyes, and trim chains for attachment of leading edge of curtain.

5. Single and double end pulleys shall clamp securely to the underside of the track channel, and shall be equipped with 8" diameter Nylatron GS sheaves grooved for ½" operating line. Install two 5/8" sealed precision ball bearings in each sheave. Lock shaft to side plate on head end with 3/16" keeper pin to prevent rotation and install fine-threaded nylon insert lock nut.

6. Provide floor block in 12 gauge steel housing containing 8" Nylatron sheave with two 3/8" sealed precision ball bearings. Sheave axle shall lock at any point within 9" vertical slots to allow tension adjustment of operating line.

7. Provide pivot device with indexing plate and break kit for legs (tormentors).

8. Black operating line shall be ½" diameter, stretch-resistant rope with spun polyester outer jacket double braided over solid polyester core.

9. Provide center take-off and batten mounted horizontal line sheaves as shown on the Drawings. sheaves shall be 3" diameter sleeve-bearing wheels and heavy duty steel housing.

10. All steel components shall be zinc plated to resist corrosion.

B. Configuration:

1. Configure tracks and related components as shown on the Drawings.

2. Provide all appurtenances required for complete and operable track systems of the various sorts.

C. Acceptable product or approved equal – Main Curtain System:

1. H&H Specialties 418P System with nylon ball bearing carriers.

2. ADC 283-N System with nylon ball bearing carriers

PART 3 - EXECUTION

3.1 PREPARATION

A. Furnish layouts for inserts, clips, or other supports required to be installed by other trades, if applicable, to support tracks and battens.

3.2 INSTALLATION, GENERAL

A. Install materials according to manufacturer's printed instructions and recommendations.

3.3 BATTEN INSTALLATION

A. Install battens by suspending at proper heights with steel cable spaced at not more than 8'-0" o.c.

B. Secure cable either directly to structures or to inserts, eye-screws, or other devices that are secure and appropriate to substrate, and that will not deteriorate or fail with age or elevated temperatures.

3.4 TRACK INSTALLATION

A. Batten-Hung Tracks: Install track by suspending from pipe batten with manufacturer's special pipe clamps at recommended spacing.

B. Heavy-Duty Track: Do not exceed 72 inches (1800 mm) between supports.

C. Install track for center-parting curtains with not less than 24 inches (600 mm) overlap of track sections at center, supported by special lap clamps.

3.5 CURTAIN INSTALLATION

A. Track-Hung: Secure curtains to track carriers with track manufacturer's special heavy-duty S hooks or snap hooks.

B. Batten Hung: Secure curtains to pipe battens with minimum 5/8 inch (16 mm) wide by 36 inches (900 mm) long braided soft cotton tie lines.

END OF SECTION 11062

SECTION 11132 - PROJECTION SCREENS

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. Front-projection screens.

1.3 DEFINITIONS

A. Gain: Ratio of light reflected from or refracted by screen material to that reflected perpendicularly from a magnesium carbonate surface as determined per FS GG-S-00172D(1).

B. Half-Gain Angle: The angle, measured from the axis of the screen surface, to the most central position on perpendicular plane through the horizontal centerline of the screen where the gain is half of the peak gain.

1.4 SUBMITTALS

A. Product Data: For each type of screen specified.

B. Shop Drawings: Show layout and types of projection screens. Include the following:

1. Location of wiring connections.
2. Location of seams in viewing surfaces.
3. Connections to suspension systems for pendant- and recess-mounted screens.
4. Anchorage details.
5. Details of juncture of exposed surfaces with adjacent finishes.
6. Accessories.
7. Wiring Diagrams: For electrically operated units.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain projection screens through one source from a single manufacturer. Obtain each screen as a complete unit, including necessary mounting hardware and accessories.

B. Coordination of Work: Coordinate layout and installation of projection screens with other construction supported by, or penetrating through, ceilings, including light fixtures, HVAC equipment, fire-suppression system, and partitions.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver projection screens until building is enclosed, other construction within spaces where screens will be installed is substantially complete, and installation of screens is ready to begin.

PART 2 - PRODUCTS

2.1 FRONT-PROJECTION SCREENS

A. Material and Viewing Surface of Front-Projection Screens: Provide screens manufactured from mildew- and flame-resistant fabric of type indicated for each type of screen specified and complying with the following requirements:

1. Matte-white viewing surface with gain characteristics complying with FS GG-S-00172D(1) for Type A screen surface.
2. Material: Vinyl-coated glass-fiber fabric.
3. Mildew Resistance: Provide mildew-resistant screen fabrics as determined by FS 191A/5760.
4. Fire-Test-Response Characteristics: Provide projection-screen fabrics identical to materials that have been tested for flame resistance according to both small- and large-scale tests of NFPA 701.
5. Seamless Construction: Provide screens in sizes indicated without seams.
6. Edge Treatment: Without black masking borders.
7. Provide extra drop length of dimension indicated to comply with the following requirements for fabric color and location of drop length:

    a. Color: Same as viewing surface.
    b. Location: At top of screen.

8. Size of Viewing Surface: As indicated on drawings; Manual screens (8’ x 8’); Electrical Screens (12’ x 8’);

B. Manually Operated Screens: Provide manufacturer's standard spring-roller-operated units designed and fabricated for wall or ceiling installation and consisting of case, screen, mounting accessories, and other components necessary for a complete installation.

1. Screen Case: Fabricated in 1 piece from steel sheet not less than 0.0299 inch (0.75 mm), with flat back design and vinyl covering or baked-enamel finish. Provide end caps with integral roller brackets and universal mounting brackets, finished to match end caps, for wall or ceiling mounting.
2. Screen Mounting: Top edge securely anchored to a 3-inch- (75-mm-) diameter, rigid steel spring roller; bottom edge formed into a pocket holding a tubular metal slat, with ends of slat protected by plastic caps, and saddle and pull attached to slat by screws.

C. Electrically Operated Screens, General: Provide manufacturer's standard UL-labeled units consisting of case, screen, motor, controls, mounting accessories, and other components necessary for a complete installation. Remotely control operation of each screen to comply with the following:

1. Single-Station Control: 3-position control switch with metal device box and cover plate for flush wall mounting and for connection to 120-V, ac power supply.

2. Motor in Roller: Instant-reversing motor of size and capacity recommended by screen manufacturer with permanently lubricated ball bearings, automatic thermal-overload protection, preset limit switches to automatically stop screen in up and down positions,

and positive-stop action to prevent coasting. Mount motor inside roller with vibration isolators to reduce noise transmission.

3. Screen Mounting: Top edge securely anchored to rigid metal roller and bottom edge formed into a pocket holding a 3/8-inch- (9.5-mm-) diameter, metal rod with ends of rod protected by plastic caps.

   a. Roller for motor in roller supported by vibration- and noise-absorbing supports.

D. Electrically Operated Screens with Automatic Ceiling Closure: Units designed and fabricated for recessed installation in ceiling with bottom of case composed of 2 panels fully enclosing screen, motor, and wiring; 1 panel hinged and designed to open and close automatically when screen is lowered and fully raised, and the other panel removable or openable for access to interior of case; and complying with the following requirements:

1. Screen Case with Motor in Roller: Wood or medium-density-fiberboard sides and top with metal-lined wiring compartment and aluminum or medium-density-fiberboard bottom panels, factory primed and constructed as follows:

   a. Offset mount bottom panels so their bottom surface will align flush with adjoining ceiling and the bottom edges of case sides and ends will be recessed behind ceiling finish.
   b. Provide single or double top as standard with manufacturer.

E. Products: Subject to compliance with requirements, provide one of the following:

1. Matte-White Viewing Surfaces:

   a. Matte White; Bretford Manufacturing, Inc.
   b. Matte White; Da-Lite Screen Co., Inc.
   c. Fiberglass Matte White; Draper Shade & Screen Co., Inc.

2. Manually Operated Front-Projection Screens:

   a. Series 200; Bretford Manufacturing, Inc.
   b. Model B; Da-Lite Screen Co., Inc.
   c. Luma; Draper Shade & Screen Co., Inc.

3. Electrically Operated Screens with Automatic Ceiling Closure, Motor in Roller:

   a. Boardroom Electrol; Da-Lite Screen Co., Inc.
   b. Envoy; Draper Shade & Screen Co., Inc.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install projection screens at locations indicated to comply with screen manufacturer's written instructions.

B. Install front-projection screens with screen cases in position and relationship to adjoining construction indicated. Securely anchor to supporting substrate in a manner that produces a smoothly operating screen with vertical edges plumb and viewing surface flat when screen is lowered.

1. Test electrically operated units to verify that screen, controls, limit switches, closure, and other operating components are in optimum functioning condition.
2. Test manually operated units to verify that screen operating components are in optimum functioning condition.

3.2 PROTECTING AND CLEANING

A. Protect projection screens after installation from damage during construction. If damage occurs despite such protection, remove and replace damaged components or entire unit as required to provide units in their original, undamaged condition.

END OF SECTION 11132

SECTION 11400 - FOOD SERVICE EQUIPMENT

PART I - GENERAL

1.1. GENERAL REQUIREMENTS

A. Provisions of all of the Contract, including General and Supplementary Conditions and Division 1 - General Requirements apply to the work specified herein.

1.2. STANDARDS

A. Equipment and installation thereof shall meet all requirements of the applicable portions of the latest editions of Standards listed below.

1. American Society for Testing Materials (ASTM)
2. National Electrical Code (NEC)
3. American Gas Association (AGA)
4. Louisiana State Board of Health
5. National Sanitation Foundation (NSF)
6. Factory Mutual (FM)
7. Underwriters Laboratory (UL)
8. Occupational Safety and Health Administration (OSHA)
9. National Fire Protection Association (NFPA)

1.3. DESCRIPTION OF WORK

A. Work in this Section includes the following:

1. Furnishing, delivery, un-crating, setting in place at locations indicated on Drawings, leveling, adjusting and cleaning all equipment specified herein.

2. All components required for a complete assembly to serve the intended function when connected to mechanical and electrical services.

3. Coordination of all Work required for a complete installation with other trades and subcontractors.

4. Sink faucets, strainers, vacuum breakers, duo drains, lever handle drains and tailpieces specified under heading entitled Fabrication Standards.

5. Cutting of all holes in equipment tops, shelves and bodies required for piping (water and drains) and wiring.

B. Related Work specified elsewhere:

1. Water piping, line shut-off valves and final connections to the equipment.

2. Drain piping, floor drains, floor sinks, “P” traps, grease traps and final connections to equipment.

3. Electrical wiring, overload protection devices, line disconnect switches and final connections to equipment.

4. Structural framing where required at hanger rod locations to support Exhaust Ventilators.

1.4. DRAWINGS AND SPECIFICATIONS

A. Specifications and drawings shall be considered as a part of the Contract to be executed. The intent of said Drawings and Specifications is for all components required for a complete installation of food service equipment specified.

B. Should any error, omission or conflict occur in the Drawings and Specifications, the Contractor shall not avail himself of such error, omission or conflict but shall have same explained and adjusted prior to signing the Contract.

C. All addenda shall be considered as a part of the original Contract Documents.

1.5. QUALITY AND WORKMANSHIP

A. All equipment shall be constructed in strict compliance with standards of the National Sanitation Foundation and shall bear the NSF label. All equipment shall meet all standards set by state and local regulations.

B. All electrical equipment shall be approved by Underwriter's Laboratories and shall bear its seal of approval.

C. All electrical components of equipment shall meet the requirements of the National Electric Code.

D. All material shall be new (latest model at time of delivery) and of first quality. All equipment shall be installed in an undamaged condition. Where brands, materials, apparatus or equipment is specifically designated, no substitution shall be made without prior approval in writing.

E. Provide all Work in the best manner in conformity with the best standard practices. Employ qualified, efficient and skillful workers for installation in a first class manner.

F. It is required that custom fabricated equipment be fabricated by a Food Service Equipment Fabricator who has the plant, personnel and engineering facilities to design, detail and manufacture high quality equipment.

1.6. FOOD SERVICE EQUIPMENT CONTRACTOR QUALIFICATIONS

A. Contractor shall possess the experience and ability to perform necessary services for a complete and workmanlike installation of food service equipment.

B. Contractor experience shall include a minimum of five (5) years experience as a successful Food Service Equipment Contractor and shall have successfully completed the installation of at least five (5) comparable projects of similar size and nature.

C. Contractor's in-house capabilities shall include preparation of dimensioned mechanical/electrical rough-in Drawings, experienced personnel to coordinate with other trades the proper equipment installation, warranty services, and proper demonstration of equipment on operation, service and maintenance.

1.7. SUBMITTALS

A. Food Service Equipment Contractor shall make a preliminary submittal (for preliminary review only) consisting of two (2) copies of the necessary shop drawings, brochures and dimensioned

mechanical/electrical rough-ins to the Food Facilities Consultant within forty five (45) days of the award of the Contract for the purpose of expediting approval of the submittal data. The necessary changes shall be incorporated in the regular submittal. Submittals shall consist of six (6) sets of Product Data, (brochures) of standard manufactured items of equipment, one (1) set of translucent bond or other approved reproducible of Shop Drawings of custom fabricated equipment and dimensioned mechanical and electrical rough-in drawings. Partial Submittals will be given no consideration and will be returned to the Contractor without being reviewed.

B. Product Data shall be bound in book form in numerical order. Each manufacturer's specification sheet will be preceded by a type-written description of the manufacturer, model number, accessories and modifications required to meet the intent of the Specifications.

C. Shop Drawings of custom fabricated equipment shall be drawn at a minimum scale of 3/4" to the foot plus the necessary cross-sections at a scale of 1-1/2" to the foot.

D. Mechanical/Electrical rough-in drawings showing the utility requirements of the equipment specified herein shall be accurately drawn to scale with the necessary dimensions indicating elevations and distances from centerline of columns, finished walls, etc. The contractor shall be responsible for determining the exact location of the outlets on walls and floors, where applicable, and not as it exists on the equipment. Provide all materials and equipment required for all traps, ells, valves, faucets, tailpieces, etc. Rough-in Drawings shall include utility requirements for existing and future equipment listed in Specifications and Drawings. Rough-in Drawings shall include area floor drains and electrical convenience outlets shown on the Drawings.

E. Contractor shall be responsible for taking all field dimensions which affect the equipment and installation thereof. At the time of taking the field measurements, the Contractor shall report to the Architect all Work performed by others which will prevent him form the execution of his Work as required under the Contract and shall obtain the Architect’s instructions before proceeding.

F. Submit all warranties specified herein in triplicate prior to Substantial Completion.

1.8. PROTECTION OF WORK AND MATERIALS

A. Contractor shall at all times cover and protect his Work, material and equipment to save same from damage. Contractor shall at all times exercise due care to protect the work of others. Cost of any repair or replacement of damaged Work, material and equipment shall be borne by the Contractor.

1.9. BRANDS AND TRADE NAMES

A. Contractors are cautioned that only food service equipment and related items manufactured in accordance with Specifications will be acceptable. Contractors proposing to supply equipment not in compliance with these Specifications shall obtain Architect's approval in writing of any proposed deviation. Where brand names and model numbers are specified, it is not intended that competition be limited, but to set standards of performance, design, capacity, durability and appearance. Bidders desiring to quote on brands of equipment other than those specified shall submit a written request to the Architect with a copy to the Consultant seven (7) days prior to bid date in order that such substitutions can be considered for approval and if approved, an addendum issued to all plan holders. It is understood that approval of substitutions does not relieve the Contractor from furnishing equipment to meet the intent and requirements of the Specifications. Approval of substitutions does not relieve Contractor from additional costs of mechanical and electric utilities and other requirements not included in Contract Documents.

1.10. WARRANTIES

A. Contractor shall provide a one (1) Year Warranty from date of Substantial Completion or occupancy on all Work provided under these Specifications. This Warranty shall cover replacement of defective material, transportation and labor, but does not include costs of replacement parts and labor caused by the Owner's carelessness or misuse of the equipment. An additional four (4) year warranty (labor not included) shall be provided on all refrigeration condensing units. Contractor shall provide a reputable and qualified service agency, located within fifty (50) miles of the Project site, to provide immediate service for all refrigeration equipment.

PART 2 - PRODUCTS

2.1 CUSTOM FABRICATED EQUIPMENT MANUFACTURERS

A. Equipment manufacturers shall be Ace Fabrication, Inc.; Low Temp Manufacturing Company; Kitchen Equipment Fabricating Company; Missouri Equipment Company; or a prior approved equivalent.

B. All fabricated equipment shall be manufactured by one (1) manufacturer to ensure uniformity in design and finish.

2.2 ELECTRICAL REQUIREMENTS

A. Refer to Drawings for specific requirements.

B. Fixtures wired for three phase shall have loads balanced as equally as possible.

2.3 SWITCHES AND CONTROLS

A. A suitable control switch or starter of proper type in accordance with Underwriter's Code shall be supplied for each motorized appliance or electrically- heated unit.

B. Said switches and Controls shall be mounted in recessed die-stamped stainless steel cups or otherwise indented to prevent damage.

2.4 METAL FABRICATION STANDARDS

A. Materials:

1. All stainless steel shall be type 302 or 304 with 18% chromium, 8% nickel and a maximum of 0.12% carbon. All sheets shall have a No. 4 finish with all sheets with colors and finish uniform throughout.

2. Where galvanized steel is specified, a tight coat galvanized copper bearing finish shall be furnished. Galvanized steel shall be furnished in largest possible sheets with as few joints as necessary.

B. Welding:

1. All welded parts shall be non-porous and free from imperfections, pits, cracks or discolorations.

2. Stainless steel joints and seams shall be heli-arc welded, ground smooth and polished to

a No. 4 finish. Welds of galvanized steel shall be ground smooth, sand-blasted and sprayed with molten zinc at 1200 degrees Fahrenheit to a thickness of .004". Tinning of welds is not acceptable. All welds shall be ground smooth and polished to the original finish of the metal.

C. Field Joints:

1. Field joints shall be located for practical construction with sizes convenient for shipping and entry into building spaces.

2. All field joints shall be fully (continuous) welded with same type metal, ground smooth and polished to the original finish of the metal.

D. Table and Counter Tops:

1. All tops, unless otherwise specified, shall be constructed of 14 gauge stainless steel. Exterior edges not adjacent to walls or other equipment shall be rolled down 1-3/4" with corners bullnosed. Tops adjacent to walls shall be turned up 6" and back 1" (minimum) on a 90 degree angle to form a backsplash. Tops adjacent to other equipment shall be flanged straight down 1-3/4". Sound deadening material shall be provided between frame members and stainless steel tops.

2. Edges of dishtable tops not adjacent to walls shall be turned up 3" and rolled down 1-1/2" with corners bullnosed. Dishtable tops adjacent to walls shall be turned up 6", back 2-1/2" on a 45 degree angle and down 2" to form a pipe chase. All horizontal edges and internal corners of dishtable tops shall be coved on a 5/8" minimum radius. Ends of backsplashes shall be closed, welded, ground smooth and polished.

3. Edges of preparation counter tops (with sinks) not adjacent to walls shall be turned up 7/8" on a 45 degree angle and rolled down 2-5/8" to form a marine roll unless specified otherwise. Preparation counter tops (with sinks and cantilevered overshelf uprights) adjacent to walls shall be turned up 10", back 2-1/4" on a 45 degree angle and straight down 2" to form a backsplash with pipe chase. All horizontal edges and internal corners of preparation counter tops shall be coved on a 5/8" minimum radius. Ends of backsplashes shall be closed, welded, ground smooth and polished. Backsplashes of counter tops with sinks shall be pierced on 8" centers over sinks.

4. All tops shall be reinforced on the underside with 12 gauge (minimum) stainless steel hat channels running from front to back with center bracing where required to hold tops flat. The channels shall be stud welded and bolted to underside of tops with legs, bodies and drawer housings secured to the channels so that bolts or rivets will not extend through the work tops. Holes required for counter equipment shall be neatly die-punched with raised edges.

E. Open Bases:

1. Open bases shall be constructed of 1-5/8" OD 16 gauge stainless steel tubular uprights and crossbraces fully welded together, ground smooth and polished. Top of crossbraces shall be 12" above floor. Refer to Drawings for arrangement of crossbraces. Uprights shall be fitted at floor with adjustable, sanitary stainless steel bullet feet inserted into uprights with inside threads to eliminate any possibility of threading collecting dirt and other matter. Tops of legs shall be fitted into die-stamped fully enclosed stainless steel gussets equivalent to Component Hardware No. A20-0206 welded to the reinforcing channels on the underside of stainless steel tops.

2. Tables 6' 0" long and under shall have four (4) legs and tables 7' 0" long shall have six (6) legs. Legs shall be spaced not more than 5' 0" apart unless specified otherwise.

F. Undershelves and Interior Shelves:

1. All undershelves and interior shelves shall be constructed of 18 gauge stainless steel.

2. Undershelves on open base tables shall be sectional, removable and rolled down over crossbraces, unless specified in Itemized Equipment Specifications. Shelves adjacent to walls and other equipment shall turn up 2". Shelves shall be notched around table uprights and crossbraces, so that undershelves are easily removable. All edges of sections adjacent to each other shall be turned down 1" (minimum) for rigidity.

3. All interior shelves of cabinet bodies and bases shall be stationary unless specified otherwise. Sides and rear edges of shelves shall be turned up 1-1/2", down 1-1/2" and in 2" on front. Shelves shall be welded to cabinet bodies and braced on underside. Weld marks or spots shall not be visible on exterior of counter base panels. Where removable interior shelves are specified, edges of shelves shall be turned down 1-1/2" on all sides with sections supported by angle framework. Where plumbing and other appurtenances pass through counter bases, 5" wide open chases, concealed by 6" wide rear vertical pilaster trim, shall be provided to accommodate piping.

G. Drawers:

1. All drawers shall be 20" x 20" x 5" deep unless specified otherwise. Removable pans shall be formed of one-piece die-stamped 18 gauge stainless steel with top edges flanged out 2". Faces of drawers shall be equivalent to Component Hardware No. J85-2000. Drawers shall operate on ball-bearing roller stainless steel extension slides to allow full opening and shall be fitted with adjustable stops to prevent drawers from being pulled out too far so they will drop down.

2. Drawers shall be completely enclosed in 18 gauge stainless steel housing attached to the undersides of tops on open base tables and shall be attached to framework of cabinet base tables.

H. Casters:

1. Casters specified for open base tables shall be equivalent to Component Hardware Nos. C23-3135 and C23-3136.

2. Casters specified for cabinet base tables shall be equivalent to Component Hardware Nos. C21-3050 and C21-3051.

I. Sinks:

1. Sinks shall be constructed of 14 gauge stainless steel having back, bottom and front formed of one (1) continuous sheet of metal with ends and partitions welded in place. All vertical and horizontal corners of sink compartments shall be coved with metal on a 5/8" (minimum) radius. No solder filleting will be acceptable. All edges of sink counter tops not adjacent to walls shall be turned up 7/8" on a 45 degree angle, and rolled down 2-5/8" to form a marine roll unless specified otherwise. Edges of sink counter tops adjacent to wall shall be turned up 10", back 2-1/4" on a 45 degree angle and down 2" to form a backsplash with pipe chase. All ends of backsplashes shall be closed, ground smooth and polished. Backsplashes shall be pierced on 8" centers over compartment dividers of two, three and four compartment sinks and over center of one compartment sinks unless

specified otherwise. Bottom of each sink compartment shall be fitted with Fisher No. 22209 lever handle drain. Drains shall set into embossed openings in sink bottoms, gasketed and locked in place without the use of rivets or bolts. Sinks shall be mounted on 1-5/8" OD 16 gauge stainless steel legs with adjustable stainless steel feet (same as specified for open base tables). All sink partitions shall be 7/8" thick double wall construction. A model No. B-0231 T & S mixing faucet (12" spout) shall be mounted at the center of each single compartment sink and over each partition of each multiple compartment sink. Preparation and utensil wash sinks shall be 12" and 14" deep respectively unless specified otherwise.

2. Sink inserts shall be constructed same as specified for sinks above with coved corners and 2" lever drains. Sink inserts shall be welded integral with stainless steel tops. Inserts unless otherwise specified, shall have a T & S model No. B-0222-059X faucet deck-mounted behind each compartment.

2.5 ITEMIZED EQUIPMENT SPECIFICATIONS

A. ITEM NO. 1 STORAGE SHELVING UNIT (ONE REQUIRED):

1. Kelmax No. AFCS series, or approved equal, with components/features/accessories as follows:

a) Four (4) 24" wide x 48" long 1 1/2" square welded tubular shelves, bottom shelf 12" above floor with equal clearances for other shelves
b) Four (4) 72" long tubular posts with adjustable feet

B. ITEM NO. 2 MIXING FAUCET W/HOSE THREADS - DIVISION 15 (PLUMBING)

C. ITEM NO. 3 CLOTHES WASHER - NOT IN CONTRACT

D. ITEM NO. 4 CLOTHES DRYER - NOT IN CONTRACT

E. ITEM NO. 5 STORAGE SHELVING UNITS (FIFTEEN REQUIRED):

1. Lengths indicated on drawings, Kelmax No. AFCS series, or approved equal, each with components/features/accessories as follows:

a) Three (3) 20" wide 1 1/2" square tubular shelves, bottom shelf 12" above floor with equal clearances for other shelves
b) Four (4) 72" long tubular posts with adjustable feet

F. ITEM NO. 6 DUNNAGE RACKS (FIVE REQUIRED):

1. Kelmax No. DRC362412 or approved equal

G. ITEM NO. 7 WALK-IN COOLER/FREEZER (ONE REQUIRED):

1. General: Walk-in shall be pre-fabricated modular construction, designed and constructed to allow for fast and easy field assembly, relocation, and modification by addition of modular panels.

2. Project Requirements: Walk-in shall be pre-fabricated, urethane-insulated metal floor type installed within 5" deep concrete floor recess with 2" thick-set quarry tile wearing floor surface, same level as adjacent floor surface.

3. Size: Walk-in shall be 19’ 3" wide x 28’ 4 ½" deep x 8' 6" high with arrangement indicated on drawings.

4. Finishes: Exposed exterior wall and ceiling panels (including exposed floor and ceiling caps shall be 20-gauge stainless steel. Interior wall and ceiling panels shall be 20-gauge stainless steel. Unexposed wall and ceiling panels shall be 26- gauge galvanized steel. Floor panels shall be 14-gauge galvanized steel (unexposed). Interior/exterior doors/door panels shall be 20-gauge stainless steel.

5. Panel Construction: Panels shall consist of metal pans, formed to precise dimensions, with “foamed-in-place” urethane to permanently bond to inner metal surfaces to form strong rigid units. Standard wall, ceiling, and floor panels shall 11½”, 23", 34½”, 46", and 69" wide. Standard corner panels shall be 12" x 12" on 90-degree angle. Special fabricated panels shall be provided to meet project requirements. Panels shall be equipped with NSF-approved double-bead interior and exterior vinyl gaskets which are resistant to stains, grease, oil, mildew, and sunlight. Panels shall be equipped with cam-action locking mechanisms (hook and arm assemblies) securely mounted in matching panel locations to form air-tight and vapor-proof joints. Locking mechanism parts shall be equipped with urethane plugs and snap-in caps to match interior finish of panels.

6. Insulation: Insulation shall be 4" thick rigid, low ozone depleting HCPC 22 blown Class 1 urethane foam classified according to UL723 (ASTM-E-84) as tested by Underwriter’s Laboratories, Inc. Four (4) inch core material shall have a flame spread of 25 or less and a smoke density of 250. Insulation shall have a thermal conductivity (K Factor) of not more than 0.125 BTU/hr/sf per degree Fahrenheit/inch, on overall coefficient of heat transfer (U factor) of not more than .031, and R factor of 32. Pre-fabricated urethane foam panels shall be supplied with a Class 1 fire hazard classification according to UL723 (ASTM-E-84) as tested by Underwriter’s Laboratories, Inc. Panels shall have a flame spread rating of 25 or less with a certifying UL labels.

7. Entrance Doors and Door Panels: Refer to drawings for door locations and directions of door swings. Doors shall be 48" wide x 76" high, infitting flush-mounted type with one-piece perimeter PVC accordion-type removable gasket with magnetic core at top and side perimeters at doors. Adjustable wiper gaskets shall be mounted on bottom edge of doors. Door latches shall be high pressure zinc die cast with polished chrome finish with break-away inside safety release handles so that doors can be opened from inside, even if locked, and cylinder locks. Doors shall be equipped with positive-action hydraulic door closers to ensure positive closing of doors. Hinges of 36" wide doors shall be 9-inch modified strap, cam-lift, self-closing design with door lift-off capability, same type and finish as door latches. Hinges of 42" and 48" wide doors shall include 21-inch straps. Aluminum diamond treadplates (1/8" thick shall be mounted on the lower 36" of interior and exterior door surfaces. Door panels shall be equipped with heavy reinforced steel “U” channel frame on entire door perimeter. Anti-sweat heater cables shall be run in breaker strips located behind removable heavy-gauge stainless steel trim for easy access to heater cables. Heater cables shall be run within heavy-gauge “U” channels of 14-gauge stainless steel (minimum) thresholds. Each door panel shall include a pre-wired incandescent vapor-proof light, light switch with pilot light, 2½” diameter chrome face, and flush-mount dual-reading adjustable dial thermometer on exterior surface to provide temperature readings of minus 40-degrees F to plus 60-degrees F and minus 40-degree C to 150-degree C.

8. Pressure Relief Ports: Walk-in freezer rooms shall include 2-way heated pressure relief ports (vents) to equalize pressure between interior and exterior pressures caused by sudden temperature changes due to opening doors, loading of products, and/or defrosting of coils. Pressure relief ports shall be located in panels away from the direct air stream of

evaporator coils.

9. Ceiling Light Fixtures: Eight (8) 100-watt incandescent moisture-proof ceiling-mounted light fixture(s) with light bulbs and junction box assemblies for top of ceiling panels installation by this contractor. Junction box assemblies shall include threaded electrical conduit (urethane-filled), junction boxes (installed on top of ceiling panels), and 120-volt wiring to junction box. Horizontal runs of conduit within interior of walk-in is unacceptable.

10. Warranty: Walk-in panels shall include a ten (10) year factory warranty for defects in materials and workmanship from date of Substantial Completion of project.

11. Trim Strips and Closure Panels: Trim strips to match finish of exposed exterior walk-in panels shall be furnished and installed in a workmanlike manner to conceal cracks between walk-in and building walls. Closure panels, constructed in accordance with drawings and project requirements, shall be mounted on top of walk-in to match exposed exterior walk-in panels.

12. Temperature Alarm Systems: Systems shall be Modularm No. 75B with battery back-up for cooler and freezer rooms, manufactured by Modularm Corporation, 91-101 Broadway, Greenlawn, NY 11740. System shall include recessed type, stainless steel control panel (installed by walk-in manufacturer in front exterior panel of cooler room), temperature probes, and necessary 18-22 gauge low voltage control wiring within electrical conduit in accordance with system manufacturer's recommendations to meet project requirements. System shall be connected to 120-volt power source for cooler room coil, lights, and door heater. System shall provide digital readout on demand of each monitored temperature and shall provide independent field adjustable alarm temperature set points and field adjustable time delays to override normal rises in compartment temperature for each monitored point. Visual annunciation shall consist of a read indicator light for each monitored point, which will be off when temperature is safe, blinking when temperature is abnormal to indicate that the time delay has been activated, and on continuously when an alarm occurs. Simultaneously when an alarm occurs, the horn will sound, and the internal relay will be energized to provide dry contact outputs for remote notification by others. Resetting is to be accomplished manually.

13. Quality Standards: Walk-in shall be manufactured by Thermo-Kool, American Panel, Harford, or approved equal.

H. ITEM NO. 8 REMOTE REFRIGERATION SYSTEM (ONE REQUIRED):

1. System shall include a U.L. Listed, pre-engineered, and factory-assembled remote, air-cooled condensing unit package located on concrete pad outside building where indicated on drawings. Package shall include Copelaweld, Copelametic, or Discus semi-hermetic compressors, dual pressure controls, sight glasses, liquid line driers, suction and discharge vibration eliminators, flood back head pressure controls, and over-sized receivers. A crankcase heater shall be provide for each compressor.

2. All refrigerant lines shall be extended to one (1) side of the package in a neat and orderly manner, easily identified by the system it will service. All tubing shall be insulated (½" minimum thickness) securely supported and anchored with clamps. All copper shall be refrigerant-grade A.C.R. or type "L" silver solder and/or sil-flos can be used for all refrigerant piping. Soft solder is not acceptable. All piping shall be pressure tested, with nitrogen, at 300 psi.

3. System shall include an outdoor frame and housing constructed of 12 gauge and 16 gauge, galvanized steel painted with a primer coat of epoxy-based paint and a finish coat

of polyurethane acrylic enamel.

4. System shall include an interior-mounted, weatherproof, pre-wired, electrical control panel with a NEMA 3R fused disconnect switch, circuit breakers, and contactors (for each compressor), time clock, start capacitors, and fan cycle control thermostats for each fan motor. A wiring diagram of the refrigeration system shall be mounted within housing of system.

5. System shall include 2.1 HP and 4 HP compressors for cooler and freezer rooms respectively. System shall include AA36-170B and AE56-210B evaporator coils for cooler and freezer rooms respectively. Coils shall be equipped with factory-assembled thermostats, solenoid valves, expansion valves, pre-wired kill switch w/timer (for freezer), and accessories for a complete and workmanlike installation that shall meet project requirements.

6. System shall be Cold Zone No. MPL-2CZ (designed for R404A refrigerant) or approved equal. Submit shop drawings for approval.

7. Installation: This contractor shall furnish and install all necessary valves, controls, oil separators, refrigerant tubing, refrigerant R404A, condensate drain lines, and accessories for a complete and neat workmanlike job in accordance with the best refrigeration practices. All refrigerant lines subject to sweating shall be insulated with elastomeric, thermal insulation (½" thick for coolers and 3/4" thick for freezers) with all joints sealed with glue as recommended by the manufacturer of the insulation. Duct tape at joints is not acceptable. Refrigerant lines shall be rigid, type L copper with all joints soldered to meet the best refrigeration practices. Refrigerant lines shall be anchored to building structure with clamps and galvanized steel saddles as required. Condensate drain lines shall be rigid, type L copper securely fastened to walk-in panels with non-corrosive clamps (straps are not acceptable). Condensate drain lines installed in freezer rooms shall be wrapped with insulated tape. Condensate drain lines installed in cooler rooms shall not be insulated. Condensate drain lines shall be generously sloped to the bottom of walk-in rooms, extended through walk-in panel, through building walls (where applicable, and trapped outside walk-ins. All refrigeration systems shall be checked out to the Owner's satisfaction. This contractor shall provide an acceptable, local refrigeration service agency which shall provide 24-hour, 7-day warranty service.

8. An 18 gauge stainless steel channel enclosure panel shall be provided for all exposed refrigerant lines on exterior building wall.

I. ITEM NO. 9 SHELVING UNITS (TWENTY-TWO REQUIRED):

1. Kelmax No. AFCS series, or approved equal, each with components/features/ accessories as follows:

   a) Four (4) 20" wide x 48" long square welded tubular shelves, bottom shelf 12" above floor with equal clearances for other shelves
   b) Four (4) 72" long tubular posts with adjustable feet

J. ITEM NO. 10 DUNNAGE RACKS (SIX REQUIRED):

1. Kelmax No. DRC362412, or approved equal

K. ITEM NO. 11 MOBILE FOOD DELIVERY CARTS (FOUR REQUIRED):

1. Cambro No. 1826DTC FOR 18” X 26” pans, or approved equal

L. ITEM NO. 12 MOBILE FOOD DELIVERY CARTS (FOUR REQUIRED:

1. Cambro No. UPC800 for 12” x 20” pans, or approved equal

M. ITEM NO. 13 WORK TABLE (ONE REQUIRED):

1. 30" wide x 72" long x 36" high, custom-fabricated stainless steel open base type, each with components/features/accessories as follows:

   a) Two (2) drawer
   b) Undershelf

N. ITEM NO. 14 PREPARATION COUNTER W/SINK (ONE REQUIRED):

1. 30" wide x 12'-0" long x 36" high, custom fabricated stainless steel open base type, arrangement indicated on drawing, with components/features/accessories as follows:

   a) Marine roll top edges on front and exposed end
   b) One (1) 24" x 24" x 12" deep sinks
   c) One (1) splash-mount faucet
   d) Undershelves except at sink

O. ITEM NO. 15 HAND SINKS (6) – NOT IN CONTRACT (PLUMBING)

P. ITEM NO. 16 MIXING FAUCETS W/HOSE THREADS (3) - DIVISION 15 (PLUMBING)

Q. ITEM NO. 17 REACH-IN FREEZER (ONE REQUIRED):

1. Victory No. FS-2D-S7, or approved equal, with components/features/accessories as follows:

   a) Six (6) standard chrome-plated wire shelves
   b) 36" long 120-volt cord/plug assembly
   c) Temperature alarm system
   d) Stainless steel sills and trim at doors

R. ITEM NO. 18 PREPARATION COUNTER W/SINKS (ONE REQUIRED):

1. 30" wide x 13'-0" long x 36" high, custom fabricated stainless steel open base type, arrangement indicated on drawing, with components/features/accessories as follows:

   a) Marine roll top edges on front and ends
   b) Three (3) 24" x 24" x 12" deep sinks
   c) Two (2) splash-mount faucets
   d) Undershelves except at sinks

S. ITEM NO. 18A WORK TABLE (ONE REQUIRED):

1. 30” wide x 8’ 0” long x 36” high, custom fabricated stainless steel open base type with undershelf and two drawers

T. ITEM NO. 19 WORK TABLE (ONE REQUIRED):

1.30” wide x 8’ 0” long x 36” high, custom fabricated stainless steel open base type with

components/features/accessories as follows:

a) Two (2) drawers
b) Undershelf

U. ITEM NO. 20 SPARE NUMBER

V. ITEM NO. 21 TILTING BRAISING PANS (TWO REQUIRED):

1. Groen No. BPP-40G, or approved equal, each with component/features/ accessories as follows:

a) Faucet bracket
b) Hot and cold mixing faucets with 60" long hoses with kettle fillers and dummy wall hooks (attached to side of frame)

W. ITEM NO. 22 CONVECTION STEAMERS (THREE REQUIRED):

1. Groen No. (2)-SSB-5GF, or approved equal, each with components/features/accessories as follows:

a) One (1) 12" x 20" x 2-1/2" deep stainless steel perforated pan
b) One (1) 12" x 20" x 2-1/2" deep stainless steel solid pan
c) One (1) 12" x 20" x 4" deep stainless steel perforated pan
d) One (1) 12" x 20" x 4" deep stainless steel solid pan

X. ITEM NO. 23 CONVECTION OVENS (THREE REQUIRED):

1. Blodgett No. DFG-100 (double deck), or approved equal, each with components/features/accessories as follows:

a) Stainless steel front, solid doors, sides, top, and rear panel
b) 6" high stainless steel legs
c) Gas manifold for common connection

Y. ITEM NO. 24 UTILITY DISTRIBUTION SYSTEM (ONE REQUIRED):

1. System shall be a U.L. Listed, modular, wall-island-type energy distribution and control system manufactured in accordance with the latest edition of the National Electrical Code (NEC), National Manufacturer's Association (NEMA), National Fire Protection Association (NFPA) Pamphlet Nos. 96 and 54, Uniform Plumbing Code, ASME, and Occupational Safety and Health Administration (OSHA) using only U.L. Listed Bureau of Mines, and AGA and CGA certified components.

2. System shall be 15' 0" long x 8" wide and shall be completely pre-wired and pre-plumbed to final connection points for electricity, hot water, cold water and gas for the equipment shown on the drawings.

3. Fixed riser, pedestal, end caps, and raceway exterior panels shall be constructed of 16 gauge type 304 stainless steel with a No. 4 finish. Removable panels shall be constructed of 18 and 20 gauge stainless steel. A water tight barrier shall be provided between electrical and plumbing compartments. Control tower pedestals shall be secured to the building floor with stainless steel, interior flanges. Housing of the raceway shall be equipped with neoprene bumper strips.

4. Electrical compartment shall be a completely enclosed, stainless steel housing accessible by removal of stainless steel screws.

5. Internal electrical main feeder(s) shall be cable bus type having balanced load and phases with branch circuit locations directly behind connection plates. Cable bus shall be manufactured from 100% copper and mounted on non-conductive insulators spaced at 48" (maximum) centers and equipped with connection lugs for main service. Field joints shall be connected by attaching cables to insulated terminals. Branch circuit wiring for each electrical connection shall be phase-identified and sized in accordance with circuit breaker's rated ampacity. A 12" long, 16-gauge, stainless steel connection plate shall be provided for each electrical connection and equipped with a point-of-use circuit breaker and grounding type receptacle having a specific NEMA, polarized configuration or pre-wired, flexible, seal-tite conduit. Connection plates shall be equipped with metallic labels with permanently lettered electrical characteristics. Plates shall be spaced on 12" centers and readily interchangeable by maintenance personnel to facilitate changes, additions, and deletions of equipment. Blank plates shall be provided for future equipment. A main electrical circuit breaker and disconnect shall be mounted in the control tower.

6. Plumbing compartment shall be isolated from the electrical compartment and all piping and disconnects shall be color coded. Provide an additional capped nipple in each section for each plumbing service for future use. Field joints shall be securely by tightening unions.

7. Hot and cold water piping, including individual branch pipe connections, shall be hard temper type "L" copper tubing with copper sweat type solder fittings. All water lines shall be covered with 3/8" thermal closed cell pipe insulation per ASTM-E90-C. Each branch connection shall be provided with a brass, double shut-off, quick-disconnect, and flexible hose connector consisting of brass bellows type, corrugated hose with braided stainless steel restrainer. Hoses shall be coated with Avtec Polytec material to provide a smooth surface for cleaning.

8. Gas piping shall be black iron pipe with welded threadolets to branch connections and drip-tee in the service riser. Each branch connection shall be equipped with a quarter-turn, ball-type shut-off valve; brass quick-disconnect; 2-wall, stainless steel, flexible hose connecter; and steel restraining cable. Hoses shall be coated with Avtec Polytec material to provide a smooth surface for cleaning.

9. System shall be equipped with quarter-turn shut-off valves for all main incoming services for gas and water.

10. System shall be equipped with two (2) end risers, three (3) pedestals, 120 volt receptacle on each end, electrical power shut-off device, water quick disconnect hose assemblies (verify sizes), gas quick disconnect hose assemblies (verify sizes), 120 volt cord/plug assemblies. Refer to drawings for utility requirements and location of utility services.

11. System shall be Avtec MDS series, (island type) or approved equal. Shop drawings are required for approval.

Z. ITEM NO. 25 EXHAUST VENTILATOR – NOT IN CONTRACT

AA. ITEM NO. 26 FIRE SUPPRESSION SYSTEM – NOT IN CONTRACT

BB. ITEM NO. 27 WORK TABLES (TWO REQUIRED):

1. 30" wide x 72" long x 36" high, custom fabricated open base type, each with

components/features/accessories as follows:

a) Two (2) drawers
b) Undershelf
c) 6” high x 1” thick backsplash

CC. ITEM NO. 28 WORK TABLE W/OVERHEAD POT RACK (ONE REQUIRED):

1. 30" wide x 96" long x 36" high, custom-fabricated stainless steel open base type, each with components/features/accessories as follows:

a) Two (2) drawers
b) Undershelf
c) 90" long 2-bar table-mount overhead pot rack

DD. ITEM NO. 29 MOBILE PAN RACKS (5) - NOT IN CONTRACT

EE. ITEM NO. 30 MOBILE UTENSIL SHELVING UNIT (TWO REQUIRED):

1. Kelmax No. AFCS series, or approved equal, with components/features/ accessories as follows:

a) Four (4) 24" wide x 48" long 1 1/2" square welded tubular shelves, bottom shelf 12" above floor with equal clearances for other shelves
b) Four (4) 60" long tubular posts
c) Four (4) 5" diameter urethane swivel casters, two (2) with brakes
d) Four (4) 3 1/2" donut rubber bumper

FF. ITEM NO. 31 POT/PAN SINK (ONE REQUIRED):

1. 30" wide x 13'-6" long x 36" high, arrangement indicated on drawings, custom fabricated stainless steel open base type with components/features/accessories as follows:

a) Three (3) 24" x 30" x 14" deep sink compartments
b) Two (2) splash-mount faucets
c) Two (2) 36" long drainboard sections with uprights
d) Undershelves at drainboard sections

GG. ITEM NO. 32 SPARE NUMBER

HH. ITEM NO. 33 BAKER’S TABLE (ONE REQUIRED):

1. 30" wide x 72" long x 36" high, custom-fabricated stainless steel open base type with components/features/accessories as follows:

a) Open base for mobile ingredient bins

II. ITEM NO. 34 MOBILE INGREDIENT BINS – NOT IN CONTRACT

JJ. ITEM NO. 35 60-QUART MIXER (ONE REQUIRED):

1. Hobart No. HL-600, or approved equal, with components/features/accessories as follows:

a) One (1) 60-quart stainless steel bowl
b) One (1) 60-quart aluminum “B” batter beater

c) One (1) 60-quart stainless steel wire whip
d) One (1) 60-quart aluminum “ED” dough hook
e) One (1) 9" vegetable slicer attachment with one (1) 3/16" shredder plate, and one (1) grater plate
f) One (1) 60-quart bowl dolly
g) One (1) 60-quart stainless steel splash cover
h) One (1) 40-quart stainless steel bowl
i) One (1) 40-quart aluminum “B” batter beater
j) One (1) 40-quart stainless steel wire whip
k) One (1) 40-quart aluminum “E” dough hook
l) One (1) 40-quart stainless steel splash cover
m) One (1) 48" long NEMA L15-20P cord/plug assembly

JJ. ITEM NO. 36 ICE MACHINE (CUBER) W/STORAGE BIN (ONE REQUIRED):

1. Manitowoc No. QD-0452A (air cooled) Ice Machine with No. S-570 storage bin, or approved equal, and water filter sized to ice production capacity

KK. ITEM NO. 37 SLICER – NOT IN CONTRACT

LL. ITEM NO. 38 PASS-THRU REFRIGERATORS (TWO REQUIRED):

1. Victory No. RS-2D-S7-PT, or approved equal, each with components/features/ accessories as follows:

a) Twenty four (24) No. A/C stainless steel universal pan slides (to accommodate 12" x 20" and 18" x 26" pans)
b) 36" long 120-volt cord/plug assembly
c) Temperature alarm system
d) Stainless steel sills and trim at doors

MM. ITEM NO. 39 MOBILE HOT FOOD CABINETS (FOUR REQUIRED):

1. Carter Hoffman No. PH-1830, or approved equal, (without vinyl accent strips)

NN. ITEM NO. 40 MOBILE HOT FOOD COUNTERS (TWO REQUIRED):

1. Mod-U-Serve No. MCT-HF4, or approved equal, each with components/features/ accessories as follows:

a) Stainless steel front base panel
b) 12" wide x 64" long solid-type stainless steel fold-down tray slide
c) 8" wide x 64" long stainless steel fold-down work board
d) Full-length self service food guard (10" minimum clearance between bottom of food guard and counter top) with stainless steel shelf and pre-wired Hatco No. GRAL-48 heat lamp with incandescent lights and NEMA 5-20P cord/plug assembly (verify length)
e) Drains, drain manifold, and shut-off valve, and 72” long plastic hose
f) Drain line shall be terminated on rear side of base
g) Interlocking device
h) NEMA L6-30P cord/plug assembly (for hot food wells only)

OO. ITEM NO. 41 MOBILE FLAT TOP COUNTERS (TWO REQUIRED):

1. Mod-U-Serve No. MCT-FT2 (modified), or approved equal, each with

components/features/accessories as follows:

a) Stainless steel front base panel
c) Modified to be 24" long
c) 12" wide x 24" long solid type stainless steel fold-down tray slide
d) 8" wide x 24" long stainless steel fold-down work board
e) 24" long self-service food guard (10" minimum clearance between bottom of food guard and counter top) with stainless steel shelf and pre-wired Hatco No. GRAL-18 heat lamp with incandescent lights
f) Interlocking device
g) 48" long NEMA 5-20P cord/plug assembly

PP. ITEM NO. 42 MOBILE COLD FOOD COUNTERS (TWO REQUIRED):

1. Mod-U-Serve No. MCT-CF4, or approved equal, each with components/features/ accessories as follows:

a) Stainless steel front base panel
b) 12" wide x 64" long solid-type stainless steel fold-down tray slide
c) 8" wide x 64" long fold-down stainless steel work board
d) Full length self-service food guard (10" minimum clearance between bottom of food guard and counter top) with stainless steel shelf and pre-wired fluorescent light with light switch
e) Interlocking device
f) 48" long NEMA 5-20P cord/plug assembly

QQ. ITEM NO. 43 MILK COOLERS (TWO REQUIRED):

1. Mod-U-Serve No. MCT-SM2, or approved equal, with standard accessories and hinged side locks to ensure that doors will not drop down when top is opened

RR. ITEM NO. 44 MOBILE CASHIER COUNTERS (TWO REQUIRED):

1. Mod-U-Serve No. MCT-CRS-G, or approved equal, each with components/ features/accessories as follows:

a) Stainless steel front base panels
b) 12" wide x 27" long solid-type stainless steel fold-down tray slide (arrangement per drawings)
c) Hinged access panel to electric outlet
c) Pre-wired electric outlet
d) Cash drawer
e) Hinged access door at electrical outlet

SS. ITEM NO. 45 CPU UNITS (2) - NOT IN CONTRACT

TT. ITEM NO. 46 ROLL DOWN COUNTER DOOR W/INTEGRAL FRAME (ONE REQUIRED):

1. Cookson No. CDF, or approved equal (less window sill) to fit 60" long x 52" high wall opening (verify) with components/features/accessories as follows:

a) Stainless steel frame and door guide
b) Stainless steel hood
d) Stainless steel curtain
e) Shop drawing required for review and approval

UU. ITEM NO. 47 SOILED DISHTABLE W/WINDOW SILL (ONE REQUIRED):

1. 30" wide x 10’ 6” long x 34" high, arrangement indicated on drawings, custom-fabricated stainless steel open base type with components/features/accessories as follows:

   a) 14-gauge stainless steel window sill to fit wall opening and dishtable
   b) Two (2) 10" diameter die-stamped scrap openings in top where indicated on drawings
   c) 20" x 20" x 6" deep scrap sink with removable scrap basket and rack guide
   d) One (1) T & S No. B-0113 pre-rinse spray unit with B-0109 wall bracket
   e) Open base for trash receptacles at pass-thru window
   f) Dishtable to be furnished with rolled edge at end for future dishwasher

VV. ITEM NO. 48 DISHWASHER - NOT IN CONTRACT

WW. ITEM NO. 49 DISHWASHER PANT LEG EXHAUST DUCT - NOT IN CONTRACT

XX. ITEM NO. 50 ELECTRIC BOOSTER HEATER - NOT IN CONTRACT

1. Space and utilities designed for Hatco No. S-30B

YY. ITEM NO. 51 CLEAN DISHTABLE - NOT IN CONTRACT

ZZ. ITEM NO. 52 MOBILE KIOSK CART – NOT IN CONTRACT

AAA. ITEM NO. 53 POS STATION – NOT IN CONTRACT

BBB. ITEM NO. 54 MOBILE WORK TABLE (ONE REQUIRED):

1. 30" wide x 96" long x 36" high, custom-fabricated stainless steel open base type, each with components/features/accessories as follows:

   a) Lockable casters
   b) Undershelf
   c) To be located in dishroom in place of future Clean Dishtable

PART 3 - EXECUTION

3.1 ERECTION

A. Equipment specified herein shall be erected and set in place at location as indicated on Drawings. Equipment shall be fabricated so that it can be handled through finished openings or arrangements otherwise made with the General Contractor. The equipment specified shall be located on the floors as indicated on the Drawings. A competent foreman shall be provided as supervisor of the erections and installations.

3.2 ADJUSTMENT OF EQUIPMENT

A. Contractor shall adjust all equipment after erection and installation to the satisfaction of the Owner.

3.3 CLEANING OF EQUIPMENT

A. Clean up all debris caused by workmen immediately upon completion of Work in the area, and

clean equipment after all others have completed their Work in the area.

3.4 DEMONSTRATION OF EQUIPMENT

A. Upon acceptance by Owner, provide full instructions to the Owner's designated representative on the proper methods of care, operation and maintenance of equipment.

B. Three (3) operating instructions, warranty cards/certificates and parts manuals on the equipment in loose leaf hard cover binders shall be presented to the Architect at this time.

END OF THIS SECTION

SECTION 11450 – TELEVISION AND VIDEO MONITOR SUPPORTS

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. Section Includes: Prefab wall mounted video monitor or television support. The contractor shall furnish and install 9 monitor supports. Three shall be installed in the coffered area of the dining hall. The six remaining supports shall be installed as directed by the owner.

1.3 SUBMITTALS

A. Submit product data for video monitor supports in accordance with the conditions of Contract and Division/Specification Section.

B. Submit Manufacturer's full range of platform sizes for Architect's final selection on support sizes.

C. Submit the Manufacturer's detailed technical product data, installation instructions and recommendations, details of construction relative to fastening and structural support.

1.4 WARRANTY

A. The mounting bracket used shall be supplied with a warranty against defects in workmanship and materials for at least 5 years.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

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

1. TV/Video monitor supports:

   a. Peerless: Model No. LWB 354T **with VCR bracket**, or approved equal.
   b. Dalite
   c. Lucasey

2.2 MATERIALS

A. Supports: Construction of brackets shall be heavy gauge steel with MIG welds, finished in scratch resistant matte fused epoxy finish.

B. System Performances: The TV/Monitor bracket be pre-engineered to have sufficient strength to support the TV monitor for which it is designed, with adequate safety factor. It shall be installed with a wall or ceiling attachment device capable of supporting the weight of the TV/Monitor and the bracket itself. The TV/Monitor shall offer swivel capability and where required either fixed or adjustable tilt so that the viewing of the

screen may be adjusted by the end user. In the case of mounts, which enclose the monitor top, bottom, and at side if the brackets shall be adjustable in both height and width to ensure proper fit.

PART 3 – EXECUTION

3.1 MANUFACTURERS INSTRUCTIONS

A. Comply with Manufacturers Product Data including Product Catalog installation instructions, and Product Carton instructions.

3.2 EXAMINATION

A. Site verification of conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with Manufacturers instructions.

3.3 INSTALLATION

A. TV Monitor mount shall be installed where indicated on plans. All fasteners and components for the assembly of the bracket shall be furnished by the Manufacturer. Fasteners for affixing the bracket to the wall or ceiling shall be furnished by the Manufacturer. (Specify construction type to order appropriate fasteners).

3.4 PROTECTION

A. Protection: Protect installed product and finish surfaces from damage during construction.

END OF SECTION 11450

SECTION 11490 - GYMNASIUM AND OUTDOOR ATHLETIC EQUIPMENT

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 gymnasium and outdoor athletic equipment:

1. Basketball equipment.
2. Volleyball equipment.
3. Wall-mounted and post column safety pads.

B. Products furnished, but not installed under this Section, include floor insert sleeves for inserts to be cast in concrete subfloors and footings.

1.3 DEFINITIONS

A. NFHS: National Federation of State High School Associations.
B. LHSAA: Louisiana High School Athletic Association.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, features, and finishes. Include details of anchors, hardware, and fastenings. If applicable, include assembly, disassembly, and storage instructions.

1. Motors: Show nameplate data, ratings, characteristics, and mounting arrangements.

B. Shop Drawings: Show location and extent of fully assembled gymnasium equipment. Show location and extent of disassembled equipment and components and transport and storage accessories. Include elevations, sections, and details not shown in Product Data. Show method of field assembly, connections, installation details, mountings, floor inserts, attachments to other Work, operational clearances, and relationship to adjoining work.

1. Blocking and Reinforcement: Show locations of blocking and reinforcement required for support of gymnasium equipment.
2. Setting Drawings: For cast-in floor insert sleeves for post standards.
3. Design Calculations: Signed and sealed by a qualified professional engineer. Calculate requirements for supporting gymnasium equipment. Verify capacity of members and connections to support loads and verify loads, point reactions, and locations for attachment of gymnasium equipment to structure with those indicated on Drawings.
4. Gymnasium Equipment Operators: Show locations and details for installing operator components, switches, and controls. Indicate motor size, electrical characteristics, drive arrangement, mounting, and grounding provisions.
5. Wiring Diagrams: Power, signal, and control wiring.

C. Coordination Drawings: Court layout plans and elevations drawn to scale and coordinating oversized recesses for deferred installation of floor insert sleeves, floor-insert penetrations and game lines and markers applied to finished flooring.

D. Samples for Initial Selection: For each type of gymnasium equipment indicated.

E. Samples for Verification: For the following products:

1. Pad Fabric: Not less than 3 inches (80 mm) square, with specified treatments applied. Mark face of material.
2. Volleyball Floor Insert: Full size unit.

F. Maintenance Data: For gymnasium equipment and gymnasium equipment operator to include in maintenance manuals.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer employing workers trained and approved by manufacturer.

B. Source Limitations: Obtain each type of gymnasium equipment through one source from a single manufacturer.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. Standards: Provide gymnasium equipment complying with or exceeding requirements of LHSAA.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not install gymnasium equipment until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Field Measurements: Verify position and elevation of floor inserts and layout for gymnasium equipment. Verify dimensions by field measurements.

1.7 COORDINATION

A. Coordinate installation of floor inserts with structural floors and finish flooring installation and with court layout and game lines and markers on finish flooring.

B. Coordinate layout and installation of overhead-supported gymnasium equipment and suspension system components with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Basketball/Volleyball Equipment and Safety Pads:

   a. AALCO.
   b. American Athletic, Inc.
   c. Bison Inc.
   d. Draper Inc.
   e. Jaypro Sports, Inc.
   f. Porter Athletic Equipment Co.

2.2 MATERIALS, GENERAL

A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated; mill finish or decorative, baked-enamel, powder-coat finish.

   1. Extruded Bars, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).

B. Steel: Comply with the following:

   1. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M, hot-dip galvanized.
   2. Steel Pipe: Standard-weight steel pipe complying with ASTM A 53.
   3. Cold-Formed Steel Tubing: ASTM A 500, Grade A, unless another grade is required by structural loads.
   4. Steel Mechanical Tubing: Cold-rolled, electric-resistance-welded carbon or alloy steel tubing complying with ASTM A 513 or steel tubing fabricated from steel complying with ASTM A 569/A 569M and complying with the dimensional tolerances in ASTM A 500.
   5. Malleable-Iron Castings: ASTM A 47 (ASTM A 47M), grade required by structural loads.
   6. Support Cable: 1/4-inch- (6-mm-) diameter, 7x19 galvanized steel aircraft cable with a breaking strength of 7000 lb (3175 kg). Provide fittings complying with cable manufacturer's written recommendations for size, number, and method of installation.
   7. Support Chain: Proof coil chain, complying with ASTM A 413/A 413M, Grade 30, size and diameter as required by structural loads; plated or painted. Provide fittings complying with chain manufacturer's written recommendations for size, number, and method of installation.

C. Wood-Based, Structural-Use Panels: Comply with DOC PS 2; for plywood, comply with DOC PS 1.

D. Equipment Mounting Pads: Wood, neutral color painted finish, size, and quantity as required to mount gymnasium equipment according to manufacturer's written recommendations.

E. Anchors, Fasteners, Fittings and Hardware: Manufacturer's standard corrosion-resistant or noncorrodible units; concealed tamperproof, vandal and theft resistant. Provide as required for gymnasium equipment assembly, mounting, and secure attachment.

F. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107 with minimum strength recommended in writing by gymnasium equipment manufacturer.

2.3 BASKETBALL EQUIPMENT

A. General: Provide equipment complying with requirements in "LHSAA Basketball Rule Book." Protruding fasteners or exposed bolt heads on front face of backboards are not permitted.

B. Overhead-Supported Backstop: Complete assembly spanning height indicated on Drawings, including primary and secondary superstructure support framing to building structure, pipe and cable bracing, adjustable hangers, clamps, cables, chains, pulleys, fittings, hardware, and fasteners.

1. Framing: Steel pipe, tubing, and shapes. Design framing to minimize vibration during play.

   a. Center Mast: Welded construction with side sway bracing of pipe.
   b. Finish: Manufacturer's standard factory-applied, baked powder-coating finish complying with finish manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness; color selected by Architect.

2. Folding Type: Provide manufacturer's standard assembly for forward-folding, rear-braced backstop, with hardware and fittings to permit folding.

C. Electric Operator: Provide factory-assembled electric operator for backstop designed for lifting and lowering basketball equipment of type, size, weight, construction, use, and operation frequency indicated. Provide operation system, of size and capacity and with features, characteristics, and accessories suitable for Project conditions, recommended by gymnasium equipment manufacturer; complete with winch or hoist designed to move and hold backstop in any raised or lowered position, electric motor and factory-prewired motor controls with limit controls, remote-control stations, remote-control devices, power disconnect switch, enclosures protecting controls and all operating parts, and accessories required for proper operation. Include wiring from motor controls to motor. Coordinate operator wiring requirements and electrical characteristics with the building electrical system.

1. Comply with NFPA 70.
2. Control Equipment: Comply with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6.
3. Winch: Consisting of heavy-duty, fully enclosed worm gear reducer, belt and sprocket drive, cable drum, cable, and fittings.
4. Electric Motor: UL-approved or -recognized, totally enclosed, insulated, capacitor-start motor, complying with NEMA MG 1, with thermal-overload protection, brake, and permanently lubricated bearings; sized to start and operate size and weight of basketball equipment considering Project's service conditions without exceeding nameplate ratings or considering service factor.

   a. Service Factor: According to NEMA MG 1, unless otherwise indicated.
   b. Motor Characteristics: Single phase, sized by gymnasium equipment manufacturer, 115 V, 60 Hz.

5. Operator Mounting: Wall, on equipment mounting pad.
6. Remote Controls: Electric controls with NEMA ICS 6, Type 1 enclosure for recessed or flush mounting.

   a. Control Stations: Manufacturer's standard keyed, momentary-contact, three-position, switch-operated control with up, down, and off functions; one switch per each backstop. Provide two keys per station.

7. Limit Switches: Adjustable switches, interlocked with motor controls and set to automatically stop basketball equipment at fully retracted and fully lowered positions.

D. Basketball Backboard: Provide predrilled holes or preset inserts for mounting goals.

1. Description: Rectangular, 72 by 48 inches (1800 by 1200 mm) width by height, fabricated from the following:

   a. Fiberglass (for four practice goals): Not less than 1-1/2-inch- (38-mm-) thick composite backboard consisting of not less than two 3/16-inch- (5-mm-) thick, molded fiberglass panels laminated together over faces and edges encapsulating a 3/4-inch (19-mm) honeycomb core, reinforced at goal and backboard mountings, or wood panel product core; with threaded inserts or embedded anchors for mounting backboard corners to backstop support framing at standard mounting centers.

      1) Standard Mount: Provide steel corner reinforcement with mounting slots for mounting backboard frame to backstop support framing at standard mounting centers.

      2) Target Area and Border Markings: Marked in orange, with manufacturer's standard pattern and stripe width.

   b. Glass (for two main gym goals): Not less than 1/2-inch- (12-mm-) thick, transparent tempered glass. Provide glass with impact-absorbing, resilient rubber or PVC gasket around perimeter in a fully welded brushed-natural-finish, extruded-aluminum frame, with steel subframe, reinforcement, and bracing, including center-strut frame reinforcement, and with mounting slots for mounting backboard frame to backstop support framing.

      1) Standard Mount: Provide steel corner reinforcement with mounting slots for mounting backboard frame to backstop support framing at standard mounting centers.

      2) Target Area and Border Markings: Permanently etched in white color, marked in manufacturer's standard pattern and stripe width.

2. Rim-Restraining Device: Complying with NCAA, NFHS and LHSAA rules and designed to ensure that basket remains attached if glass backboard breaks.

E. Goal Mounting Assembly: Compatible with goal, backboard, and support framing, with manufacturer's standard hole pattern for goal attachment.

   1. Glass Backboard Goal Mounting Assembly: Goal support framing and reinforcement designed to transmit load from goal to backboard frame and to minimize stresses on glass backboard.

F. Basketball Goals: Complete with flanges, braces, attachment plate, and evenly spaced loops welded around underside of ring.

   1. Single-Rim Basket Ring Competition Goal: Materials, dimensions, and fabrication complying with referenced rules per manufacturer's standard design.
   2. Type: Movable, breakaway design with manufacturer's standard breakaway mechanism including positive-lock, preset pressure release, set to release at 230-lb (105-kg) load, and automatic reset. Provide movable ring with rebound characteristics identical to those of fixed, nonmovable ring.
   3. Mount: Rear mount.
   4. Net Attachment: No-tie loops for attaching net to rim without tying .

5. Finish: Manufacturer's standard factory-applied, baked powder-coating finish complying with finish manufacturer's written instructions for surface preparation including pretreatment, application, baking, and minimum dry film thickness; orange.

G. Basketball Nets: 12-loop-mesh net, between 15 and 18 inches (400 to 450 mm) long, sized to fit rim diameter, and as follows:

1. Competition Cord: Antiwhip, made from white nylon cord not less than 120 gm nor more than 144 gm thread.

H. Safety Pads: Provide safety pads, complying with, designed for backboard thickness indicated and extending continuously along bottom and up sides of backboard and over goal mounting and backboard supports as required by referenced rules and per manufacturer's standard design.

1. Safety Pad Attachment: Manufacturer's standard.
2. Color: grey.

2.4 VOLLEYBALL EQUIPMENT

A. General: Provide equipment complying with requirements in "LHSAA Volleyball Rule Book."

B. Floor Insert: Chrome-finished steel floor plate; and steel pipe sleeve, concealed by floor plate, with capped bottom end, sized with ID to fit post standards, not less than 12 inches (305 mm) long to securely anchor pipe sleeve below finished floor in concrete footing; with anchors designed for securing floor insert to floor substrate indicated; quantity as indicated on Drawings.

1. Floor Plate: Manufacturer's standard hinged access cover, designed to be flush with adjacent flooring. Provide two tools for unlocking access covers.

2.5 WALL-MOUNTED AND POST COLUMN SAFETY PADS

A. Safety Pad Surface-Burning Characteristics: Provide safety pads with flame-spread index of 25 or less and smoke-developed index of 450 or less, as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

B. Pad Covers: Provide safety pad fabric covers fabricated from puncture- and tear-resistant, not less than 14-oz. (397-g) PVC-coated polyester or nylon-reinforced PVC fabric treated with fungicide for mildew resistance, with the fire-test-response characteristics indicated , lined with fire-retardant liner .

1. Flame-Resistance Ratings: Passes NFPA 701.

C. Wall Safety Pads: Padded wall wainscot panels designed to be attached in a continuous row; each panel section consisting of fill laminated to backer board with visible surfaces fully covered by seamless fabric cover, free from sag and wrinkles and firmly attached to back of backer board.

1. Backer Board: Not less than 3/8-inch- (9.5-mm-) thick plywood, mat-formed, or composite pane .
2. Fill: Multiple-impact-resistant foam not less than 2-inch- (50-mm-) thick polyurethane, 3.5-lb (1.6-kg) density .
3. Size: Each panel section, 24 inches (600 mm) wide by not less than 96 inches (2440 mm) long as indicated on Drawings .

4. Number of Panel Sections: As indicated on Drawings modular panel sections.
5. Installation Method: Manufacturer's standard.
6. Fabric Cover Colors: Match school colors; as selected by Architect from manufacturer's full range for two color s .

D. Column Safety Pads: Pads covering exposed columns (flange and webs) height indicated, consisting of not less than 1-1/4-inch- (32-mm-) thick, multiple-impact-resistant, closed-cell polyethylene-foam filler, covered both sides and all edges of pad by fabric cover with self-adhesive hook-and-loop attachment to exposed face of column.

1. Length: Each pad shall be 128 inches (3251 mm) as indicated on Drawings.
2. Fabric Cover Color: Match school colors; as selected by Architect from manufacturer's full range for one color.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for play court layout, alignment of mounting substrates, installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance.

1. Verify critical dimensions.
2. Examine supporting structure and below finished floor for subgrades, subfloors and footings.
3. Examine wall assemblies, where reinforced to receive anchors and fasteners, to verify that locations of concealed reinforcements have been clearly marked for installers. Locate reinforcements and mark locations if not already done.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. General: Comply with manufacturer's written installation instructions and competition rules indicated for each type of gymnasium equipment . Complete equipment field assembly, where required.

B. Unless otherwise indicated, install gymnasium equipment after other finishing operations, including painting, have been completed.

C. Permanently Placed Gymnasium Equipment and Components: Rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated on Shop Drawings; in proper relation to adjacent construction; and aligned with court layout.

1. Floor Insert Location: Coordinate location with application of game lines and markers.
2. Floor Insert Elevation: Coordinate installed heights of floor insert with installation and field finishing of finish flooring and type of floor plate.
3. Operating Gymnasium Equipment: Verify clearances for movable components of gymnasium equipment throughout entire range of operation and for access to operating components.

D. Floor Insert Setting: Grout sleeve for post standards in oversized, recessed voids in concrete slabs and footings . Clean holes of debris. Position sleeve and fill void around sleeves with grout, mixed and placed to comply with grout manufacturer's written instructions. Protect

portion of sleeve above subfloor and footing from splatter. Verify that sleeves are set plumb, aligned, and at correct height and spacing; hold in position during placement and finishing operations until grout is sufficiently cured. Set insert so top surface of completed unit is flush with finished flooring surface.

E. Wall Safety Pads: Mount with bottom edge at 4 inches (100 mm) above finished floor.

F. Anchoring to In-Place Construction: Use anchors and fasteners where necessary for securing built-in and permanently placed gymnasium equipment to structural support and for properly transferring load to in-place construction.

G. Connections: Connect automatic operators to building electrical system.

H. Portable Gymnasium Equipment and Components: Assemble in place to verify that equipment and components are complete and in proper working order. Instruct Owner's designated personnel in properly handling, assembling, adjusting, disassembling, transporting, storing, and maintaining units. Disassemble portable gymnasium equipment after assembled configuration has been approved by Architect, and store units in location indicated on Drawings.

3.3 ADJUSTING

A. Adjust movable components of gymnasium equipment to operate safely, smoothly, easily, and quietly, free from binding, warp, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and moving parts.

3.4 CLEANING AND PROTECTION

A. After completing gymnasium equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer's written instructions.

B. Provide final protection and maintain conditions acceptable to manufacturer and Installer that ensure gymnasium equipment is without damage or deterioration at time of Substantial Completion.

C. Replace gymnasium equipment and finishes that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain gymnasium equipment. Refer to Division 1 Section "."

END OF SECTION 11490

SECTION 12000 - LIBRARY FURNITURE

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Extent of wood library furniture as indicated on Drawings.

1.2 REFERENCES

A. Architectural Woodwork Institute Quality Standards

1.3 SUBMITTALS

A. All prospective bidders must submit a sample section of shelving, table corner unit and a library chair showing the construction of the furniture exactly as it will be furnished. Bidder also must submit samples showing materials and construction proposed to be used on the job along with manufacturer's specifications and installation instructions for each type of library furniture. All samples must either meet or exceed the specified standards.

B. Submit 6" x 6" samples of each exposed finish required.

C. Submit shop drawings for each type of library furniture, showing details, dimensions, and layout of installation. Shop drawings must include rough-ins for wiring. Coordinate shop drawings with other involved.

D. Submit manufacturers installation instructions and recommendations.

E. All questions must be answered in detailed written form to remove confusion or doubt over what is to be provided.

1.4 QUALITY ASSURANCE

A. It is the intent of these specifications to establish a minimum standard of quality acceptable to the owner for materials, hardware, finish, construction methods, design and function as well as craftsmanship of wood library furniture.

B. Only qualified wood library furniture manufacturers with a minimum of ten years experience manufacturing wood library will be allowed to bid providing compliance with these specifications is adhered to. A bidder proposing a change, modification, or substitution must clearly state variances to these specifications listed herein.

C. All work, material and equipment must be of the highest quality. All woodwork must be designed and finished to blend uniformly. In keeping with the highest standards of quality control and technical library furniture construction, careful detail must be given to the close matching of finish and veneers and all component parts.

D. Manufacturer must provide a minimum of five year warranty of all furniture included in this section.

E. Installer: Installation must be by the manufacturer's authorized representative and must conform to the manufacturer's standard procedure. Installer must have a minimum of ten years documented experience installing library furniture.

F. Drawings and Specifications: Plans, elevations, details and specifications indicate components, material, fabrication,. And similar design requirements for library furniture. Minor deviations will be accepted in order to utilize manufacturer's standard products when in Architect's sole judgement such deviations do not materially detract from design concept or intended performance.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver library furniture only after all painting, wet work, grinding and similar operations are complete.

B. Do not deliver or install equipment until following conditions are met:

1. Windows and doors are installed and the building is secure and weather tight.

2. Ceiling, overhead, ductwork and lighting are installed.

3. All painting is completed and carpet is installed.

4. Environmental Conditions: Building temperature must not exceed 80 degrees (F) to avoid undue drying of materials used in wood furniture and subsequent damage by structural fatigue. Avoid frequent and/or excessive changes in temperature and or humidity levels during the course of the material installation or once materials are installed to prevent damage to equipment. Under no conditions should moisture levels exceed 60% relative humidity in order to avoid undue stress or splitting of wood materials.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products from one of the following:

1. Tesco Industries, Inc.
2. Texwood Furniture Corporation

B. Specific requirements set forth in the specifications are given for purposes of establishing a minimum standard of design and quality for materials, construction and workmanship.

2.2 MATERIALS

A. Wood Species and Material: Exposed woods shall be northern red oak hardwood free of imperfections and will be carefully selected for uniformity of grain, texture and figure. All hardwoods must be well air seasoned and then kiln dried and stabilized to a moisture content of approximately 6-7%. Wood used for internal parts shall be selected as structurally sound.

B. Veneers:

1. Exposed veneers must be premium, "A" grade, northern red oak, custom matched for uniform color and pleasing effect, plain sliced with a narrow heart. All edges of the veneers must be glued on a tapeless splicer.

2. Face must be free of wild grain, wide heart and gross figure on either side of cathedral figure. <u>No rotary cut or peeled veneers shall be used on exposed surfaces.</u>

3. All circulation desk fronts must utilize premium grade rift cut veneers to control quality and ensure matching.

4. Veneers must be matched and joined in such a manner as to prevent lap or open joints. No tape shall be permitted on the glued line. Bonding agent shall have the same water resistance as the bonding agent used in lumber core construction.

2.3 WOOD FINISH

A. All furniture must be quality inspected in the white wood prior to entering the finishing system. The finishing process must utilize high temperature-high velocity ovens for curing the finish. Air-dried finishes are not acceptable.

B. Due to the high quantity of harmful emissions emitted into the atmosphere by solvent based finishes, water based coatings will be preferred over solvent based coatings.

C. All furniture must be hand sanded with a fine grit abrasive and inspected thoroughly for excess glue and other imperfections. After final white wood inspection, one coat of non-grain raising pigmented toner must be applied to provide maximum uniformity and fade resistance. A coat of stain must be performed as required, depending on the particular color involved.

Next, at least one coat of high quality sealer must be applied and hand sanded to achieve maximum smoothness of finish.

The final coat of finish, must be applied and "oven cured" to obtain a highly chemical and mar resistant coating (air-dried finishes are not acceptable).

D. The following test was conducted by Lilly Industries, Inc. and the results are listed below. Any finish that does not meet these criteria is not acceptable.

The test performed, consisted of placing a spot of chemical and household reagents on the surface of coating and letting it evaporate.

Reagent	Effect
Naphtha	Pass
Alcohol	Pass
Olive Oil	Pass
Coffee	Pass
Tea	Pass
Shoe Polish	Pass
Detergent	Pass
Ketchup	Pass
Ink	Pass
Other Tests:	
Cold Check Resistance (20 Cycles)	Pass
Scratch Resistance	Pass
Crosshatch Adhesion	Pass
Boiling Water, poured on surface and allowed to cool	Pass

2.4 (SEVEN PLY) SOLID NORTHERN HARDWOOD VENEER CORE

A. Solid northern hardwood veneer core panels must be constructed of an odd number of hardwood veneer plies with face and back northern red oak veneers. Each ply is applied at

right angles to the grain of the adjacent ply to resist warping. All plies are to be hardwood free from blisters, wrinkles, laps and other defects.

2.5 (THREE PLY) STRUCTURAL PANEL CORE

A. Solid structural panels must be constructed of wood chips bonded with a water-resistant adhesive. These solid cores of no less than 45 lb. medium density fiberwood (MDF) or particleboard (MDP) must have northern red oak veneers applied on exposed panels. The physical properties of these cores must meet or exceed American National Standard specifications ANSI 208.1 and/or ANSI 208.2.

2.6 HIGH PRESSURE LAMINATE

A. Where specified for work or top surfaces, high-pressure laminate must be .050” thick and used with an appropriate backer sheet. High-pressure laminate shall be of maximum hardness to resist scratches, marring, fading, staining, etc. and shall comply with performance standards set by the National Electric Manufacturers Association. NEMA-LDI-1964, LD-3 GP50.

2.7 HARDBOARD

A. Where specified, hardboard must be composed of compressed wood fibers, pressed by hydraulic pressure into homogeneous sheets of 1/4" in overall thickness.

2.8 HARDWARE

A. Must be of modern design, constructed to meet the requirements of institutional furniture equipment.

2.9 JOINERY

A. All joints are glued, pinned, and/or screwed. All joints shall be as used in standard woodworking practice including dovetail, spline, rabbet, mortise and tendon. All framing shall be of kiln-dried hardwood selected for structural soundness and shall be a minimum of 3/4" thick

2.10 FABRICATION

A. Modular Wood Shelving

1. Shelving must be sectional in construction for maximum flexibility in arrangement. Heights and depths must be as specified. There must be one started section for each range of shelving and all other sections in the range will be adder sections. A starter section of shelving will consist of two ends, a top filler, a base and shelves. It must be 37-1/4” wide overall. An adder section must consist of one intermediate upright, a top filler, a base and shelves. It will be 36” wide overall. All end panels, top fillers, and center panels must be manufactured to allow backs to be added later, as needed, for wall or freestanding shelving. All shelves must be adjustable on 32 mm centers vertically (metal strips with clips will not be considered acceptable).

2. End panels must be constructed of 1” thick three-ply structural panel core in flush panel design. Panels must receive Grade A maple veneers and all exposed verticle edges must be banded with ¼” solid maple. Top edges of 42” and 60” high sections must be banded with ¼” solid maple. All panels will be the full dimensions specified.

3. Intermediate uprights must be constructed of ¾” thick three ply structural panel core in flush panel design. Panels must receive Grade A hard maple veneers and all exposed vertical edges must be banded with ¼: solid maple. Top edges of 42” and 60” high sections must be banded with ¼” solid maple. All panels will be the full dimensions specified.

4. Cornice tops must be constructed of ¾” three ply structural panel core. Cornice top rail must be solid northern red oak 2-3/4” wide and designed to fit flush with the top edge of ends and intermediate uprights. Top mounting is with solid maple blocks with all metal-to-metal fastening. High-pressure laminate top fillers must be provided on all 42” and 48” high shelving.

5. Bases must be constructed of a 3-1/4” x ¾” three ply structural panel core with solid maple mounting blocks and wood stretchers.

6. Cornice tops and bases must attach to end and center panels with 5/16” bolts for all metal-to-metal attachment (lag bolts or wood to metal contact will not be considered acceptable). Base shelf must be same construction as adjustable shelves for ease in assemble and uniformity.

7. Shelves must be constructed of full width glued-up strips of northern hardwood no more than 3” and no less than 1” wide. Shelves must be ¾” thick x 35-1/8” long. The underside of all shelves must be notched to fit over the shelf pins. Notches must be only of sufficient length to accommodate the pin and shall be closed at one end to prevent accidental shelf dislodgment of shelf pins. Actual dimension must be as follows: 10” shelves to be 9-1/4” minimum; 12” shelves to be 11-1/4” minimum.

8. Back panels must be constructed of ¼” thick matching red oak wood grain. Dividers for double-faced unites must be finished on both sides. Backs for single faced unites must be finished on one side.

B. (Modular) Circulation Desk

1. Individual circulation desktops must be 1-1/4" thick internally with the patron side receiving an outward radius design. Front and back edge of work surface must receive a 1/4” thick solid oak edge band. Continuous tops are not acceptable. Top surfaces must receive .050" thick high-pressure laminate and must be used with an appropriate backer sheet.

2. All modular circulation desk units must be constructed of 3/4" three ply structural panel core panels, modular in design and fully assembled. Standard units are 36" wide x 30" deep x 38" high. All units must receive 3" diameter grommets in each side panel to allow for wire pass through. All units must have a closed base with a recessed toe space 4" high and 3" deep across the front. Each unit shall be separated by a full height 3/4" panel on each side with rounded corners and edges.

3. The front of each circulation desk unit must receive a high-pressure laminate inlay 6” high that extends the width of each unit (color to be selected by owner).

4. In order to control quality and ensure matching all charge desk fronts must utilize premium hand picked rift cut veneers.

5. Component parts must be solid wood (melamine, metal, or PVC construction are not acceptable). Cabinets must be joined to each other with connector bolts and connector nuts for all metal to metal contact. Wood screws will not be an acceptable means of attachment. Corner sections must be joined by means of connector bolts screwing into

"T" nuts embedded in the corner section. One pair of End Panels are required for each complete assembly.

6. All adjustable shelves must be adjustable on 32-mm centers with steel pin supports. Metal strips with clips will not be considered acceptable.

7. Each door storage module must have a pair of matched doors 3/4" thick, three-ply structural panel core with premium grade red oak face veneers. Each hinged door must mount to the cabinet by means of concealed hinges, which open 170 degrees (exposed hinges will not be considered acceptable). Sliding doors slide in wood door track.

8. All drawer fronts must be 3/4" three ply structural panel core with select premium Grade oak veneer on both faces. Drawer box must be constructed of 1/2" hardwood with dovetailed joints. The drawer bottoms must be 1/4" plywood. The bottom shall set into dadoes routed in side, back and front and reinforced with glue blocks. The drawers must operate on side mounted nylon roller extension slides having a load capacity of 50 lb. per drawer.

PART 3 – EXECUTION

3.1 INSPECTION

A. Verify that the existing conditions are ready to receive work.

B. Beginning of installation shall mean that installer accep existing conditions.

3.2 INSTALLATION

A. Install items in accordance with manufacturer's instructions and recommendations. Provide all hardware necessary to secure and install all items.

B. Allow for connection of electrical work. Coordination of all contractors involved is required.

C. Coordinate with related items such as blocking and furring.

D. All shelving and other furniture shall be carefully adjusted to the floor and leveled. Wall shelving shall be attached to the walls at the most inconspicuous locations and in a manner to ensure a secure attachment.

E. Install plumb, level true and straight with no distortions. Where equipment abuts other furnished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, top closures and moldings as indicated or required, and finish to match.

F. Anchor cabinets securely in place with concealed (wen doors and drawer are closed) fasteners, anchored into structural support members or wall construction. Comply with manufacturer's instructions for support of units.

G. Complete hardware installation and adjust doors and drawers for proper operation.

G. Modular Shelving: install all adjustable shelves at equal spacing unless otherwise indicated.

3.3 CLEANING AND PROTECTION

A. Repair or remove and replace defective work as directed upon completion of installation. Verify that moving parts are operating freely.

B. Clean exposed and semi-exposed surfaces, polish all wood surfaces, touch-up as required or replace components as necessary to eliminate evidence of damage or deterioration.

C. Protection: Advise contractor of final protection and maintained conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.

3.4 SCHEDULE

ITEM	QTY	TESCO MODEL #	DESCRIPTION	SIZE
1	29	4500 Series	Shelving: Starter Adder Style – Single Face with shelving, canopy top style	36x72x12
2	6	4500 Series	Shelving: Starter Adder Style – Double Face with shelving, canopy top style, back panel	36x72x24
3	3	4500 Series	Shelving: Starter Adder Style – Single Face with shelving, canopy top style	36x42x12
4	30	4500 Series	Shelving: Starter Adder Style – Double Face with shelving, canopy top style, back panel	36x42x24
5	2	4500 Series	SHLV SF STARTER-MAGAZINE RACK	36x72x12
6	1	4500 Series	SHLV COMBINATION MAGAZINE / NEWSPAPER SHELVING WITH SLOPING SHELVING AND RODS	36x72x12
7	4	4211-193-112 SIM	COMPUTER TABLE-LEG BASE TABLE CARREL WITH WORK SURFACE AT 36”	36x36x30

ITEM	QTY	TESCO MODEL #	DESCRIPTION	SIZE
8		4400	CIRCULATION DESK ASSEMBLY-MODULAR COMPONENTS	
			HPL CONTINUOUS TOP - BULLNOSE EDGE	
9	1	4438	STORAGE-TWIN DRAWER-HINGED DOORS-1 ADJ SHLF-LK	36x39x30
10	1	4444	BOOK RETURN UNIT-FRONT BOOK SLOT	36x39x30
			GROMMET-VINYL J- MOLD	
11	1	4460	STORAGE-TWO DRAWER-OPEN-1 ADJ SHLF-LOCK	36x39x30
12	2	4446	CORNER-CURVED - CLOSED FRONT	30x39x30
13	1	4463	DESK-LEVEL TOP KNEE SPACE-GROMMET	36x32x30
14	1	4481	FINISHED END PANEL	
	1	4481	FINISHED END PANEL	
15	1	4445	DEPRESSIBLE BOOK TRUCK	27x27x22
16	1	4330-060-310	ATLAS STAND-LEG BASE-5 PULLOUT SHLVS-BN TOP	30x42x30
17	1	4340-060-310	DICTIONARY STAND-LEG BASE-1 ADJ SHLF-BN TOP	24x42x16

END OF SECTION 12000

SECTION 12322 - PLASTIC-LAMINATE LABORATORY CASEWORK

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. Plastic-laminate laboratory casework.
2. Laboratory countertops.
3. Mobile storage units, tables and components.

1.3 DEFINITIONS

A. Exposed Portions of Casework: Surfaces visible when doors and drawers are closed, including bottoms of cabinets more than 1200 mm above floor, and visible surfaces in open cabinets or behind glass doors.

1. Ends of cabinets, including those installed directly against walls or other cabinets, shall be considered exposed.

B. Semiexposed Portions of Casework: Surfaces behind opaque doors, such as interiors of cabinets, shelves, dividers, interiors and sides of drawers, and interior faces of doors. Tops of cases 78 inches (1980 mm) or more above floor are defined as semiexposed.

C. Concealed portions of casework include sleepers, web frames, dust panels, and other surfaces not usually visible after installation.

1.4 SUBMITTALS

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

B. Shop Drawings: For plastic-laminate laboratory casework. Include plans, elevations, sections, details, and attachments to other work.

1. Indicate locations of blocking and reinforcements required for installing laboratory casework.
2. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and other laboratory equipment.
3. Include coordinated dimensions for laboratory equipment specified in other Sections.

C. Samples for Initial Selection: Plastic laminate for cabinets and countertops, and other accessories required for casework.

D. Samples for Verification: Unless otherwise directed, approved Sample units may become part of the Work. Notify Architect of their exact locations. If not incorporated into the Work, retain acceptable Sample units at Project site and remove when directed by Architect.

1. One full-size, finished base cabinet complete with hardware, doors, and drawers, but without countertop.
2. One full-size, finished wall cabinet complete with hardware, doors, and adjustable shelves.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain laboratory casework, including countertops and accessories, through one source from a single manufacturer.

B. Product Designations: Drawings indicate sizes and configurations of laboratory casework by referencing designated manufacturer's catalog numbers. Other manufacturers' laboratory casework of similar sizes, similar door and drawer configurations, and complying with the Specifications may be considered. Refer to Division 1 Section "Product Requirements."

C. Product Standard: Comply with SEFA 8, "Laboratory Furniture--Casework, Shelving and Tables--Recommended Practices."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.

B. Deliver completed laminate clad casework, countertops, and related products only after wet operations in building are completed, store in ventilated place, protected from the weather, with relative humidity range of 20 percent to 50 percent.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install plastic-laminate laboratory casework until building is enclosed, wet work and utility roughing-in are complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.8 WARRANTY

A. Lifetime Guarantee and Limited Warranty to the owner against defective material and fabrication for as long as they own the product. This is a warranty of replacement and repair only, manufacturer shall correct defects in material and/or fabrication without charge.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Plastic-Laminate-Faced Casework:

a. Case Systems Inc.
b. TMI Design Systems Corp.

2.2 CABINET MATERIALS

A. General:

1. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.

B. Exposed and Semiexposed Materials:

1. Plastic Laminate: Type VGS.

a. Colors: As selected by Architect from manufacturer's full range.

C. Concealed Materials:

1. Solid Wood: Any hardwood or softwood species, with no defects affecting strength or utility.
2. Plywood: Hardwood plywood complying with HPVA HP-1.
3. Plastic Laminate: Type BKL.
4. Particleboard: ANSI A208.1, Grade M-2.
5. Medium-Density Fiberboard: ANSI A208.2, Grade MD.
6. Hardboard: AHA A135.4, Class 1 tempered.

2.3 CABINET DESIGN

A. Flush overlay.

2.4 CABINET FABRICATION

A. Construction: Provide plastic-laminate-faced laboratory casework of the following minimum construction:

1. Bottoms and Ends of Cabinets, Shelves, and Tops of Wall Cabinets and Tall Cabinets: 3/4-inch- (19-mm-) thick particleboard, plastic-laminate faced on exposed surfaces.
2. Backs of Cabinets: 1/2-inch- (12.7-mm-) thick particleboard, plastic-laminate faced on exposed surfaces.
3. Drawer Fronts: 3/4-inch- (19-mm-) thick particleboard, plastic-laminate faced on both sides.
4. Drawer Sides and Backs: 1/2-inch- (12.7-mm-) thick solid wood or plywood, with glued dovetail or multiple-dowel joints.
5. Drawer Bottoms: 1/4-inch- (6.4-mm-) thick plywood glued and dadoed into front, back, and sides of drawers. Use 1/2-inch- (12.7-mm-) thick material for drawers more than 24 inches (600 mm) in width.
6. Doors 48 Inches (1200 mm) or Less in Height: 3/4 inch (19 mm) thick, with particleboard or medium-density fiberboard cores, solid wood stiles and rails, and plastic-laminate faced on both sides.
7. Doors More Than 48 Inches (1200 mm) in Height: 1-1/16 inches (27 mm) thick, with honeycomb cores, solid hardwood stiles and rails, and plastic-laminate faced on both sides.

B. Filler Strips: Provide as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as cabinet fronts.

2.5 CABINET HARDWARE

A. General: Provide laboratory casework manufacturer's standard satin-finish, commercial-quality, heavy-duty hardware complying with requirements indicated for each type.

B. Hinges: Stainless-steel, 5-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide 2 for doors 48 inches (1200 mm) or less in height; 3 for doors more than 48 inches (1200 mm) in height.

C. Pulls: Solid aluminum, stainless steel, or chrome-plated brass; fastened from back with two screws. For sliding doors, provide stainless-steel or chrome-plated recessed flush pulls. Provide 2 pulls for drawers more than 24 inches (600 mm) in width.

D. Door Catches: Nylon-roller spring catch or dual, self-aligning, permanent magnet catch. Provide 2 catches on doors more than 48 inches (1200 mm) in height.

E. Drawer Slides: Powder-coated, full-extension, self-closing, heavy-duty drawer slides, designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05091, and rated for 120 lbf (530 N).

F. Locks: Cam type, brass with chrome-plated finish; complying with BHMA A156.11, Type E07281.

1. Provide minimum of two keys per lock and two master keys. Key Casework differently per room. Lock core shall be removable with a control key, permitting Owner to easily change lock arrangements without tools.
2. Provide on all drawers and doors.

G. Adjustable Shelf Supports: Mortise-type, powder-coated steel standards and shelf rests complying with BHMA A156.9, Types B04071 and B04091.

2.6 COUNTERTOPS

A. Countertops, General: Provide units with smooth surfaces in uniform plane free of defects. Make exposed edges and corners straight and uniformly beveled. Provide front and end overhang of 1 inch (25 mm), with continuous drip groove on underside 1/2 inch (13 mm) from edge.

B. Plastic-Laminate Countertops:

1. Countertops: Plastic-laminate sheet, complying with NEMA LD 3, shop bonded with waterproof adhesive to both sides of 1-3/16-inch- (30-mm-) thick core. Sand surfaces to which plastic laminate is to be bonded.
2. Plastic-Laminate Type for Formed Countertops: HGP.
3. Countertop Core: Particleboard complying with ANSI A208.1, Grade M-2.
4. Adhesive for Bonding Plastic Laminate: Urea-formaldehyde.
5. Colors, Textures, and Patterns: As selected by Architect from plastic-laminate manufacturer's full range.
6. Construct top and backsplash from one piece of plastic laminate with rolled front and top edges and coved intersection. Provide separate end splashes of same material as top, fitted to top, where indicated. Finish exposed ends with same plastic laminate as top.

2.7 ACCESSORIES

A. Reagent Shelves: Provide as indicated, fabricated from same material as adjacent countertop, unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of plastic-laminate laboratory casework.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF CABINETS

A. Install level, plumb, and true; shim as required, using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.

B. Base Cabinets: Adjust top rails and subtops within 1/16 inch (1.5 mm) of a single plane. Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions with fasteners spaced not more than 24 inches (600 mm) o.c. Fasten adjacent cabinets together with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16 inch (1.5 mm).

C. Wall Cabinets: Adjust fronts and bottoms within 1/16 inch (1.5 mm) of a single plane. Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 24 inches (600 mm) o.c. Align similar adjoining doors to a tolerance of 1/16 inch (1.5 mm).

D. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.

E. Adjust laboratory casework and hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.

3.3 INSTALLATION OF COUNTERTOPS

A. Abut top and edge surfaces in one true plane with flush hairline joints and with internal supports placed to prevent deflection. Locate joints only where shown on Shop Drawings.

B. Field Jointing: Where possible, make in the same manner as shop jointing using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop.

1. Use concealed clamping devices for field joints in plastic-laminate countertops. Locate clamping devices within 6 inches (150 mm) of front and back edges and at intervals not exceeding 24 inches (600 mm). Tighten according to manufacturer's written instructions to exert a uniform heavy pressure at joints.

C. Fastening:

1. Secure countertops, except for epoxy countertops, to cabinets with Z-type fasteners or equivalent, using two or more fasteners at each cabinet front, end, and back.
2. Where necessary to penetrate countertops with fasteners, countersink heads approximately 1/8 inch (3 mm) and plug hole flush with material equal to countertop in chemical resistance, hardness, and appearance.

D. Seal unfinished edges and cutouts in plastic-laminate countertops with a heavy coat of polyurethane varnish.

E. Provide scribe moldings for closures at junctures of countertop, curb, and splash, with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.

F. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

3.4 INSTALLATION OF ACCESSORIES

A. Install accessories according to Shop Drawings and manufacturer's written instructions.

3.5 CLEANING AND PROTECTING

A. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

B. Protect countertop surfaces during construction with 6-mil (0.15-mm) plastic or other suitable water-resistant covering. Tape to underside of countertop at minimum of 48 inches (1200 mm) o.c.

3.6 CASEWORK SCHEDULE – Refer to drawings for types, sizes and locations of casework.

END OF SECTION 12363

SECTION 12326 – MUSICAL INSTRUMENT LOCKERS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes musical instrument locker system.

B. Products Furnished and Installed Under this Section:
1. All music instrument lockers as shown on the drawings and specified herein.
2. All mounting and connection hardware and accessories.

1.3 REFERENCES

A. American Laminators Assoc. Performance Standard ALA 1985.

B. ANSI – BHMA Standard A 156.9, Grade 1

1.4 SYSTEM DESCRIPTION

A. Design Requirements:
1. Music education system of storage cabinets will be specifically designed and engineered for the intended use and will meet the minimum performance characteristics specified herein. Music instrument storage units will be chip and abrasion resistant under normal usage and will protect instruments and cases from damage under normal use.
2. Provide one-piece high molecular polyethylene instrument storage shelving with integral ventilation grooves, designed and engineered to withstand continuous use without surface or front edge breakdown.
3. Individual instrument storage cabinets will be manufactured with thermofused polyester laminated panels, finish both faces all components. Al end panels to be factory jigged and drilled to accept unit-to-unit through-bolting: no conventional wood screws attaching units side to side will be permitted. Each instrument storage cabinet will be furnished with an integral base and four (4) steel levelers accessible from within the unit but concealed in final installation. These features combine to provide modularity, on-site rearrangement or future relocation of any music education storage cabinet.
4. Provide inset style door panels, wire grille face; reveal or full overlay style solid or wire grille doors will not be permitted due to inherent weakness of overlay hinges. All hinges shall be structurally attached to vertical panels using engineered and tested through-bolt hardware, and welded to wire grille doors; screw mounted hinges will not be permitted.

B. Manufacturer to Provide Documentation of Following Minimum Performance Requirements:
1. Molded plastic instrument storage shelf shall have a static load capacity of over 1,000 lbs.
2. Wire grille door hinge to be welded to door frame in 5 places, pull tested to withstand 3,000 lbs.

3. Instrument storage shelf system shall have a factory warranty of ten (10) years against defects in material and/or workmanship.

1.5 SUBMITTALS

A. Product Data: Submit applicable reference standards, performance and test data, and application recommendations and limitations.

B. Shop Drawings: Submit design and installation drawings showing product components in assembly with adjacent materials and products. Shop drawings shall clearly indicate on the shop drawings the actual instrument capacity (types, sizes and numbers of instrument types) of the design shown.

C. Quality Control Submittals:
1. Manufacturer's Installation Instructions.

D. Contract Closeout Submittals:
1. Maintenance recommendations.
2. Warranty.

1.6 DELIVERY, STORAGE AND HANDLING

A. Pack and ship to avoid damage according to manufacturer's recommendations:
1. Finish and assembly components in factory before shipment.
2. Ship components in individual, sealed, labeled cartons.
3. Deliver components to room designated for installation.

B. Do no accept or install damaged products at the site.

C. Store products in heated indoor storage near point of installation. Retain protective packaging until installing.

1.7 PROJECT CONDITIONS

A. Environmental Requirements: Do not install cabinets until all mortar, et and dust producing work is completed.

B. Field Measurements: Obtain required field measurements from the Contractor and indicate on Shop Drawings.

1.8 WARRANTY

A. Provide manufacturer's written warranty that products not in accordance with requirements of Contract Documents within three years after commencement of warranties shall be corrected promptly after receipt of written notice from Owner. Cabinet shelf will be warranted for ten years.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. WENGER CORPORATION, 555 Park Drive, Owatonna, MN 55060, 507/455-4100 or Case Systems.

B. Manufacturers offering substitute products must obtain approval prior to bidding or must offer voluntary alternates under provisions of Instructions to Bidders.
   1. Manufacturer requesting prior approval must submit evidence of minimum 10 years experience manufacturing musical instrument storage.
   2. Manufacturer requesting prior approval must submit performance documentation and/or test results as noted above, plus actual samples of materials, construction features and finishes, specifically but not necessarily limited to the following:
      a. Typical shelf and mounting details.
      b. Cabinet wall panel complete with surface finish and edging.
      c. Door panel, both solid and wire grille if applicable.
      d. Hinges, preferably mounted to door sample.
      e. Slide bolts/latch mechanism.

      Samples may be impounded for retention at job site to assist the submittal/field inspection process; solely at discretion of architect and/or owner.

2.2 MATERIALS

A. Cabinet Wall Panels: ¾ inch thick industrial (cabinet) grade particleboard, minimum 48 pcf with thermoset polyester (melamine not acceptable) laminate on both sides for totally finished construction. No backer sheets or unfinished surfaces may be used on unexposed sides. Color: oyster.

B. Cabinet Shelving:
   1. Cabinets up to 27 inches wide: One-piece high molecular blow-molded polyethylene with 1-3/8 inch radius front edge (Patented). Mount to cabinet walls with one-piece molded rigid St nylon clip. Shelf is replaceable without damage to adjacent surfaces. Doweled shelves will not be permitted.
   2. Cabinets over 27 inches wide: One-piece high molecular formed polyethylene with radius front edge and 3/16” wall thickness. Ribbed for structural integrity. Supported by four structural tubular members 1-1/2” x 1” x 16 Ga. Wall thickness with 14 gauge welded end plates.

B. Door Options:
   1. Grille doors: Welded steel grille construction with powder coat finish, color: oyster. Welds at T-joints must be 360 degrees.
      a. Hinges, 5-knuckle institutional type hinge, supplied by ISO 9002 vendor. Hinge will support 315 lbs. Dynamic vertical load. Hinge pin shall be 2-3/4” long. Hinge welded to door frame in five places. Fastened to cabinet with through-bolt construction; attachment by wood screws not acceptable. Finish: oyster powder paint. Two hinges on compartment doors, four on full height doors.

   2. Locking slide-bolt: All doors shall be factory provided with locking slide-bolt designed for padlocks, with formed steel strike plate through-bolt connected to cabinet end panel; 12 gauge steel. Provide clear plastic label holder for identification card insert. Finish: Powder paint coating: color: oyster.

C. Edging: Heat bonded 3 mm beveled PVC edge-banding, machine applied using hot-melt adhesives, edges and corners machine profiled for safety, integral color: oyster.

E. Finish Hardware:
   1. Joinery Hardware: two inch, ¼-20 oak connectors with 15 mm head diameter, and steel thread inserts shall be utilized to join desired cabinets side-to-side; use factory jigged and drilled joinery holes. Finish: Powder paint coating, color: oyster.

2. Cabinet levelers: Structural levelers each cabinet, accessible from with the unit when desired, concealed in complete installation; glides with minimum 3/8 inch diameter threaded rod mounted in steel corner brackets. Provide minimum four glides per cabinet, six glides for cabinets with divider panels.

E. Cabinet Back Panel:

1. Standard cabinet back to be ¼" thick prefinished hardboard, color: oyster to match interior of side and top panels.

2.3 MANUFACTURED UNITS

A. Fabricate and package all components in the factory and ship fully assembled.

2.4 CLOSURE OPTIONS REQUIRED

A. Vertical Closure Kit: Provide visual closure between wall and cabinet. Constructed of ¾" thick thermoset polyester composite wood to match cabinet side panels. Colors: oyster. Will fit ¾" to 30" wide opening.

B. Top Back Filler it: Provide visual closure between back wall and top panel of cabinet. Constructed of ¾" thick thermoset polyester composite wood to match cabinet top panels. Color: oyster. Will fit 10" and 20" deep openings.

2.5 DELIVERY/INSTALLATION

A. Freight and installation is to be included in bid to General Contractor.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Installation in accordance with manufacture's instructions. Securely anchor to masonry wall with toggle bolts.

3.2 ADJUSTING

A. Adjust all hardware for smooth operation.

3.3 CLEANING

A. Clean all surface of soil.

B. Remove all packaging materials and construction debris.

END OF SECTION 12326

SECTION 12348 - WOOD LABORATORY CASEWORK & FURNISHINGS

PART 1 - GENERAL REQUIREMENTS:

1.01 GENERAL REQUIREMENTS

1. Drawings and general provisions of the Contract, including General and Supplementary conditions and Division 1 Specifications sections, apply to this Section.

1.02 PRODUCT:

1. Wood laboratory casework and equipment covered by this specification and/or equipment schedule, and accompanying drawings to be the product of one manufacturer or dealer thereof and shall be supplied under his direction to eliminate divided responsibility, unless directly called out in Contract Documents to be of another manufacturer or dealer thereof.

   B. Refer to details and/or equipment schedule for location of materials to be provided. Although not necessarily shown on details or listed in schedule, casework supplier must provide all materials necessary (i.e. finished ends, finished backs, fillers, scribes, etc.) to make for a complete installation.

2. Bidders must be prepared to show the following proof of their ability to perform under this contract. Failure to meet requirements and qualifications will be sufficient cause for rejection of any or all bids.

   A. Minimum of five (5) years' experience in the manufacture of wood laboratory casework and equipment.

   B. Minimum of ten (10) completed installations of equal size and requirements, which can be inspected prior to award of contract.

   C. Financial and technical resources of sufficient scope to insure prompt and satisfactory performance in the production and delivery of all equipment specified.

   D. Financial and technical resources of sufficient scope to insure prompt and satisfactory installation and/or connection of the equipment when this work is part of the specified scope or a condition of purchase.

3. The owner reserves the right to reject the manufacturer or subcontractor proposed for this Section of Work if, such manufacturer or subcontractor cannot meet the requirements of these specifications or has a past record of poor performance. Rejected manufacturer shall be replaced by another whose product complies with the requirements of this specification.

4. Equipment inspection by the architect and owner at the equipment manufacturer's plant shall be required prior to shipment. Any equipment failing to meet with these specifications and approved shop drawings will be rejected. All rejected equipment must be promptly replaced at no cost to the owner.

1.02 QUALITY ASSURANCE

1. The prime intent of this specification, applicable drawings, and equipment schedule is to show and define the essential minimum requirements as to the quality of materials, construction, finish and overall workmanship to be supplied, thus providing an installed project that will be functional, provide long life with a minimum of maintenance and be operationally safe. Equipment differing from that specified or shown on the drawings cannot be considered unless ample proof is submitted with the proposal in the form of complete drawings and samples, indicating all essential requirements of the specifications are strictly adhered to.

2. The owner, or his designated representative, reserves the right to reject proposals offering equipment which do not meet the standard of quality established by these specifications. Any such decision will be considered final and not subject to further recourse.

1.03 DESCRIPTION OF WORK

1. Wood laboratory casework and equipment as specified herein and/or as scheduled, or as noted on the drawings is to be furnished, delivered, and installed in the location required by the drawings, and left ready for installation and connection of plumbing fixtures and electrical fixtures by others.

2. In general, casework, equipment, service fixtures and related work shall include:

   A. Furnishing, delivering to the building, uncrating, setting in place and leveling all casework and equipment listed in this specification or equipment schedule and/or shown on the drawings.

   B. Furnishing plumbing fixtures and fittings as defined in this specification, complete with tank nipples and lock nuts for mounting fixtures and fittings to tops or curbs. Fixtures shall be furnished assembled, tank nipples loose, in properly marked cartons for installation and final hook up or connection by others. Nipples for water (except deionized water) and gases to be brass.

   C. Furnishing electrical service fixtures directly attached to the casework or equipment as called for in this specification, equipment list and/or shown on the drawings. Fixtures shall be furnished assembled in properly marked cartons for installation and final hook up or connection by others. Duplex electric boxes located in cabinetry or aprons shall be installed at the factory by the equipment manufacturer.

   D. Furnishing of sink bowls and cupsinks, complete with required sink supports, overflows, and outlets with plugs and strainers, as called for in this specification, equipment schedule and/or shown on the drawings. Units shall be assembled and installed by casework contractor. Separate outlets shall not exceed four inches in length. Outlets shall be furnished less couplings or tailpieces required to connect to the drain piping system. Installation of outlets by others.

   E. Furnishing all service fixtures, fittings, remote control rods, escutcheon plates, valve handles and nipples. Service fixtures shall be furnished assembled in properly marked cartons for installation and final connection by others.

   G. Furnishing and installing countertops as shown on the drawings, of the size and shape required on all laboratory casework.

   H. Remove all debris, dirt and rubbish accumulated as a result of installation of this equipment, leaving premises broom clean and orderly.

   I. Final Adjustment: It is recognized that wood doors and drawers will swell and stick because of unusually high ambient moisture in new construction work. Casework installer shall during the first year return after final inspection to make any final adjustments to drawers and doors to eliminate sticking or other problems. Any doors or drawers, which cannot be corrected, shall be replaced.

1.04 DEFINITIONS:

1. Service fixtures are defined as gas, air and vacuum cocks; hot and cold water faucets; vacuum breakers and sinks. Service fixtures also include electrical convenience outlet boxes and single or multiple A.C. receptacles.

2. Service lines are defined as gas, air, vacuum, hot and cold water piping, fittings and shut-off valves necessary to carry respective services from rough-in outlets in the walls or floors to service fixtures. Service lines also include all conduits, junction boxes, conduit fittings and wire necessary to carry electrical services from building rough-in outlets in floors and walls to service fixtures.

3. “Others” are defined as separate and independent contractors who have no connection whatever with the casework and laboratory equipment mentioned in these specifications except to complete “Work by Others”.

1.05 RELATED WORK:

1. Mounting of service fixtures, installation of sink outlets, connections of service fixtures to rough-ins, duct work installation and materials required for same or to support same to be furnished and/or installed by others. See mechanical, electrical and plumbing portions of specifications.

2. Furnishing and installing of all reinforcements for wall, floors, and ceilings to adequately support or anchor laboratory equipment.

1.06 COORDINATING AND REFERENCES:

1. The work of this specification may require close coordination with the work of other sections of the specifications and/or the work of other trades to obtain the proper sequence of operations and installation of material.

2. Refer to drawings for locations of the various items. Check all drawings and equipment schedule to determine extent of work and special details.

1.07 SHOP DRAWINGS:

1. For approval by owner or architect and for job site use, furnish seven (7) sets of shop drawings showing plans, elevations and rough-ins of all items described in equipment schedule and/or shown on drawings. Provide revised drawings as required. Initial submittal of complete shop details must be submitted 60 days after award or casework supplier will be considered in default and subject to termination of contract or order.
2. Verify building measurements prior to fabrication and adjust casework accordingly to insure proper fit of all items. Casework manufacturer is to prepare all top details showing joint, hole, sink and other cutout locations.
3. Submit three (3) sets of as-built shop drawings including top details, special construction details and equipment schedules upon completion of project for owner's records.

1.08 SAMPLES: (As requested by owner or Architect)

1. Samples to be submitted to and approved by the owner or Architect before proceeding with any of the work. Submit full-size working samples clearly showing the following:
   A. Top construction-as specified.
   B. Drawer construction.
   C. Corner and leg construction.
   D. Cabinet construction.
   E. Door construction.
   F. Cabinet finishes.
   G. Hardware.
   H. Plumbing fixtures if other than called out on the Drawings.
   I. Sink construction-as specified.
2. Owner or architect will furnish contractor with sample approval in writing.

1.09 WARRANTY:

1. Furniture shall be provided with a 2 year Warranty covering materials and workmanship of product(s) furnished. Materials or components specified by the owner or architect by trade or brand name shall be warranted by the supplier to the extent of the manufacturer's warranty for such materials or components furnished.

PART 2 - WOOD AND LABORATORY FURNITURE:

2.01 GENERAL:

1. Casework shall be lipped design and be constructed in accordance with the best woodworking practices of the cabinet making industry. First class quality of casework shall be established by use of proper machinery and finishing procedures, tools, fixtures and skilled workmanship.
2. Units to incorporate blind mortised and tenoned type construction with all joints glued and screwed together, making each unit rigid and self-supporting. Doweled casework construction or face frame millwork type construction will not be accepted.
3. The following outlines minimum material and construction standards. Products meeting or exceeding these minimum standards will be acceptable.

2.02 MATERIALS:

1. Materials used for construction of cabinets, cases and tables shall be:
   A. All exposed solid wood parts shall be Northern grown red oak, clean and free from defects. All interior solid wood shall be sound hardwood. All lumber to be kiln dried to a uniform moisture content of 6 percent.

B. Oak,plywood shall be veneer core in thicknesses as specified, balanced construction, having face veneers not less than 1/28" in thickness. Exposed oak veneers shall be plain sliced (rotary cut not acceptable) selected for color - grade A-2. Semi-exposed and unexposed veneers shall be oak unselected for color. No particleboard will be acceptable for veneer cores except as core material in fully hardwood banded doors and leg panels.

C. Medium Density Fiberboard (MDF) is a fiberboard product made of softwood fibers compressed and cured under high temperature and pressure into a homogeneous stable panel with a density of 44 to 48 pounds per cubic foot. Panel thicknesses are obtained by a single pressing.

D. Tempered Hardboard is a panel manufactured from inter-felted lignocellulosic fibers, which are consolidated under heat and pressure in a hot press to a density of 50-55 pounds per cubic foot. Both sides of the panel are smooth. Panel face is comprised of a layer of more highly refined aspen wood fibers that provide a superior finishing surface. Surface and strength properties are further enhanced by the addition of a drying oil to both sides, which is subsequently baked. This “tempering” process provides improved surface, modulus of rupture, internal bond (PTS) and water properties. No formaldehyde binders are used in tempered hardboard panels.

E. Glass to be 1/8" or 7/32" thick float glass without imperfections and with unmarred surfaces. Safety glass, where called for, shall be 7/32" combination safety glass.

F. Glues shall be water resistant, with gluing done in presses, clamps and jigs.

2.03 CONSTRUCTION:

1. Base cabinets and case units to be of lipped style construction having drawer heads and hinged doors with radius edges, overlapping cabinet and case openings on all edges. Units shall be integral, completely factory assembled and finished. Cabinets constructed with flush interiors having no offsets, to maximize drawer and cupboard space and for ease of cleanability. Face frame constructed cabinets or cases, or cabinet construction featuring drawers which operate on side or bottom mounted slides, are not acceptable. Cabinets shall be constructed so that hinges fasten to solid lumber. Cabinets to be assembled using blind mortised and tenoned (or rabbeted) joints, glued and screwed together in accordance with the best cabinet makers’ methods. Cabinet or casework featuring pinned or doweled construction is not acceptable. All exposed joints shall be closely fitted and tight showing no open joints when cabinet in finished. All exposed corners rounded to a radius of at least 3/16".

2. Materials to be used for cabinet and case parts shall be:

   A. Solid Oak Hardwood:

      4 Exposed rails of top and intermediate frames.

      5 Facers (exposed edges) of finished ends, finished backs, unfinished ends, partitions, bottoms, and shelves.

      6 Glazed door frames, table aprons or rails, table legs, drawer heads, and case headers.

   B. Solid Hardwood:

      1. Internal cabinet frame members, cross rails in table aprons, drawer sides and backs, and corner blocks.

   C. Oak Plywood:

      1. Exposed ends, partitions, bottoms, backs and shelves. Doors and file drawer heads.

   D. Tempered Hardboard (fiber board):

      1. Unexposed cabinet and case backs, drawer bottoms, book compartment bottoms, and security panels.

3. Base Cabinet Construction:

   A. Exposed ends, 3/4" oak plywood with 3/4" wide x 1-1/4" thick oak facer.

      Unexposed ends, 5/8" birch or maple plywood with 3/4" wide x 1-1/4” thick oak facer.

Interior of sides machined for frame(s) and bottom, and bored for shelf support clips when required.

B. Top frames, 1" thick rectangular made of 4 pieces with center rail added on sections over 24" in length.

No part of cabinet frames to be less than 1-3/4" in width.

Frames assembled with tongue and grooved joints, with joints being glued together.

Ends of frames tenoned and bored for blind assembly with glue and reinforced with screws to cabinet walls. Depending upon cabinet style frames shall be grooved to receive partitions.

C. Bottoms, 3/4" thick plywood with 3/4" wide x 3/4" thick oak facer. Ends of bottoms tenoned and bored for blind assembly with glue and reinforced with screws to cabinet walls. Depending upon cabinet style bottoms shall be grooved to receive partitions.

D. Intermediate frames, 3/4" thick rectangular made of 4 pieces with center rail added on sections over 24" in length for added frame rigidity and to receive grooves for vertical partitions.

No part of cabinet frames to be less than 1-3/4" in width.

Frames assembled with tongue and grooved joints, with joints being glued together.

Ends of frames tenoned and bored for blind assembly with glue and reinforced with screws to cabinet walls. Depending upon cabinet style frames shall be grooved to receive partitions.

E. Partitions, 3/4" thick plywood with 3/4" wide x 3/4 " thick oak facer.

Partitions to be machined for frames and/or bored for shelf clips.

Top and bottom ends of partitions to be machined for assembly with glue and reinforced with screws into cabinet frames or bottoms.

F. Backs, 1/4" thick secured to cabinet ends, frames and/or partitions. When required for access to plumbing, backs shall be removable without the use of tools. All base units to be provided with backs.

Exposed finished backs on mobile, free standing or island units 3/4" thick faced on exposed edges with solid oak 3/4" wide x 3/8” thick. Units up to 8’ long requiring finished backs shall be provided with one-piece backs and shipped assembled to cabinets.

G. Shelves, 3/4" thick plywood faced with 3/4" wide x 3/4" thick oak facer.

Shelves shall mount on double-pinned nylon shelf clips adjustable on 1-1/4" centers fitting into bored holes in cabinet ends or partitions. Each clip has a rated 400-pound weight capacity.

H. Drawer heads (fronts), 13/16" thick solid oak secured to 1/2" thick solid hardwood (beech, maple or oak) drawer sides and backs.

Fronts secured to sides with interlocking lap joints and back fully grooved into sides. Joints glued and pinned. 1/4" bottoms shall be fully grooved into drawer fronts, sides and backs and secured with glue. Drawer heads over 8" in height may be furnished in 5-ply 13/16" thick lumber core plywood with sliced oak faces.

Drawers to fit into fully boxed or framed compartments providing top, bottom, and side guiding of drawers. Drawer guides subject to warpage, breakage and corrosion, and the use of drawer slides is not acceptable. Drawers provided with pulls and drawer stops as described under Hardware. Drawers over 24” wide to have 2 pulls and 2 stops.

I. Security panels, 1/4” thick tempered hardboard fully grooved into cabinet frames. Security panels provided between all drawers or drawers and cupboards having locks which are keyed differently.

J. Doors, 13/16" thick 5-ply hardwood framed having solid cores with hardwood cross bandings, and with oak veneered faces.

Paired cabinet doors to have matched grain pattern.

Doors shall be furnished with hinges, pulls and catches as described under Hardware.

K. Base cabinets have recessed toe space 4” high x 2-1/2” deep. Toe board made of 3/4” thick water-resistant plywood.

4. Wall, Upper, and Tall Case Construction:

A. Exposed ends for units 48" or less in height shall be 3/4" thick oak plywood with 3/4" wide x 1-1/4” thick oak facer. Exposed ends of units over 48" high shall be 1" thick oak plywood with 1" wide x 1-1/4” thick oak facer.

Unexposed ends for units 48" or less in height shall be 5/8" thick birch plywood with 3/4" wide x 1-1/4” thick oak facer. Unexposed ends for units over 48" high shall be 3/4" thick with 1" wide x 1-1/4” thick oak facer.

Interior of sides machined for top and bottom, and bored for shelf support clips.

B. Tops, 3/4" thick hardwood plywood furnished with oak header rail minimum 3/4" thick x 2-1/2" high. Header rail and tops tenoned and bored for blind assembly with glue and reinforced with screws to cabinet walls. (Case tops provided without header rails not acceptable.) Depending upon style of case, top shall further be provided with semi-concealed track located behind header to receive sliding doors.

C. Bottoms for hanging wall cases and counter mounted cases 1" thick hardwood plywood with 1" wide x 3/4" thick oak facer.

Floor mounted cases furnished with 3/4" thick plywood bottoms with 3/4" wide x 3/4" thick oak facer.

Ends of bottoms to be tenoned and bored for blind assembly with glue and reinforced with screws to cabinet walls.

Depending on style of cases, bottoms shall further be furnished with aluminum tracks to receive sliding doors.

D. Shelves, 3/4" thick plywood faced with 3/4" wide x 3/4" thick oak facer.

Shelves mount on double-pinned nylon shelf clips adjustable on 1-1/4" centers fitting into bored holes in cabinet ends or partitions.

E. Backs, 1/4" thick secured into unit ends, top, and bottom. Backs provided with 3/4" thick x 4" high batten strips behind case backs for reinforcement and through which hardware shall be attached, for securing cases to walls. Exposed backs on Island Units shall be 3/4" thick faced on exposed edges with solid oak 3/4" wide x 3/8” thick.

F. Tall storage cases to be provided with 4" high oak plywood toe rail set flush with face of case to provide added safety from tipping. Toe rail shall be reinforced for rigidity.

G. Hinged panel doors, minimum 13/16" thick up to 48" high and 1" thick over 48" high, 5-ply, hardwood framed, having solid cores with hardwood cross bandings and with oak veneered faces.

Paired case doors to have matched grain pattern.

Doors up to 48" high shall have 1 pair of hinges and 1 catch.

Doors over 48" high shall have 1-1/2 pair of hinges and 2 catches as described under Hardware.

H. Sliding panel doors of similar construction to hinged panel doors. Doors shall receive machined pulls recessed into door faces and operate on non-ferrous metal tracks. Doors up to 30" high shall be furnished with and operate on self-lubricating plastic slides. Doors over 30" high shall be furnished with and operate on ball bearing sheaves.

I. Hinged glazed doors, minimum 13/16" thick up to 48" high and 1-1/16" thick over 48" high. Glazed doors shall be made of solid hardwood (plywood not acceptable) with rails and styles tenoned, grooved and glued together with all joints reinforced with dowels. Doors over 65” high furnished with center rail.

Minimum width of all rail styles shall be 2-1/2".

Doors up to 48" high shall have 1 pair of hinges and 1 catch.

Doors over 48" high shall have 1-1/2 pair of hinges and 2 catches.

Glass shall be 1/8" double strength and set with wood molding.

Doors shall be furnished with hinges, pulls and catches as described under Hardware.

J. Sliding glazed doors, of similar construction to hinged glazed doors. Doors receive machined pulls recessed into door faces and operate on non-ferrous metal tracks. Doors up to 30" high shall be furnished with and operate on self-lubricating plastic slides. Doors over 30" high shall be furnished with and operate on ball bearing sheaves.

5. Table Frame Construction:

A. Table frames made of solid hardwood. Exposed table aprons minimum 3/4" thick x 4-3/4" high solid oak grooved for acceptance of cross rails and corner blocks and further grooved and drilled for attachment of top fasteners.

B. Reinforcing cross rails shall be solid hardwood, screwed and glued into front and back rails.

C. Table rail corner blocks, for attachment of legs, 3/4" thick x 4" high solid hardwood, screwed and glued into table aprons, or 13 gauge formed plated steel grooved and screwed into aprons.

D. Table legs, solid oak, minimum 2-1/4" square and furnished with specially designed bolt which passes through leg having exposed head conforming to corner rounding and furnished with washer and nut for secure attachment behind corner block.

Depending upon table type, legs shall be provided with leg shoes or adjustable glides, as described under Hardware.

E. Leg stretchers, where required, shall be not less than 1" x 3" mortised and tenoned into legs and secured with bolts.

Cross stretchers shall be of similar construction, tenoned into stretchers and secured with bolts.

F. Book compartment bottoms furnished in either 22 gauge black powder coated formed steel, tempered welded fiber, or birch or maple plywood depending on style of unit in which compartment occurs.

6. Cabinet, Case and Table Features:

A. Exposed edges and corners of cabinets, case walls, case bottoms, toe spaces, case tops, table aprons, table legs, table stretchers, finished backs, etc., shall be rounded minimum 3/16".

B. Joints between unfinished cabinet or case ends shall be chamfered, providing a neat V-joint when placed against cabinets that are joined together.

C. Fillers or scribes to be mounted flush with face of cabinet walls or ends. Fillers and scribes to be chamfered same as cabinet walls providing neat V-joint when placed against cabinet faces or walls.

D. Adjustable shelves shall have facers half rounded, providing no sharp corners.

E. Exposed or semi-exposed screw heads attaching panels or fillers shall be set flush with panel or cabinet surfaces.

F. Cabinet assemblies shall be pre-factory assembled as they are to be installed on job site, inspected for conformance to details and uniformity in workmanship and overall appearance. Units shall be properly marked for re-assembly on job site.

7. Cabinet Finish:

A. Prior to the application of wood finish, exposed cabinet and case parts shall be sanded smooth and loose fibers and dust removed.

B. Exposed cabinet and case parts then receive an application of stain. Excess stain shall be removed by wiping with wood wool and/or cloth, and parts shall be allowed to thoroughly dry.

C. After drying, exposed parts, cabinet and case interiors, drawers and doors shall receive a double coat of clear resinous wood sealer. Exposed cabinet parts, drawers, doors, and cupboard and case interiors shall then receive a double coat of clear, chemical resistant synthetic varnish. Between all applications of sealer and varnish, cabinet parts shall be lightly sanded and wiped. The resulting exterior finish shall be semi-gloss and provide and acid, alkali, solvent, water and abrasive-resistant surface. (Note: Interior of all cupboards and interior and exterior of all drawer bodies and tops of all cases shall be varnished having smooth surfaces.)

2.04 HARDWARE:

1. Drawer and door pulls are extruded, bar-type, dull finish aluminum 4-1/2" long and 1/2" wide overall. Each pull is held in place by two No. 10 flat head machine screws (washer head or pan head screws not acceptable) on 4" centers. Screw heads are countersunk. Pulls are provided on all hinged base cabinet doors and drawers, hanging wall cabinets and counter mounted cabinets requiring same for proper function.
2. Latching handles, dull chrome plated die cast zinc alloy approximately 4-1/4” in length in streamlined design. Handle operates with one-quarter turn. Paired door cases have latching handle on right door and dummy handle on left door. A 3-point latching system provides positive engagement at top and bottom of door with 5/16” diameter tapered epoxy coated steel rods engaging in case top and bottom and latch plate engaging behind left door or into side wall of case depending upon design. Latching handles are provided on all tall case doors over 48” high.
3. Hinges, butt style, 5-knuckle institutional type, of dull finished stainless steel, 2-1/2" by 3-1/8", unequal winged, tight pinned and with wing thickness of .081". Each hinge shall be secured by seven No. 7 flat head screws. Surface mounted hinges shall not be acceptable. Doors hung with paired hinges shall be capable of supporting 175 pounds at 12” from pivot point of hinges with no distortion of hinges or degradation of casework. Hinged doors up to 48” high furnished with 1 pair of hinges. Hinged doors over 48” high furnished with 1-1/2 pair of hinges.
4. Drawer stops are of non-corroding material and semi-automatic in design, to prevent accidental removal, but allow easy removal of drawers.
5. Shelf clips are double pin type made of nylon having anti-tipping seismic feature. Each clip is capable of supporting 400 pounds.
6. Catches for hinged doors are spring loaded, nylon roller type, designed for quiet operation. Cabinets with locked paired doors have elbow catches inside left-hand doors. Cabinet and case doors provided with 2 catches, one at top and one at bottom, where elbow catches are not furnished.
7. Base molding pliable black vinyl, 1/8" thick by 4" high with top edge rounded. Molding shall be secured with self-stick or applied waterproof adhesives. Formed stainless steel caps are fastened to exposed corners. Exposed cabinet work to be provided with base molding unless otherwise specified.
8. Leg shoes, molded black vinyl 2-1/2” high. Legs provided with shoes, also furnished with semi-concealed plated metal angle clips to secure legs to floor when desired.
9. Drawer and hinged door locks, except tall case doors, are dead bolt style, heavy-duty, five tumbler, of non-ferrous metal and master-keyed having 3/8" bolt throw and single bitted style keyway. Barrel and back plate of locks are riveted together; lock bolts shall be non-removable (locks with cams held in place with machine screws or nuts are not acceptable). Locks are secured to rear of drawer and door fronts with flat head screws.

   Each lock furnished with two non-ferrous keys.

   Locks furnished as indicated on details or as is standard with catalog descriptions unless otherwise specified.

   Latching handles shall be provided with locks where required. Locks shall be keyed to same master key as locks provided for drawer and hinged door cabinets.
10. Number plates are oval-shaped and made of non-ferrous metal with black numerals. Plates shall be secured with brads (self-stick number plates are not acceptable). Number plates furnished only as specified.
11. Glides, for table legs, are black nylon minimum 1-3/4" in diameter. Glides adjustable on 3/8" diameter x 1-1/2" plated stem.
12. Support rods shall be of 3/4" diameter aluminum with the upper ends rounded and the lower ends tapered to fit support rod plates. Support rod plates shall be made of aluminum secured into table top with heavy brass nut. Cross bars shall be made of hardwood, finished black and provided with wheel handle clamp screws which remain attached to cross bar when bar is removed. (3/4" diameter aluminum cross bar with rounded ends shall be furnished when so specified.)

2.05 COUNTERTOPS/LAB TOPS:

1. General:

A. Countertops constructed per specification covering particular type.

B. Except stainless steel and plastic laminate, tops having sinks provided with drip grooves cut into underside of exposed edges.

C. Adhesives or fasteners to be provided for securing of tops to cabinetwork; such materials to allow for contraction or expansion of tops where necessary.

D. Tops shall be 1" thick unless otherwise specified and provided with 4" high curbs where tops abut walls, columns, case ends, etc.

2. Types:

A. Epoxy resin tops are fabricated from a molded modified epoxy resin that has been especially compounded and cured to provide optimum physical and chemical resistance. Tops have a uniform mixture throughout, and do not depend on a surface coating that can be readily removed by chemical or physical abuse. Tops are non-glaring and black in color. All exposed edges shall be chamfered back approximately 1/8". Counters with integral curbs shall have a molded junction with a 3/4" radius, except around columns and special cutouts, which will have a standard applied mounted curb.

2.06 REAGENT AND UTILITY RACKS:

1. Reagent and Utility Racks, made of solid maple unless otherwise specified. Shelves to be a minimum 3/4" thick. When used for reagent storage, shelves shall be furnished with lips minimum 1/4" high and made of solid maple. Reagent rack standards made of solid maple minimum 1-1/4" thick. Reagent shelves and standards coated with a black acid, alkali and solvent resistant finish. Utility shelves and standards shall be finished natural or stained to match casework with a finish providing acid, alkali and solvent resistance.

2.07 SINKS:

1. Epoxy resin sinks, cupsinks and drain troughs, are cast of black modified epoxy resin having high resistance to chemicals, heat and shock as normally encountered in laboratories. Castings are done in permanent molds producing sinks, cupsinks and drain troughs with all inside corners coved and bottoms dished. Drain troughs, over 6’ in length, furnished in sections for assembly on job site. Sinks and drain troughs furnished with proper supports and caulking.

A. Epoxy resin sinks provided with 1-1/2" epoxy resin outlets.

B. Tailpieces, traps and drain lines to be furnished by Others unless otherwise noted on details or in equipment schedule.

2. Sinks shall be installed by Casework Contractor; Outlets to be installed by Others.

2.08 PLUMBING FIXTURES:

1. Plumbing fixtures furnished in laboratory grade chrome plated brass as manufactured by Water Saver Faucet Company, The Chicago Faucet Company, or T & S Brass Works.

A. Fixtures provided with brass tank nipples complete with locknuts and washers for attachment to countertops.

B. Water fixtures provided with inline vacuum breakers unless otherwise indicated.

C. Fixtures supplied assembled (tank nipples loose).

1. Pedestal electric boxes, cast aluminum finished in black textured coating furnished with tank nipples and locknuts for attachment to countertops.

A. Electrical boxes mounted in table or cabinet aprons shall be steel.

B. Electric receptacles, switches, etc., shall be specification grade 20 amp and UL approved. Receptacles located within 6’0” of sinks to be G.F.I. type.

C. Cover plates for receptacles shall be stainless steel.

D. Mounting of electric boxes in table aprons or cabinet units to be by Casework Manufacturer.

2.09 EMERGENCY SHOWER AND EYEWASH UNITS

1. General: Emergency shower and eyewash units shall be furnished and installed at point of use under this Section and connected to service piping systems under Division 15. Units shall meet the requirements of ANSI Standard Z358.1
2. Manufacturers: Water Saver Faucet Company or Chicago Faucet Company.
3. Emergency Showers:
   A. Deluge type with a push-paddle actuated control valve.
   B. Showerhead and flush ceiling collar shall be polished chrome plated. Maximum mounting height of showerhead shall be 96 inches.
   C. Valve shall be designed so that water flow remains on without requiring use of operator's hands.
   D. Chrome plate all exposed valves, piping and associated devices.
4. Deck Mounted Eye, Face and Body Spray Units;
   A. Dual pupose eyewash/drench hose unit.
   B. The angled dual head body, valve, squeeze handle, and deck flange shall be forged brass.
   C. Valve shall be self-closing with a locking clip to hold the valve open once the unit is activated.
   D. Provide unit with dual, rubber bound, angled, soft spray head; a polyurethane filter; an integral volume control; integral blackflow preventer; and a hinged stainless steel protective cover.
   E. Finish: Match laboratory service fitting finish.
   F. Provide a gray high pressure PVC hose.

2.11 STUDENT LAB TABLE

1. Student lab tables must accommodate computer technology. Work surface shall be fixed at 36" high with one unit per classroom being adjustable for ADA accessibility without altering the sink height or mechanical or electrical connections.
2. Work surface shall be equal to or similar to curvilinear shaped table as noted on the drawings. Work surface shall be cantilevered from steel understructure and supported by heavy-duty steel assembly.
3. Sink shall be one piece molded epoxy resin sink, mounted at a fixed height to comply with ADA Guidelines, and all piping under sink shall be enclosed with wood casework that allows wheelchair accessibility.
4. Supporting structure to be red oak, wood laboratory casework and configured as required to adequately support the work surface. Support structure shall be 2''11" x 24" d x 35" high.
5. Countertop shall be a minimum of 1" thick black molded epoxy resin with integral "Contura" edge and should accommodate wheelchair accessibility around entire perimeter of student work area with no obstructions.
6. Provide vandal resistant, solid cast brass combination cold water/gas fixtures (approved manufacturers include Chicago VRI Series and Unimix). Note: there is no gas hookup in the middle school labs for the student tables.
7. Provide two G.F.I. duplex electrical outlets.
8. One multi-outlet strip with surge protector.
9. Four clamp on upright rods with two cross arms and four connectors.
10. Upright rod assembly storage compartment.

2.12 TEACHER LAB STATION

1. Table shall be approximately 8'-0"x 31" x 34" high having an epoxy resin counter top equal to or similar to curvilinear shaped station as noted on the drawings.

2. Countertop shall have cutout slots for ease of cable management, and securing multi-media items within the understructure without disconnection from cable or power sources.
3. Storage on the instructor's side shall include a multi-media storage cabinet for a VCR, CPU, and laser disc player. Cabinet shall have access on two sides for cable management purposes
4. Center portion of unit shall be provided with a knee space accommodating a stool or wheel chair access.
5. Sink support cabinet end shall be provided with a full width drawer, space for all mechanical rough-ins and a removable panel for electrical outlets and multiple accessory port boxes.
6. Provide vandal resistant, solid cast brass combination cold water/gas fixtures (approved manufacturers include Chicago VRI Series and Unimix).
7. Sink shall be one piece molded epoxy resin sink.
8. Provide one set of clamp-on upright rods with two 90-degree connectors, and one horizontal cross bar.

2.13 MANUFACTURERS

1. Products: Subject to compliance with the requirements listed above, provide products manufactured by one of the following:
   A. Sheldon Lab
   B. Collegedale Casework, LLC
   C. Leonard Peterson

PART 3 - EXECUTION

3.1 EXAMINATION

1. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of plastic-laminate laboratory casework.

2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 GENERAL

1. For approval by owner or architect, within 60 days after receipt of order submit shop details showing floor plans, rough-ins and elevations of casework and equipment being supplied. Floor plans with rough-in details to be in 3/16" scale. Elevation drawings to be in 3/8" scale.

2. Prior to fabrication of casework field check project site to assure proper fit of materials being provided. Adjust drawings as necessary to insure proper fit of all casework and equipment to building conditions.

3. Deliver casework only after wet operations are complete and building is closed in, dry and has proper climate control for installation of casework.

   (Area in which laboratory casework is installed to be maintained between 65° and 75° F. with relative humidity maintained between 45% - 55%.)

   If these conditions are not met and maintained, product warranty is void.

4. Install casework in accordance to manufacturers recommended practice by qualified casework installer having a minimum of 3 years experience in the installation of institutional casework.

5. Adjust casework and hardware so that doors and drawers operate smoothly. Lubricate operating hardware as recommended by manufacturer.

2. Advise owner or contractor on procedures and precautions to be taken to protect casework and other materials installed from damage by work performed by other trades.

3. During installation keep job site clean and remove debris on a daily basis. Floors are to be broom cleaned upon completion.

3.3 INSTALLATION OF CABINETS/TABLES

1. Install level, plumb, and true; shim as required, using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.
2. Base Cabinets: Adjust top rails and subtops within 1/16 inch (1.5 mm) of a single plane. Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions with fasteners spaced not more than 24 inches (600 mm) o.c. Fasten adjacent cabinets together with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16 inch (1.5 mm).
3. Wall Cabinets: Adjust fronts and bottoms within 1/16 inch (1.5 mm) of a single plane. Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 24 inches (600 mm) o.c. Align similar adjoining doors to a tolerance of 1/16 inch (1.5 mm).
4. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.
5. Adjust laboratory casework and hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.

3.4 INSTALLATION OF COUNTERTOPS

1. Abut top and edge surfaces in one true plane with flush hairline joints and with internal supports placed to prevent deflection.

3.5 INSTALLATION OF ACCESSORIES

1. Install accessories according to Shop Drawings and manufacturer's written instructions.

3.6 CLEANING AND PROTECTING

1. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
2. Protect countertop surfaces during construction.

PART 4: EQUIPMENT SCHEDULE

4.1 General Notes:

1. All countertops shall be furnished in 1” black epoxy resin with applied 4” high curbs.
2. All sinks shall be furnished in epoxy resin with 1 ½” sink outlets. Sinks shall be set by casework installer.
3. All plumbing fixtures shall be furnished assembled for installation by plumbing contractor.
4. All safety shower and eyewash units shall be handicap accessible.
5. All cabinets shall be furnished with base molding with stainless steel corners.
6. All base cabinets, wall cabinets, and cases to be assembled using blind mortise and tenoned joints, glued and reinforced with screws.
7. All cabinet and case ends to be faced with solid lumber of size necessary for hinge attachment to same. Hinge attachment into plywood is not acceptable.

8. All drawer fronts, drawer sides and drawer backs to be made of solid lumber. Use of plywood is not acceptable. Exception – File Drawers.
9. All knee space aprons and table frames to be made of solid lumber. Use of plywood is not acceptable.
10. All hanging wall cases and all tall cases to be provided with top headers made of solid lumber (minimum 2 ½" high).
11. All shelves nosed with solid lumber (minimum ¾" x ¾").
12. All exposed cabinet edges, corners, bottoms and apron rails shall be rounded 3/16".
13. Provide locks on all drawers and doors on lab casework.

a. Casework Schedule

A. Provide Casework, lab tables and teacher demonstration tables as shown on floor plans, elevations and as indicated in the specifications.

END OF SECTION 12348

SECTION 12364 – DISPLAY CASEWORK

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. Recessed Trophy casework.

1.3 DEFINITIONS

A. Exposed Portions of Casework: Surfaces visible open cabinets or behind glass doors.

1. Ends of cabinets indicated to be installed directly against and completely concealed by walls or other cabinets after installation shall not be considered exposed.

B. Semiexposed Portions of Casework: Surfaces behind opaque doors, such as interiors of cabinets, shelves, dividers, interiors and sides of drawers, and interior faces of doors.

C. Concealed portions of casework include sleepers, web frames, dust panels, and other surfaces not usually visible after installation.

1.4 SUBMITTALS

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

B. Shop Drawings: For display casework. Include plans, elevations, sections, details, and attachments to other work.

1. Indicate locations of blocking and reinforcements required for installing display casework.
2. Indicate locations of and clearances from adjacent walls, doors, windows, and other building components.

C. Samples: Submit full-size working samples, for architect's approval, showing the following:

1. Cabinet construction.
2. Door construction.
3. Cabinet finishes.
4. Hardware.

D. Samples for Verification: Unless otherwise directed, approved Sample units in an undisturbed condition at time of Substantial Completion may become part of the completed Work. If not incorporated into the Work, retain acceptable Sample units at Project site and remove when directed by Architect.

1. One full-size, finished wall cabinet complete with hardware, doors, and adjustable shelves.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain display casework, including countertops, sinks, service fittings, and accessories, through one source from a single manufacturer.

B. Product Designations: Drawings indicate sizes and configurations of display casework by referencing designated manufacturer's catalog numbers. Other manufacturers' display casework of similar sizes, similar door and drawer configurations, and complying with the Specifications may be considered. Refer to Division 1 Section "Product Requirements."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install wood display casework until building is enclosed, wet work and utility roughing-in are complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.8 COORDINATION

A. Coordinate layout and installation of framing and reinforcements for support of wood display casework.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Wood Display Casework:

a. 370 Series Recessed Trophy Cases; Claridge Products and Equipment, Inc.
b. HDS Series Trophy Cases; Platinum Visual Systems (abc School Equipment, Inc.)

2.2 CABINET MATERIALS

A. Exposed Materials:

1. General: Provide materials that are selected and arranged for compatible grain and color. Do not use materials adjacent to one another that are noticeably dissimilar in color, grain, figure, or natural character markings.
2. Wood Species and Veneer Cut: Red oak, plain sliced/sawn.
3. Solid Wood: Clear hardwood lumber.
4. Plywood: Hardwood plywood; Grade A exposed faces at least 1/50 inch (0.5 mm) thick, Grade J crossbands, and backs of same species as faces.

B. Semiexposed Materials:

1. Solid Wood: Sound hardwood lumber, selected to eliminate appearance defects, of same species as exposed solid wood.

2. Plywood: Hardwood plywood of same species as exposed plywood. Semiexposed backs of plywood with exposed faces shall be same species as faces.

C. Concealed Materials:

1. Solid Wood: Any hardwood or softwood species, with no defects affecting strength or utility.
2. Plywood: Hardwood plywood. Concealed backs of plywood with exposed or semiexposed faces shall be same species as faces.

2.3 CABINET DESIGN

A. Size: Two 4’ x 8’ units as noted on drawings.

B. Aluminum front with satin anodized finish.

C. 3/16” tempered glass doors.

D. Three (3) 12” wide adjustable glass shelves with standard and brackets.

E. Oak finish back panels.

F. Fluorescent light with reflector.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of wood display casework.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF CABINETS

A. Install level, plumb, and true; shim as required, using concealed shims. Where display casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.

B. Install hardware uniformly and precisely.

C. Adjust display casework and hardware so doors operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.

3.3 INSTALLATION OF ACCESSORIES

A. Install accessories according to Shop Drawings and manufacturer's written instructions.

3.4 CLEANING AND PROTECTING

A. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

END OF SECTION 12364

SECTION 12610 - FIXED AUDIENCE SEATING

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 fixed audience seating with the following:

1. Self-rising seat mechanism.
2. Floor mounting.
3. Upholstered chairs.

1.3 SUBMITTALS

A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for fixed audience seating.

B. Shop Drawings: Plans, elevations, and sections through rows showing seating layout; row-lettering and chair-numbering scheme; chair widths; accessories, including locations of left and right tablet arms; accessibility provisions; aisle widths; and attachments to other Work.

C. Samples for Initial Selection: Manufacturer's color charts consisting of units or sections of units showing the full range of finishes, colors, textures, and patterns available for each exposed material.

D. Samples for Verification: For each type of exposed finish required, prepared on Samples of size indicated below and of same thickness and material indicated for the Work. If finishes involve normal color and texture variations, include sample sets showing the full range of variations expected.

1. Two-Seat Unit: Full size with finishes and accessories specified.

2. Upholstery Fabric: Full-width Sample, not less than 36 inches (900 mm) long, with fabric treatments applied. Show complete pattern repeat. Mark top and right side.
3. Molded Plastic: Manufacturer's standard-size unit, not less than 3 inches (75 mm) square.
4. Row-Letter and Chair-Number Plates: Full-size units with letters and numbers marked.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has specialized in installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.

B. Fire-Test-Response Characteristics of Upholstered Chairs: As follows:

1. Padding: Comply with California Technical Bulletin 117.

C. Source Limitations: Obtain each type of seating required, including accessories and mounting components, through one source from a single manufacturer.

1. Upholstery Fabric: Obtain fabric of a single dye lot for each color and pattern of fabric required.

D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not install seating until space is enclosed and weatherproof; wet work in space is complete and dry; finishes, including painting, are complete; and work above ceilings is complete. Do not install seating until ambient temperature and humidity conditions are continuously maintained at the levels anticipated for final occupancy.

B. Field Measurements: Verify seating layout by field measurements before seating fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating seating without field measurements. Coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 MATERIALS AND FINISHES

A. Steel: ASTM A 36/A 36M plates, shapes, and bars; ASTM A 570/A 570M hot-rolled sheet and strip; or ASTM A 620/A 620M cold-rolled sheet, finished with manufacturer's standard baked-on coating.

1. Color: As selected by Architect.

B. Cast Aluminum: ASTM B 179 aluminum to produce smooth die castings, finished with manufacturer's standard baked-on coating.

1. Color: As selected by Architect.

C. Concealed Plywood: HPVA HP-1 hardwood plywoodor DOC PS 1 softwood plywood, as standard with manufacturer.

D. Plastic Laminate: NEMA LD 3, HGS (General Purpose type, 0.048-inch (1.2-mm) nominal thickness).

1. Color and Pattern: As selected by Architect.

E. Fabric: Manufacturer's standard 100 percent nylon or 100 percent olefin.

1. Weight: 18 oz./linear yd. (0.56 kg/linear m)
2. Color and Pattern: As selected by Architect.

F. Upholstery Padding: Flexible, cellular, molded or slab polyurethane foam.

G. Molded Plastic: High-density polyethylene, blow or injection molded.

1. Color: As selected by Architect.

2.2 FIXED AUDIENCE SEATING

A. Products: Subject to compliance with requirements, provide one of the following:

1. Quattro; Hussey Seating Co.
2. Lancaster; KI, Inc.

B. Chair Mounting: As follows:

1. Pedestal: Floor attached
2. End Panels: Steel or Cast aluminum with design.

C. Fabric Upholstered Chairs: As follows:

1. Backs: As follows:

a. Padding Thickness: 2 inches (51 mm).
b. Rear Panel: Polypropylene back shroud

2. Seats: As follows:

a. Padding Thickness: Minimum 3 inches (76 mm) at front and rear edge.
b. Seat Underside: Polypropylene seat shroud

D. Back Pitch: Fixed.

E. Self-Rising Seat Mechanism: Gravity actuated, full fold.

F. Armrests: Plastic or thermoplastic.

G. Row-Letter and Chair-Number Plates: Manufacturer's standard.

H. Tablet Arms: Manufacturer's standard-size foldaway tablet arm with plastic-laminate writing surface over medium-density fiberboard or plywood core and with rounded, matching PVC edges; right-hand mounted, unless otherwise indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements, and other conditions affecting fixed audience seating. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install seating in locations indicated and fastened securely to substrates according to manufacturer's written installation instructions.

1. Use installation methods and fasteners that produce fixed audience seating assemblies with individual chairs capable of supporting an evenly distributed 600-lb (272-kg) static load without failure or other conditions that might impair the chair's usefulness.

B. Install seating with chair ends aligned from first to last row and with backs and seats varied in width to optimize sightlines.

C. Install chairs in curved rows at a smooth radius.

D. Install seating so moving components operate smoothly and quietly.

3.3 ADJUSTING

A. Adjust self-rising seat mechanisms so seats in each row are aligned when in upright position.

B. Repair minor abrasions and imperfections in finishes with coating that matches factory-applied finish.

C. Replace upholstery fabric damaged during installation.

END OF SECTION 12610

SECTION 14240 - HYDRAULIC ELEVATORS

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 hydraulic passenger elevators.

1.3 DEFINITIONS

A. Definitions in ASME A17.1 apply to work of this Section.

B. Defective Elevator Work: Operation or control system failure, including excessive malfunctions; performances below specified ratings; excessive wear; unusual deterioration or aging of materials or finishes; unsafe conditions; need for excessive maintenance; abnormal noise or vibration; and similar unusual, unexpected, and unsatisfactory conditions.

1.4 SUBMITTALS

A. Product Data: Include capacities, sizes, performances, operations, safety features, finishes, and similar information. Include product data for the following:

1. Car enclosures and hoistway entrances.
2. Operation, control, and signal systems.

B. Samples for Initial Selection: For finishes involving color selection.

C. Samples for Verification: For exposed finishes of cars, hoistway doors and frames, and signal equipment; 3-inch- (75-mm-) square Samples of sheet materials; and 4-inch (100-mm) lengths of running trim members.

D. Operation and Maintenance Data: For elevators to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in Division 1 Section "Operation and Maintenance Data," include diagnostic and repair information available to manufacturer's and Installer's maintenance personnel.

E. Inspection and Acceptance Certificates and Operating Permits: As required by authorities having jurisdiction for normal, unrestricted elevator use.

F. Warranty: Special warranty specified in this Section.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Elevator manufacturer or manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

B. Source Limitations: Obtain elevators, including electric traction passenger elevators specified in another Division 14 Section, through one source from a single manufacturer.

1. Provide major elevator components, including pump-and-tank units, plunger-cylinder assemblies, controllers, signal fixtures, door operators, car frames, cabs, and entrances, manufactured by a single manufacturer.

C. Regulatory Requirements: Comply with ASME A17.1 and elevator design requirements for earthquake loads in ASCE 7.

D. Accessibility Requirements: Comply with Section 4.10 in the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)."

E. Fire-Rated Hoistway Entrance Assemblies: Door and frame assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing at as close to neutral pressure as possible according to NFPA 252.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle materials, components and equipment in manufacturer's protective packaging.

B. Store materials, components, and equipment off of ground, under cover, and in a dry location. Handle according to manufacturer's written recommendations to prevent damage, deterioration, or soiling.

1.7 COORDINATION

A. Coordinate installation of sleeves, block outs, and items that are embedded in concrete or masonry for elevator equipment. Furnish templates and installation instructions and deliver to Project site in time for installation.

B. Furnish well casing and coordinate delivery with related excavation work.

C. Coordinate sequence of elevator installation with other work to avoid delaying the Work.

D. Coordinate locations and dimensions of other work relating to hydraulic elevators including pit ladders, sumps, and floor drains in pits; entrance subsills; and electrical service, electrical outlets, lights, and switches in pits and machine rooms.

1.8 WARRANTY

A. Special Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to repair, restore, or replace defective elevator work within specified warranty period.

1. Warranty Period: Two 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. KONE Inc.
2. Otis Elevator Co.
3. Schindler Elevator Corp.
4. ThyssenKrupp Elevator.

2.2 SYSTEMS AND COMPONENTS

A. General: Provide manufacturer's standard elevator systems. Where components are not otherwise indicated, provide standard components published by manufacturer as included in standard preengineered elevator systems and as required for complete system.

B. Pump Units: Positive-displacement type with a maximum of 10 percent variation between no load and full load and with minimum pulsations. Provide either of the following:

1. Pump, with fan-cooled squirrel-cage induction motor, mounted on oil tank with vibration isolation mounts. Enclose pump in prime-painted steel enclosure lined with 1-inch- (25-mm-) thick, glass-fiber insulation board.
2. Submersible pump, with submersible squirrel-cage induction motor, suspended inside oil tank from vibration isolation mounts.
3. Provide variable-voltage variable-frequency motor control.

C. Hydraulic Silencers: Provide hydraulic silencer containing pulsation-absorbing material in a blowout-proof housing at pump unit.

D. Piping: Provide size, type, and weight piping recommended by manufacturer, and provide flexible connectors to minimize sound and vibration transmissions from power unit.

1. Casing for Underground Piping: PVC pipe complying with ASTM D 1785, joined with PVC fittings complying with ASTM D 2466 and solvent cement complying with ASTM D 2564.

E. Hydraulic Fluid: Nontoxic, readily biodegradable, fire-resistant fluid made from vegetable oil with antioxidant, anticorrosive, antifoaming, and metal-passivating additives. Hydraulic fluid is approved by elevator manufacturer for use with elevator equipment.

1. Product: Subject to compliance with requirements, provide "Hydro Safe" by Hydro Safe Oil Division, Inc.

F. Inserts: Furnish required concrete and masonry inserts and similar anchorage devices for installing guide rails, machinery, and other components of elevator work where installation of devices is specified in another Section.

G. Car Frame and Platform: Welded steel units.

H. Guides: Provide either roller guides or sliding guides at top and bottom of car and counterweight frames. If sliding guides are used, provide guide-rail lubricators or polymer-coated, nonlubricated guides.

2.3 OPERATION SYSTEMS

A. Single-Car Auxiliary Operations: In addition to primary operation system features, provide the following operational features for elevators where indicated:

1. Battery-Powered Lowering: When power fails, car is lowered to the lowest floor, opens its doors, and shuts down. System includes rechargeable battery and automatic recharging system.

B. Security Features: Provide the following security features, where indicated. Security features shall not affect emergency firefighters' service.

1. Card-Reader Operation: System uses card readers at **car control stations and hall push-button stations** to authorize calls. Security system determines which landings and at what times calls require authorization by card reader. Provide required conductors in traveling cable and panel in machine room for interconnecting card readers, other security access system equipment, and elevator controllers. [

2.4 DOOR REOPENING DEVICES

A. Infrared Array: Provide door reopening devices with uniform array of 36 or more microprocessor-controlled, infrared light beams projecting across car entrance. Interruption of one or more of the light beams shall cause doors to stop and reopen.

2.5 FINISH MATERIALS

A. General: Provide the following materials for exposed parts of elevator car enclosures, car doors, hoistway entrance doors and frames, and signal equipment as indicated.

B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, commercial steel, Type B, exposed, matte finish.

C. Stainless-Steel Sheet: ASTM A 240/A 240M, Type 304.

D. Stainless-Steel Bars: ASTM A 276, Type 304.

E. Stainless-Steel Tubing: ASTM A 554, Grade MT 304.

F. Bronze Plate and Sheet: ASTM B 36/B 36M, Alloy UNS No. C28000 (muntz metal).

G. Bronze Extrusions: ASTM B 455, Alloy UNS No. C38500 (architectural bronze).

H. Bronze Tubing: ASTM B 135 (ASTM B 135M), Alloy UNS No. C23000 (red brass, 85 percent copper).

I. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), Alloy 6063.

J. Nickel Silver Extrusions: ASTM B 151/B 151M, Alloy UNS No. C74500 or No. C77600.

K. Plastic Laminate: High-pressure type complying with NEMA LD 3, Type HGS for flat applications.

2.6 CAR ENCLOSURES

A. General: Provide steel-framed car enclosures with nonremovable wall panels, access doors, power door operators, and ventilation.

1. Provide standard railings complying with ASME A17.1 on car tops where required by ASME A17.1.
2. Provide finished car including materials and finishes specified below.

B. Materials and Finishes: Provide manufacturer's standards, but not less than the following:

1. Subfloor: Underlayment grade, exterior plywood, 5/8-inch (16-mm) nominal thickness.
2. Floor Finish: As indicated in drawings.
3. Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to 1/2-inch (13-mm) fire-retardant-treated particleboard with plastic-laminate panel backing and manufacturer's standard protective edge trim. Panels have a flame-spread index of 25 or less, when tested according to ASTM E 84. Plastic-laminate color, texture, and pattern as selected by Architect from **elevator** manufacturer's full range.
4. Fabricate car with recesses and cutouts for signal equipment.
5. Fabricate car door frame integrally with front wall of car.
6. Stainless-Steel Doors: Flush, hollow-metal construction; fabricated from stainless-steel sheet or by laminating stainless-steel sheet to exposed faces and edges of enameled cold-rolled steel doors using adhesive that fully bonds metal to metal without telegraphing or oil-canning.
7. Sight Guards: Provide sight guards on car doors.
8. Sills: Extruded metal, with grooved surface, 1/4 inch (6.4 mm) thick.
9. Luminous Ceiling: Fluorescent light fixtures and ceiling panels of translucent acrylic or other permanent rigid plastic.
10. Handrails: Manufacturer's standard handrails, of shape, metal, and finish indicated.

2.7 HOISTWAY ENTRANCES

A. General: Provide manufacturer's standard horizontal-sliding, door-and-frame hoistway entrances complete with track systems, hardware, sills, and accessories. Provide frame size and profile to coordinate with hoistway wall construction.

B. Materials and Fabrication: Provide manufacturer's standards, but not less than the following:

1. Sight Guards: Provide sight guards on doors matching door edges.
2. Sills: Extruded metal, with grooved surface, 1/4 inch (6.4 mm) thick.
3. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107.

2.8 SIGNAL EQUIPMENT

A. General: Provide hall-call and car-call buttons that light when activated and remain lit until call has been fulfilled. Fabricate lighted elements with long-life incandescent lamps and acrylic or other permanent, nonyellowing translucent plastic diffusers or LEDs.

B. Car Control Stations: Provide manufacturer's standard recessed car control stations. Mount in return panel adjacent to car door, unless otherwise indicated.

1. Mark buttons and switches with standard identification for required use or function that complies with ASME A17.1. Use both tactile symbols and Braille.
2. Provide "No Smoking" sign matching car control station, either integral with car control station or mounted adjacent to it, with text and graphics as required by authorities having jurisdiction.

C. Emergency Communication System: Provide system that complies with ASME A17.1 and the U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities (ADAAG)." On activation, system dials preprogrammed number of monitoring station and identifies elevator location to monitoring station. System provides two-way voice communication without using a handset and provides visible signals that indicate when system has been activated and when monitoring station has responded. System is contained in flush-mounted cabinet, with identification, instructions for use, and battery backup power supply.

D. Firefighters' Two-Way Telephone Communication Service: Provide telephone jack in each car and required conductors in traveling cable for firefighters' two-way telephone communication service specified in Division 13 Section "Fire Alarm."

E. Car Position Indicator: Provide illuminated, digital-type car position indicator, located above car door or above car control station. Also provide audible signal to indicate to passengers that car is either stopping at or passing each of the floors served.

1. Include travel direction arrows if not provided in car control station.

F. Hall Push-Button Stations: Provide hall push-button stations at each landing as indicated.
1. Provide units with flat faceplate for mounting with body of unit recessed in wall.
2. Equip units with buttons for calling elevator and for indicating desired direction of travel.
3. Provide telephone jack in each unit for firefighters' two-way telephone communication service specified in Division 13 Section "Fire Alarm."

G. Hall Lanterns: Units with illuminated arrows; but provide single arrow at terminal landings. Provide the following:

1. Manufacturer's standard wall-mounted units, for mounting above entrance frames.

H. Hall Annunciator: With each hall lantern, provide audible signals indicating car arrival and direction of travel. Signals sound once for up and twice for down.

1. At manufacturer's option, audible signals may be placed oncar.

I. Hall Position Indicators: Provide illuminated, digital-display-type position indicators, located above hoistway entrance at ground floor. Provide units with flat faceplate for mounting and with body of unit recessed in wall.

J. Corridor Call Station Pictograph Signs: Provide signs matching hall push-button stations, with text and graphics as required by authorities having jurisdiction, indicating that in case of fire elevators are out of service and exits should be used instead. Provide one sign at each hall push-button station, unless otherwise indicated.

2.9 ELEVATORS

A. Elevator Description:
   1. Type: Holeless, beside-the-car, telescoping, single cylinder.
   2. Rated Load: 2100 lb (953 kg)
   3. Rated Speed: 100 fpm (0.51 m/s).
   4. Operation System: Single automatic operation.
   5. Auxiliary Operations:

      a. Battery-powered lowering.

   6. Security Features: Card-reader operation.
   7. Car Enclosures:

      a. Inside Width: 68 inches (1727 mm) from side wall to side wall.
      b. Inside Depth: 51 inches (1295 mm) from back wall to front wall (return panels).
      c. Inside Height: 94 inches (2388 mm) to underside of ceiling.
      d. Side and Rear Wall Panels: Plastic laminate.
      e. Reveals: Satin stainless steel, No. 4 finish
      f. Door Faces (Interior): Satin stainless steel, No. 4 finish.
      g. Door Sills: Nickel silver, polished.
      h. Ceiling: Luminous ceiling.
      i. Handrails: 1/2 by 2 inches (13 by 50 mm) rectangular satin stainless steel, No. 4 finish at sides and rear of car.
      j. Floor prepared to receive resilient tile (specified in Division 9 Section "Resilient Floor Tile").

   8. Hoistway Entrances:

      a. Width: 36 inches (914 mm)
      b. Height: 84 inches (2134 mm)
      c. Type: Single-speed side sliding
      d. Fire-Protection Rating: 1 hour

   9. Additional Requirements:

      a. Provide inspection certificate in each car, mounted under acrylic cover with frame made from satin stainless steel, No. 4 finish.
      b. Provide blanket hooks and one complete set(s) of full-height protective blankets.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elevator areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Verify critical dimensions and examine supporting structure and other conditions under which elevator work is to be installed.

   1. For the record, prepare a written report, endorsed by Installer, listing dimensional discrepancies and conditions detrimental to performance or indicating that dimensions and conditions were found to be satisfactory.
   2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install cylinder plumb and accurately centered for elevator car position and travel. Anchor securely in place, supported at pit floor and braced at intervals as needed to maintain alignment. Anchor cylinder guides at spacing needed to maintain alignment and avoid overstressing guides.

B. Welded Construction: Provide welded connections for installing elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.

C. Sound Isolation: Mount rotating and vibrating equipment on vibration-isolating mounts designed to effectively prevent transmission of vibrations to structure and thereby eliminate sources of structure-borne noise from elevator system.

D. Install piping above the floor, where possible. Where not possible, install underground piping in Schedule 40 PVC pipe casing assembled with solvent-cemented fittings.

E. Install piping above the floor, where possible. Where not possible, cover underground piping with permanent protective wrapping before backfilling.

F. Lubricate operating parts of systems as recommended by manufacturers.

G. Alignment: Coordinate installation of hoistway entrances with installation of elevator guide rails for accurate alignment of entrances with car. Where possible, delay installation of sills and frames until car is operable in shaft. Reduce clearances to minimum, safe, workable dimension at each landing.

H. Leveling Tolerance: 1/4 inch (6 mm), up or down, regardless of load and direction of travel.

I. Set sills flush with finished floor surface at landing. Fill space under sill solidly with nonshrink, nonmetallic grout.

J. Locate hall signal equipment for elevators as follows, unless otherwise indicated:

1. Place hall lanterns either above or beside each hoistway entrance.
2. Mount hall lanterns at a minimum of 72 inches (1829 mm) above finished floor.

3.3 FIELD QUALITY CONTROL

A. Acceptance Testing: On completion of elevator installation and before permitting use (either temporary or permanent) of elevators, perform acceptance tests as required and recommended by ASME A17.1 and by governing regulations and agencies.

B. Advise Owner, Architect, and authorities having jurisdiction in advance of dates and times tests are to be performed on elevators.

3.4 PROTECTION

A. Temporary Use: Comply with the following requirements for elevator used for construction purposes:

1. Provide car with temporary enclosure, either within finished car or in place of finished car, to protect finishes from damage.

2. Provide strippable protective film on entrance and car doors and frames.
3. Provide padded wood bumpers on entrance door frames covering jambs and frame faces.
4. Provide other protective coverings, barriers, devices, signs, and procedures as needed to protect elevator and elevator equipment.
5. Do not load elevators beyond their rated weight capacity.
6. Engage elevator Installer to provide full maintenance service. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as necessary for proper elevator operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.
7. Engage elevator Installer to restore damaged work, if any, so no evidence remains of correction. Return items that cannot be refinished in the field to the shop, make required repairs and refinish entire unit, or provide new units as required.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to operate elevator. Refer to Division 1 Section "Demonstration and Training."

B. Check operation of elevator with Owner's personnel present and before date of Substantial Completion. Determine that operation systems and devices are functioning properly.

C. Check operation of elevator with Owner's personnel present not more than one month before end of warranty period. Determine that operation systems and devices are functioning properly.

END OF SECTION 14240